Department for
Business, Energy
& Industrial Strategy

UK's Fourth Biennial Report

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

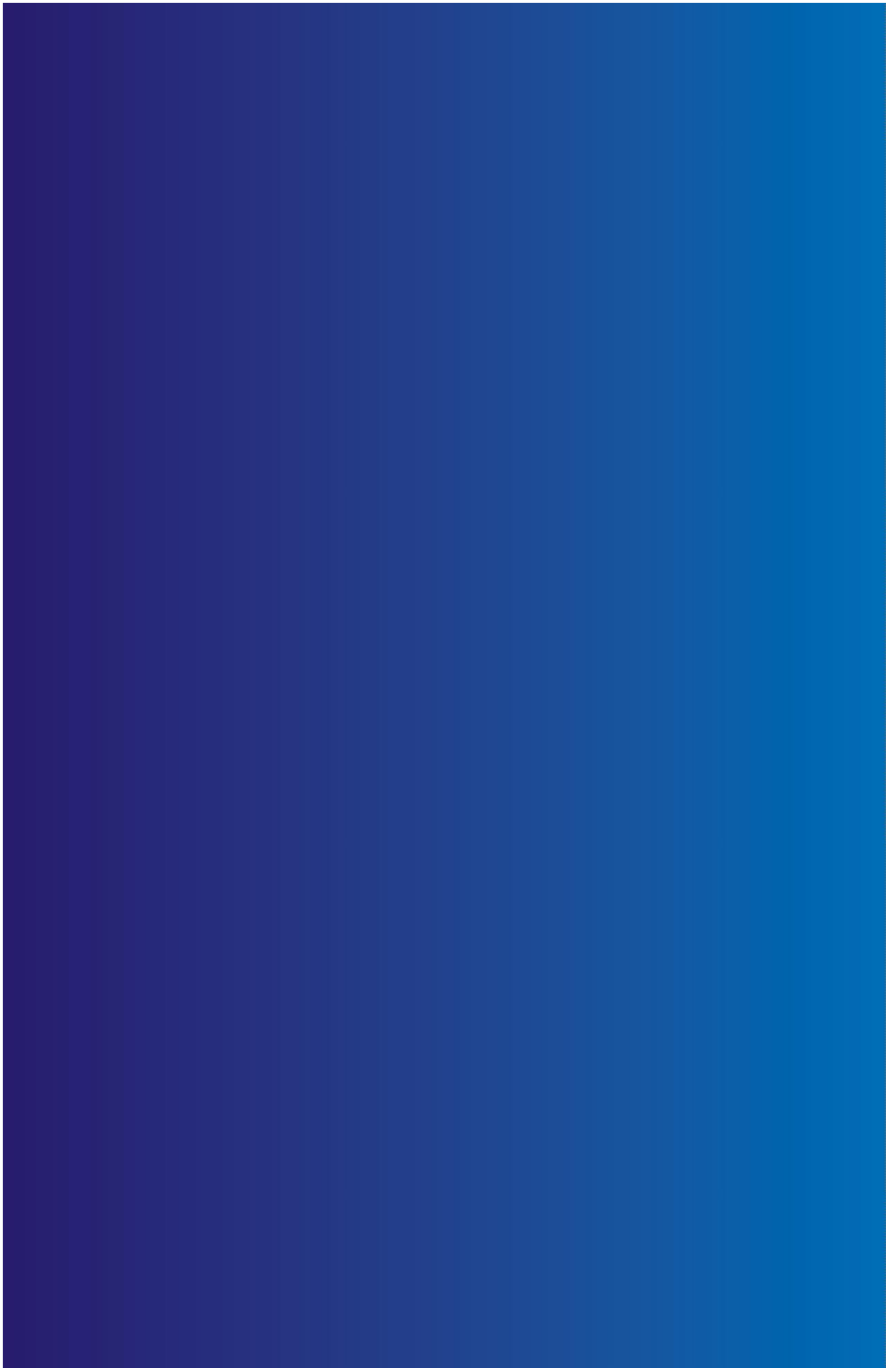
Contents

Acronyms

AAU	Assigned amount units
AEA	Annual Emission Allocations
AR	Assessment Report
BEIS	Department for Business, Energy and Industrial Strategy
BWT	Biological Waste Treatment
CCC	Committee on Climate Change
CCUS	Carbon capture, usage and storage
CDM	Clean Development Mechanism
CH_4	Methane
CIF	Climate Investment Funds
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP	Conference of the Parties
CRF	Common reporting formats
CTF	Common tabular format
DDM	Dynamic Dispatch Model
Defra	Department for Environment, Food and Rural Affairs
DfE	Department for Education
DFID	Department for International Development
DfT	Department for Transport
EEP	Energy and Emissions Projections
ESD	Effort Sharing Decision
ESMAP	Energy Sector Management Assistance Programme
ETS	Emissions Trading System
EUMM	European Union Monitoring Mechanism

FARPI	Food and Agricultural Policy Research Institute
FCO	Foreign and Commonwealth Office
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse gas
GVA	Gross value added
GWP	Global warming potential
HFC	Hydrofluorocarbon
IAR	International assessment and review
ICF	International climate finance
IDA	International Development Association
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land use, land use change and forestry
$MtCO_2e$	Mega tonnes of carbon dioxide equivalent
N_2O	Nitrous oxide
NAMA	Nationally Appropriate Mitigation Action
NAP	National Allocation Plan
NDC	Nationally Determined Contribution
NF_3	Nitrogen trifluoride
NICS	Northern Irish Civil Service
NIR	National inventory report
NISC	National Inventory Steering Committee
NMVOC	Non-Methane Volatile Organic Compounds
NOX	Nitrogen oxide
OBR	Office for Budget Responsibility
ODA	Overseas Development Aid
ODP	Outcomes Delivery Plan
OECD	Organisation for Economic Co-operation and Development
ONS	Office for National Statistics
PFC	Perfluorocarbon
PPCA	Powering Past Coal Alliance
REDD+	Reducing Emissions from Deforestation and Forest Degradation

SF_6	Sulphur hexafluoride
SO_2	Sulphur dioxide
UK PACT	UK Partnerships for Accelerating Climate Transitions
UNFCCC	United Nations Framework Convention on Climate Change
WAM	With Additional Measures
WEM	With Existing Measures



Ministerial Foreword

Rt Hon Andrea Leadsom MP
Secretary of State for Business, Energy and Industrial Strategy

Lord Duncan
Minister for Climate Change

We, Secretary of State Andrea Leadsom and Minister Lord Duncan, are proud to set out in this document the strong progress the UK has made in reducing our climate impact.

The science is clear about the speed, scale and cost to lives and livelihoods of the climate crisis we face, yet global emissions continue to rise year on year. Urgent global action is needed.

In the UK, we have cut emissions by 42% between 1990 and 2017, while growing the economy by more than two-thirds. We have reduced our use of coal in our electricity system from almost 40% to only 5% in just seven years, and we lead the world in the deployment of clean technologies such as offshore wind. Last year was the cleanest year for electricity ever in the UK, with low carbon sources contributing 53% of electricity generation.

The Paris Agreement requires the international community to keep the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. Following the landmark Intergovernmental Panel on Climate Change report on the impacts of global warming even of 1.5°C, the UK enshrined in legislation in June 2019 a commitment to meet net zero greenhouse gas emissions by 2050. In doing so we became the first major economy to set a date for ending our contribution to global warming.

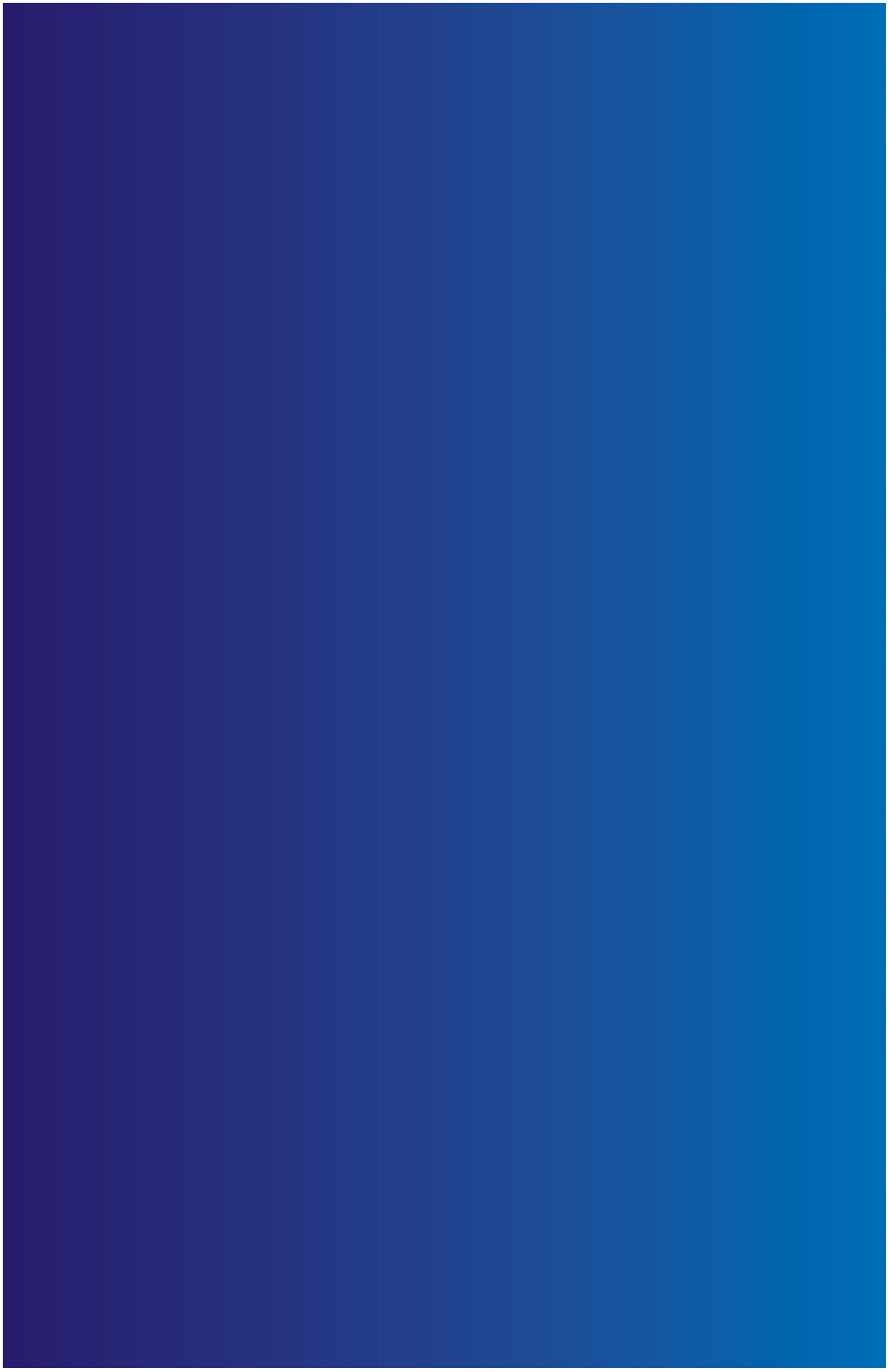
At the 2019 United Nations Climate Action Summit, the Prime Minister was clear that all countries must increase the ambition of their mitigation targets expressed through Nationally Determined Contributions and long-term strategies. To that end the UK will increase its international ambition ahead of COP26.

At that Summit, we also announced that we will double our International Climate Finance – from £5.8 billion to at least £11.6 billion from 2021-2025. This doubling will help us to support developing countries turn the tide against climate change and accelerate the shift from fossil fuels to clean energy, drawing on the UK's clean growth expertise. It will also help protect rainforests, restore degraded ecosystems and support the most vulnerable in dealing with the damaging effects of climate change.

We hope that other donors will take similar steps by setting out their post-2020 climate finance pledges as soon as possible.

The UK is honoured to have been nominated by our regional group to host COP26 in 2020, in partnership with Italy. The urgency of the challenge is clear. We will use the opportunity of hosting the COP26 negotiations to shine a spotlight on ambitious action by governments, businesses and people around the world, and to continue to drive greater global climate ambition.

Rt Hon Andrea Leadsom MP Lord Duncan



1. Introduction

Biennial Reports are submitted under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC) and under Article 7 of the Kyoto Protocol, in compliance with the obligations according to Decisions 2/CP.17 and 19/CP.18 of the Conference of the Parties (COP).

In 2010 the 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 review (IAR) and the UK's Fourth 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 guidelines for preparing common tabular formats (CTFs) were adopted during COP 18, under decision 19/CP.18. The report has been prepared in line with these guidelines.

1.1 Structure of the report

The report is structured as follows:

- **Chapter 2: Information on greenhouse gas (GHG) emissions and trends** presents information on the UK GHG inventory, covering emissions estimates for the period 1990-2017, and the national system established to produce and quality assure the UK GHG inventory;
- **Chapter 3: Quantified economy-wide emission reduction targets** presents the UK's quantified economy-wide emission reduction target, including any conditions or assumptions that are relevant to the attainment of that target;
- **Chapter 4: Progress in achievement of quantified economy-wide emission reduction targets** provides information on the UK's mitigation actions, including on the policies and measures implemented or plans to implement since its last Biennial Report to achieve the UK's economy-wide emission reduction target;
- **Chapter 5: Projections** reports on updated emission projections to 2035;
- **Chapter 6: Provision of financial, technological and capacity-building support to developing country Parties** details the UK's contributions to non-Annex I Parties consistent with the requirements of Biennial Reports;

- **Annex 1** contains CTF tables 1 to 6 supporting the UK's Fourth Biennial Report;
- **Annex 2** provides information on sectoral definitions and inclusion to facilitate understanding;
- **Annex 3** contains Global Warming Potential (GWP) values; and
- **Annex 4** presents summary tables for the UK's GHG inventory in 1990 and 2017 to facilitate understanding.

2. Information on GHG emissions and trends

2.1 Summary information

This chapter presents information on the UK GHG inventory, covering emissions estimates for the period 1990-2017, and the National System established to produce and quality assure the UK GHG inventory.

Total UK emissions decreased by around 42% between 1990 and 2017. 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.

2.2 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, to meet its commitments under the UNFCCC and the Kyoto Protocol. A concise summary of the National System is contained within this chapter. A more detailed summary can be found in the UK's National Inventory Report (NIR), submitted to the UNFCCC in 2019[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); and
- Nitrogen trifluoride (NF_3).

The direct GHGs have different impacts on the atmosphere and are therefore assigned a GWP. The GWP is a means of providing a simple measure of the relative effects various gases emissions when compared with CO_2, which has a GWP of 1. Once the GHG emissions are

[1] UK GHG Inventory, 1990–2017, Annual report for submission under the UN Framework Convention on Climate Change, April 2019 https://unfccc.int/documents/194909

converted into 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.

2.2.1 Kyoto Protocol

The Kyoto Protocol was adopted 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 fluorinated gases emissions 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 UK when reporting more generally to 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 3.

2.2.2 Coverage

Under the UNFCCC and the Kyoto Protocol first commitment period, the UK's Overseas Territories Gibraltar, Bermuda, Cayman Islands, and the Falkland Islands, and Crown Dependencies Guernsey, Jersey and the Isle of Man, are included. Emissions from each Overseas Territory and Crown Dependency are calculated individually and added to the UK total.

This chapter shows trends in UK GHG emissions between 1990 and 2017, disaggregating overall emissions by gas, 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, Scotland, Wales and Northern Ireland, and to the 391 local authorities that make up the UK[2].

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, 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.

2.2.3 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.

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[2] Local Authority is a designation of local government used in the United Kingdom.

The Department for Business, Energy and Industrial Strategy (BEIS) 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[3] 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 BEIS and reporting on BEIS' behalf.

BEIS 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 EU and the UNFCCC each year, as well as guiding the development of the inventory. NISC meets every April to agree what changes should be prioritised in the inventory in the coming year; and in November to discuss and approve changes that have been made and to scrutinise the effect on the inventory.

The inventory team in BEIS acts as chair. Many of the primary users of the data are represented, such as the Office for National Statistics; the Energy Emission Projections and Carbon Budgets teams in BEIS; representatives of the devolved administrations; and the Inventory Verification Programme run by Bristol University and the Met Office. In addition, there are the organisations that help to input into the inventory from the Inventory Agency Consortium, the Department for Food, Environment and Rural Affairs (Defra) and the Department for Transport (DfT). The NISC ensures that the data are scrutinised by those agencies that will be affected and concerns and queries can be raised.

Emissions estimates for 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 Defra, and emissions and removals in the LULUCF sector are produced on behalf of BEIS by the Centre for Ecology and Hydrology.

The GHG inventory is compiled annually according to the Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines[4]. Methodological improvements account for new data sources, updated guidance from the IPCC, relevant work by organisations such as the European inventory system for certain air pollutants, CORINAIR and specific research programmes sponsored by BEIS, Defra and 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;
- Inventory compilation;
- Managing all aspects of inventory quality assurance and quality control including the quality control of raw and processed data and data management tools;
- Documentation and archiving; and

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

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

- 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 European Union Monitoring Mechanism (EUMM), by the required deadline. 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 and the independent assessment report (IAR) process under the UNFCCC.

Data is collected on an annual basis from national statistics, industry, trade associations and 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, the UNFCCC, 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 EUMM. 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.

BEIS 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 through 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 improvement 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 quality assurance and quality control system, and the inventory improvement programme.

Compilation of the UK Crown Dependencies and Overseas Territories inventories is conducted by the Inventory Agency Consortium in parallel to the compilation of the UK inventory. This includes:

- Collecting and processing Crown Dependencies and Overseas Territories specific data. Activity data estimates are provided for individual Crown Dependencies and Overseas Territories by their respective government departments;
    - Selecting appropriate emissions factors and estimation methods according to IPCC guidance. In most cases, simpler methodologies are chosen for Crown

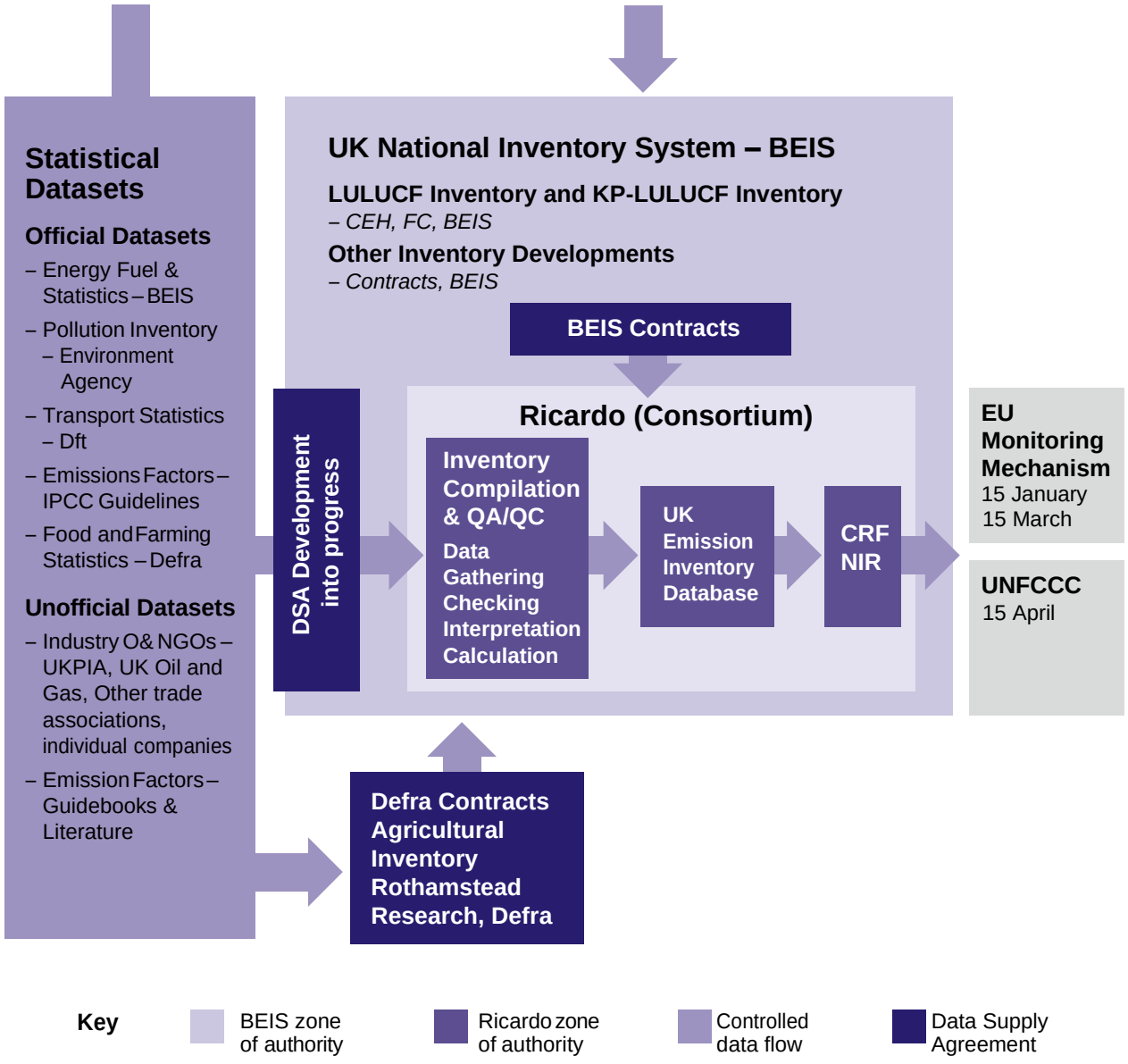
Dependencies and Overseas Territories. This is judged to be proportionate given their small contribution to the UK total;

- Inventory compilation into an integrated database which holds UK, Crown Dependencies and Overseas Territories data in a common format;
- Crown Dependencies and Overseas Territories specific management of inventory quality assurance and quality control;
- Documentation of Crown Dependencies and Overseas Territories methods and data sources in internal working documents and in the National Inventory Report (NIR), and archiving UK, Crown Dependencies and Overseas Territories data together.

Further detailed information on methods used for compiling the Crown Dependencies and Overseas Territories inventories may be found in the most recent UK NIR. These methods undergo improvement via the same improvement programme as the UK inventory. Crown Dependencies and Overseas Territories are not represented on the National Inventory Steering Committee (NISC) due to their small contribution to the UK total.

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 of the NIR.

Figure 1: Main elements for the preparation of the UK GHG inventory



2.2.4 Kyoto Protocol National Registry

The UK National Registry required for the Kyoto Protocol[5] is operated and maintained by the Environment Agency[6] on behalf of BEIS.

The National Registry conforms to the technical standards for data exchange between registry systems as outlined in the IAR[7]. 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 IARs along with results of test procedures.

Information on the registry is publicly available on the Environment Agency website[8]. Section 14 of the NIR contains further information on the changes in the National Registry.

2.2.5 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 3 purposes differs to some extent, because of the following:

- The UK's contribution under the first commitment period of the Kyoto Protocol extended coverage to emissions from the Crown Dependencies of Jersey, Guernsey and the Isle of Man, and the Overseas Territories that have ratified the Convention and Kyoto Protocol (the Cayman Islands, the Falkland Islands, Bermuda, and Gibraltar) – this is also the geographical coverage which is currently reported to the UNFCCC;
- The coverage under the second commitment period of the Kyoto Protocol is the same as under the first commitment period other than that it excludes Bermuda, which is not participating in this commitment period;
- The commitments under the EU's 2020 target only include the UK and Gibraltar, excluding all Crown Dependencies and other Overseas Territories; and
- The UK Climate Change Act (2008) applies only to the UK (see Chapters 3 and 4 for more information on the Act).

Table 1 shows the total GHG emissions estimates associated with the geographical coverages of the UK, Crown Dependencies and all Overseas Territories including net emissions and 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 2017 come from the UK GHG emissions statistics, published in February 2019.

2.2.6 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. Table 1 shows the emissions totals over time and how they break down between the UK, the Crown Dependencies and the Overseas Territories.

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5 UK national registry https://unionregistry.ec.europa.eu/euregistry/GB/index.xhtml

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

7 UNFCCC International Assessment Reviews https://unfccc.int/process/the-kyoto-protocol/registry-systems/independent-assessment-reports

8 Environment Agency https://www.gov.uk/government/organisations/environment-agency

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

	1990	1995	2000	2005	2010	2015	2016	2017
United Kingdom only	794.4	745.6	707.5	683.7	600.9	498.0	473.1	460.2
UK Crown Dependencies	1.7	1.8	1.9	1.7	1.7	1.6	1.6	1.6
Overseas Territories (including Gibraltar)	1.7	1.8	1.9	2.1	2.1	2.3	2.1	2.1
Aviation and shipping between UK and Overseas Territories	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3
Aviation and shipping between Crown Dependencies and Overseas Territories*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flights between UK and Crown Dependencies	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2
Shipping between UK and Crown Dependencies*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	798.2	749.6	711.8	688.1	605.3	502.3	477.2	464.5
Change from 1990	0.0%	-6.1%	-10.8%	-13.8%	-24.2%	-37.1%	-40.2%	-41.8%

*Values are rounded to the nearest 0.1. Values <0.05 are shown as 0.0.

Source: 1990-2017 final UK GHG emissions statistics[9]

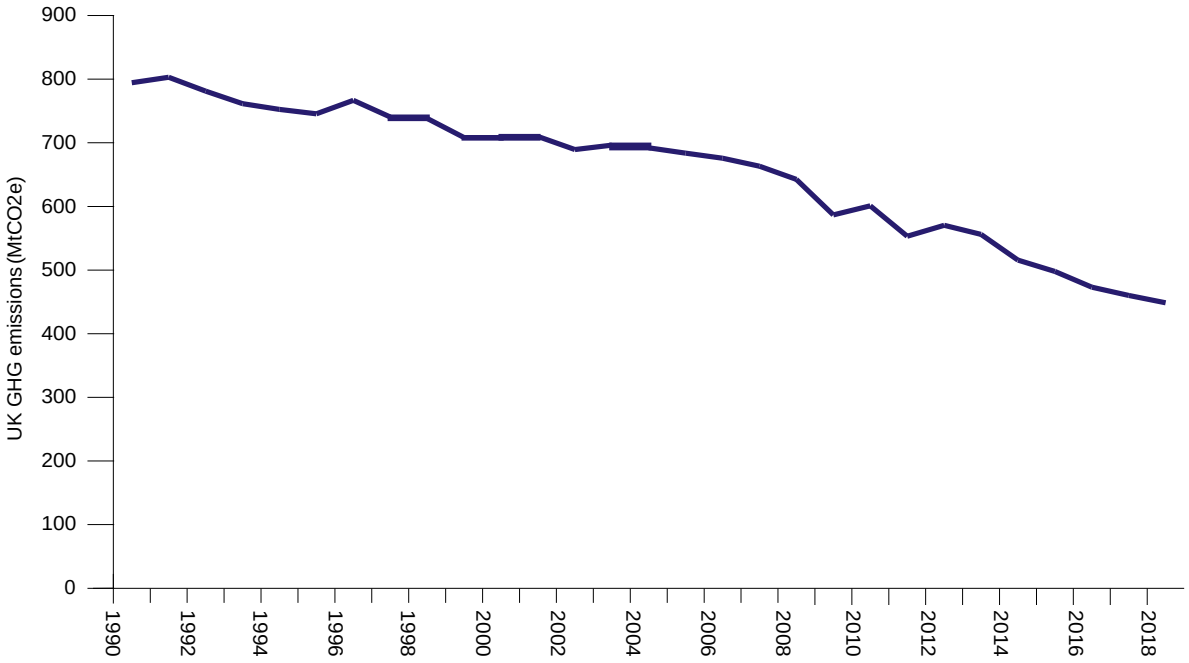
2.3 GHG emissions trends

As shown in Table 1, total emissions decreased by around 42% between 1990 and 2017. The full time series can be viewed in Annex 1, Table 1. The fluctuations in emissions between 2009 and 2012 are due to a number of one-off effects in the series – namely the 2008 recession, 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 2017 for the basket of seven GHGs covered by the Kyoto Protocol. They have fallen by approximately 42% over this period. This reduction has been driven by 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.

9 Final UK GHG emissions statistics https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017

Figure 2: UK emissions of GHGs, 1990–2017, $MtCO_2e$



Source: Final UK GHG Emissions Statistics

Information on individual gases is contained in sections below and Annex 1, Table 1 contains information summarising the UK's GHG emissions. More details can be found in the UK's annual GHG inventory, published in February 2019[10].

24 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 Crown Dependencies and Overseas Territories. 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 2: UK GHG emissions (UNFCCC coverage), $MtCO_2e$

Gas	1990	1995	2000	2005	2010	2015	2016	2017
Net CO_2 emissions (emissions minus removals)	599.5	563.4	561.9	561.5	502.0	411.9	389.3	376.8
Methane (CH_4)	133.0	126.4	108.9	87.4	64.3	53.1	51.5	51.9
Nitrous oxide (N_2O)	48.4	38.7	28.6	24.5	21.5	20.4	20.3	20.7
Hydrofluorocarbons (HFC)	14.4	19.1	9.9	13.1	16.5	16.0	15.2	14.2
Perfluorocarbons (PFC)	1.7	0.6	0.6	0.4	0.3	0.3	0.4	0.4
Sulphur hexafluoride (SF_6)	1.3	1.3	1.8	1.1	0.7	0.5	0.5	0.5
Nitrogen trifluoride (NF_3)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total GHG emissions	798.2	749.6	711.8	688.1	605.3	502.3	477.2	464.5

*Values are rounded to the nearest 0.1. Values <0.05 are shown as 0.0.

Note: The Base Year for UNFCCC purposes is 1990

Source: 1990-2017 GBR CRF tables[11]

10 Final UK GHG emissions statistics https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017

11 UNFCCC 1990-2017 Great Britain CRF tables https://unfccc.int/documents/194910

The sections that follow summarise the main factors affecting historical trends by gas. Percentages and data quoted in these sections refer to the full UNFCCC geographical coverage unless otherwise specified. Table 1 in Annex 1 provide more detailed data available for all years from 1990-2017.

2.4.1 Carbon dioxide

CO_2 was the largest share of UK GHG emissions in 2017, making up 81% of the inventory. Net CO_2 emissions in 1990, defined as all anthropogenic sources minus removals by sinks, were estimated to be 599.5 mega tonnes of CO_2e ($MtCO_2e$), or an estimated 75% of the UK's total emissions of GHGs. By 2017, CO_2 emissions estimates had been reduced by 37% to 376.8 $MtCO_2e$.

The main source of CO_2 is from combustion of fossil fuels, primarily from the transport sub-sector. This overtook energy supply as the UK's largest emitting sector in 2016. Power station emissions have contributed the most to decreases in CO_2 by an estimated 130.6 $MtCO_2e$ 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.

2.4.2 Methane

CH_4 is the second largest share of the UK's GHG emissions by gas. Estimated emissions of CH_4 in 1990 were 133.0 $MtCO_2e$, contributing an estimated 17% of the UK's total emissions of GHGs. By 2017 CH_4 emissions estimates had been reduced by 61% to 51.9 $MtCO_2e$, contributing an estimated 11% 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, and leakage of natural gas from the distribution network. The overall trend in CH_4 emissions is a relatively steady decline driven by a large reduction in landfill and coal mining emissions, though the rate of decline has slowed in recent years. 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.

2.4.3 Nitrous oxide

In 1990, N_2O emissions contributed 48.4 $MtCO_2e$, or an estimated 6%, of the UK's total GHG emissions. By 2017 N_2O emissions estimates had been reduced by approximately 57% to 20.7 $MtCO_2e$, contributing an estimated 4% 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 2017 is agricultural soils, accounting for an estimated 55% of total N_2O emissions. Agricultural soil emissions have declined by an estimated 16% since 1990 due to improvements in farm management practices.

2.4.4 Hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride

Emissions of the fluorinated or industrial gases (F gases) are small in absolute terms, but their significance is increased by high GWP values (see Annex 1, 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 F gases totalled 15.1 $MtCO_2e$ in 2017, making up 3% of total emissions. Since 1995 the overall decrease in their emissions has been an estimated 28%, due mainly to the fall in emissions from F gas manufacture, to the installation of abatement equipment at two of the three manufacturers, and to plant closures. Emissions in 2017 were 13% below 1990 when emissions were 17.3 $MtCO_2e$. The majority of F gas emissions in 2017 were from refrigeration and air conditioning, which have increased significantly since 1990 as HFCs replaced ozone depleting substances which were previously used as refrigerants.

HFC emissions were 14.2 $MtCO_2e$ in 2017. This was only 1% lower than the level of HFCs in 1990. Emissions from industrial processes have been offset by greater use in refrigeration and air conditioning to replace other ozone depleting substances, although these are beginning to be phased out. Since 1995 HFC emissions have reduced by 26%, and HFCs made up 99% of all F gas emissions in 2017.

The largest contribution to this sector in 2017 arises from refrigeration and air conditioning equipment, which in 2017 contributed an estimated 82% to the overall emissions of HFCs. Emissions 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 12% 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 metered dose inhalers.

Perfluorinated compound emissions have declined by an estimated 38% since 1995 and 78% since 1990, to 0.4 $MtCO_2e$ in 2017. The main sources of perfluorinated compound emissions in 2017 were electronic equipment and the production of halocarbons.

The use of SF_6 has most commonly been in magnesium foundries and high voltage switch gear. The level of SF_6 emissions has always been small. In 2017 this level was 0.5 $MtCO_2e$, 60% lower than in 1990. In 2017 the main emissions source was insulation and arc quenching of electrical equipment, making up 54% of SF_6 emissions.

Emissions from NF_3 are small, around 531 tCO_2e, which is estimated to be a small increase from 1990 levels at around 415 tCO_2e. Emissions from this gas are seen in the electronics industry.

25 Sectoral emissions

Table 3 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 1990-2017.

Table 3: UK GHG emissions by source sector (UNFCCC coverage), $MtCO_2e$

	1990	1995	2000	2005	2010	2015	2016	2017
1. Energy	615.3	573.0	566.0	562.5	507.8	416.1	394.6	381.8
Of which: A.3. Transport	122.5	125.2	130.3	133.6	122.0	122.1	124.6	124.6
2. Industrial processes and product use	66.6	60.9	40.6	39.7	35.6	33.7	30.9	30.3
3. Agriculture	49.2	48.0	45.9	43.6	40.9	41.2	41.2	41.5
4. LULUCF	0.3	-1.7	-3.9	-7.1	-9.1	-9.7	-9.8	-9.9
5. Waste	66.9	69.5	63.2	49.4	30.1	21.0	20.4	20.7
6. Other *(as specified in summary 1.A)*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (net emissions)	798.2	749.6	711.8	688.1	605.3	502.3	477.2	464.5

Source: 1990-2017 GBR CRF tables[12]

Energy was responsible for an estimated 381.8 $MtCO_2e$ or 82% of net GHG emissions in 2017. Energy emissions have fallen by 38% since 1990. Just over a quarter of energy emissions in 2017 were from the energy industry, which has seen a 56% decrease in emissions between 1990 and 2017. The restructuring of the electricity supply industry in the 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 a corresponding switching from gas to coal, but there has been a large fall since then, particularly in recent years, as coal has largely been phased out.

Emissions data by individual years are available in Annex 1. 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.

2.5.1 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 27% of UK GHG emissions in 2017, representing a reduction of 2% since 1990. Road transport is the most significant source of emissions in this sector, with emissions from passenger cars heavily influencing 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.

2.5.2 Energy sub-sectors: other sectors

A further 235 $MtCO_2e$ or 48% of end-use emissions reductions were seen in other areas of the energy sector. Over three quarters of the emissions in this category in 2017 came from fuel combustion for domestic uses such as heating, cooking, and garden machinery. Since 1990 emissions from domestic combustion have fallen by 42%. 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.

2.5.3 Agriculture

The agriculture sector includes emissions from livestock and agricultural soils. There are also small amounts of emissions of CO_2 from the breakdown of pesticides. In 2017, end-user GHG emissions from agriculture were estimated to be 41.5 $MtCO_2e$ or 9% of total UK GHG emissions. This is a decrease of 16% since 1990 estimates of GHG emissions in this sector, when emissions were estimated to be 49.2 $MtCO_2e$.

2.5.4 Land use, land use change and forestry

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 1991. The size of the net sink has increased over time, from -0.3 $MtCO_2e$ in 1991 to -9.9 $MtCO_2e$ in 2017. 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 25% since 1990. Net removals from grassland have increased by 24% since 1990 (i.e. more CO_2 has been drawn down by grassland).

2.5.5 Industrial processes and product use

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 54% 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.

2.5.6 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 69% 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. There has also been more diversion away from landfills in response to the UK landfill tax and policies to meet the requirements of the EU Landfill Directive.

2.5.7 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 are expressed as a 95% confidence interval and are summarised in Table 4.

Estimated emissions of CO_2, which dominate GWP weighted emissions, have a low uncertainty of around 3%. There are much larger uncertainties associated with emissions of other gases. The LULUCF, waste management and agriculture sectors are the sectors with the highest uncertainty.

Table 4: Summary of Monte Carlo uncertainty estimates 1990-2017 (UNFCCC coverage)

	GWP[2]	1990 emissions[3] (thousand tonnes CO_2 equivalent)	2017 emissions[3] (thousand tonnes CO_2 equivalent)	Uncertainty[4] in 2017 emissions	Range of uncertainty in 2017 emissions 2.5 percentile	Range of uncertainty in 2017 emissions 97.5 percentile	Percentage change between 1990 and 2017	Range of likely % change between 1990 and 2017[5] 2.5 percentile	Range of likely % change between 1990 and 2017[5] 97.5 percentile
Carbon dioxide[6]	1	599,366	376,722	3%	365,720	387,399	-37%	-39%	-36%
Methane	25	133,145	51,927	17%	44,414	61,752	-60%	-70%	-50%
Nitrous oxide	298	48,331	20,680	18%	17,585	24,828	-56%	-70%	-42%
HFCs	12 – 14,800	14,394	14,197	9%	12,883	15,490	-1%	-17%	19%
PFCs	7,390 – 17,340	1,652	372	24%	291	469	-77%	-82%	-72%
SF_6	22,800	1,305	525	12%	465	586	-60%	-66%	-53%
Nitrogen trifluoride	17,200	0.4	0.5	47%	0.3	0.8	36%	-34%	153%
All GHGs weighted by GWP		798,192	464,424	3%	450,386	479,248	-42%	-45%	-39%

Source: 1990-2017 final UK GHG emissions statistics[10]

Notes:

1. 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.
2. The GWP (Global Warming Potential) of a GHG measures its effectiveness in global warming over 100 years relative to carbon dioxide. The GWPs used in these statistics are from Working Group 1 of the IPCC Fourth Assessment Report: Climate Change 2007.
3. 1990 and 2017 estimates, and the percentage change, are presented as the central estimate from the model. These differ from the actual emissions estimates.
4. Expressed as a percentage relative to the mean value 2017 emissions. Calculated as 0.5*R/E where R is the difference between 2.5 and 97.5 percentiles and E is the mean.
5. Equivalent to a 95 per cent probability that the percentage change between 1990 and 2017 is between the 2 values shown. Values include uncertainties for Overseas Territories data.
6. CO_2 emissions are net emissions. Total emissions minus removals.

The table demonstrates the estimated uncertainties by GHG, as well as overall uncertainty on total UK GHG emissions, which is 3% in 2017. 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 21 $MtCO_2e$, the uncertainty analysis resulted in a 95% confidence interval of 18 to 25 $MtCO_2e$ in 2017.

The likely percentage change between 1990 and 2017 lies between -39% and -45%, with a central estimate of -42%. 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.

2.6 Changes since the last Biennial Report

Since the publication of the UK's Third Biennial Report in December 2017[12], 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 5 below. Further information about changes to the inventory can be found in the NIR.

Table 5: Selection of major revisions to the UK GHG inventory since publication of the third Biennial Report

Change	Effect on Inventory
Revision to upstream oil and gas combustion estimates, and method change for Energy from Waste plant using revised UK energy statistics	1.3% increase to emissions estimates from energy industries
New installation data for upstream oil and gas fugitive estimates	1.4% increase to emissions estimates from fugitive emissions
Revisions to natural gas use in off-road material	0.5% increase to emissions estimates from manufacturing industries and construction
Revision to the UK demand figure for petroleum coke in the UK energy statistics	48% increase in emissions from non-energy products from fuel and solvent use
Revision to all shipping gas oil and fuel oil activity data and emission factors	5% increase to transport emissions
Reconciliation of harvest volume and forest age data	157% decrease in emissions from harvested wood products

Source: UK GHG Inventory Annual Report for Submission[1]. A full list of revisions can be found therein in tables 10.1-10.15.

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

2.7 Indirect GHGs

The indirect GHGs emitted in significant volumes in the UK consist of nitrogen oxides (NO_X), carbon monoxide (CO), Non-Methane 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 6 shows emissions from these gases since 1990.

Table 6: Indirect GHG emissions ($ktCO_2e$)

	1990	1995	2000	2005	2010	2015	2016	2017
NO_X	3093.4	2541.7	1990.7	1753.5	1247.2	1017.8	917.5	888.7
CO	7370.6	6127.8	4191.5	3053.4	2048.0	1704.8	1581.0	1559.1
NMVOC	2841.4	2241.9	1591.2	1165.0	879.6	814.8	800.8	809.0
SO_2	3781.1	2466.7	1300.6	781.4	454.6	255.1	179.2	177.2

Source: UNFCCC 1990-2017 GBR CRF tables[12]

Total emissions of CO in 2017 were 1,559 $ktCO_2e$, and since 1990, emissions have decreased by 79%. 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.

[12] The Third Biennial Report was published in Annex 1 of the UK's Seventh National Communication https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i

In 2017, total emissions of NO_X were 889 $ktCO_2e$, and since 1990, emissions have decreased by 70%. 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 2017 were 177 $ttCO_2e$, and since 1990 emissions have decreased by 95%. The reductions arise mainly from the energy supply sector due to the increase in the proportion of electricity generated by combined cycle gas turbine stations which are more efficient than conventional coal and oil stations and have negligible SO_2 emissions.

NMVOCs total emissions for 2017 were 809 $ktCO_2e$, and since 1990, overall emissions have decreased by 72%. 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.

2.8 Quality assurance and 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 GHG inventory 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, such as BEIS, the Office for National Statistics and the British Geological Survey, qualify as the UK's National Statistical Agencies and abide by strict statistical quality assurance and quality control standards. Other organisations, such as the Centre for Ecology and Hydrology, which provides the LULUCF estimates, and the Environment Agency, which provides regulated point source emissions data, supply important datasets for the inventory and have their own quality assurance and quality control systems.

Whilst these organisations have their own quality assurance and quality control systems, Ricardo Energy & Environment is responsible for co-ordinating inventory wide quality assurance and quality control 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 quality assurance and quality control that comply with either IPCC Good Practice Guidance or the UK's Official Statistics standards.

The inventory has a developed quality assurance and quality control 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 quality assurance and quality control 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 quality assurance and quality control 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 quality assurance (review) and quality control (checking) activities and to different roles within the compilation and reporting process. A quality assurance and quality control manager co-ordinates all quality assurance and quality control activities. The quality assurance and quality control plan is maintained by the inventory's quality assurance and quality control manager.

The plan defines the specific quality objectives and quality assurance and quality control 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 quality assurance and quality control activities.

To verify the emissions levels and trends reported in the GHG inventory, BEIS 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 BEIS' GHG inventory verification programme: Angus Tower, Angus, Scotland; Tacolneston Head, Norfolk; and Ridge Hill, 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.

3. Quantified economy-wide emission reduction target

3.1 Introduction

The UK has committed to both international and domestic emission reduction targets. The UK Climate Change Act (2008) established the world's first legally binding framework for national emission reduction targets. The UK's carbon budgets are legally binding limits on the total amount of GHG that the UK can emit for a given five-year period.

As an EU Member State, the UK participates in the EU's Convention pledge to the UNFCCC to reduce GHG emissions by 20% by 2020 compared to 1990 levels[13]. The UK is also jointly committed to a similar target[14] under the Doha Amendment to the Kyoto Protocol[15]. To reach this target, an effort sharing agreement distributes the effort required amongst EU member states[16].

The Paris Agreement entered into force on 4 November 2016 and was ratified by the UK on 18 November 2016. Parties to the Paris Agreement are required to prepare, communicate and maintain successive Nationally Determined Contributions (NDCs). In 2015, the EU published its NDC for the period 2021 to 2030. This commits the EU and its Member States, including the UK, to at least a 40% reduction in domestic GHG emissions by 2030 compared to 1990 levels.

Once the UK has left the EU, it will have its own NDC. This is without prejudice to future relationship negotiations on climate with the EU. The UK will increase its international ambition ahead of COP26.

3.2 Domestic targets

In 2008, the UK Climate Change Act established the world's first long-term legally binding framework to reduce GHG emissions, committing the UK to reducing its emissions by at least 80% below the 1990 baseline level by 2050[17].

In June 2019, the Act was amended to commit the UK to achieving a net zero GHG target by 2050. The UK was the first major economy to enshrine such a commitment in law. This followed the publication of the IPCC's special report on global warming of 1.5°C in October 2018, after which the UK Government commissioned the Committee on Climate Change

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13 EU 2020 Convention pledge (2011) https://unfccc.int/resource/docs/2011/sb/eng/inf01r01.pdf

14 Doha Amendment https://unfccc.int/files/kyoto_protocol/application/pdf/kp_doha_amendment_english.pdf. This amendment has not yet come into force.

15 Doha Amendment: https://unfccc.int/files/kyoto_protocol/application/pdf/kp_doha_amendment_english.pdf. This amendment has not yet come into force.

16 Decision No 406/2009/EC https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009D0406

17 UK Climate Change Act 2008 http://www.legislation.gov.uk/ukpga/2008/27/contents

(CCC) to provide advice on the implications of the Paris Agreement for the UK's long-term emissions reduction targets[18]. In May 2019, the CCC recommended that the UK legislate as soon as possible to reach net zero GHG emissions by 2050.

3.2.1 Carbon budgets

The UK Climate Change Act also introduced carbon budgets, which cap emissions over successive five-year periods and must be set 12 years in advance. The first five carbon budgets cover the period from 2008-32, with the sixth carbon budget due to be set by mid-2021. The Act also established the CCC – the independent statutory body that advises the UK Government on climate change mitigation and adaptation, including emissions targets. 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 share of the EU Emissions Trading System (ETS) limit for the relevant period; and
- Non-traded sector, which covers everything else, for example road transport, agriculture and buildings.

To calculate UK performance against the carbon budgets, data is taken from the UK GHG Inventory. These include emissions from LULUCF. The data are then adjusted to take into account removals of emissions from the atmosphere by carbon sinks associated with LULUCF activity. More information on how the UK monitors progress on these targets can be found in Chapter 2. The result of this calculation gives net UK emissions, which are further adjusted to account for:

- Carbon units which have been bought in from overseas by government and others to offset UK emissions ("credits"), thereby reducing the net UK carbon account; and
- UK carbon units that have been sold to a third party outside the UK or otherwise disposed of ("debits"), which increase the net UK carbon account as the recipient can use these units to offset their own emissions and it would lead to double counting if they were also used to offset UK emissions.

The traded sector of the UK's net account is the same as the UK's share of the EU ETS cap. The detailed rules for these calculations are contained in the Carbon Accounting Regulations 2009. International aviation and shipping emissions are not currently included within the first five carbon budgets. These carbon budgets limit GHG emissions as set out in Table 7 and Figure 3[19].

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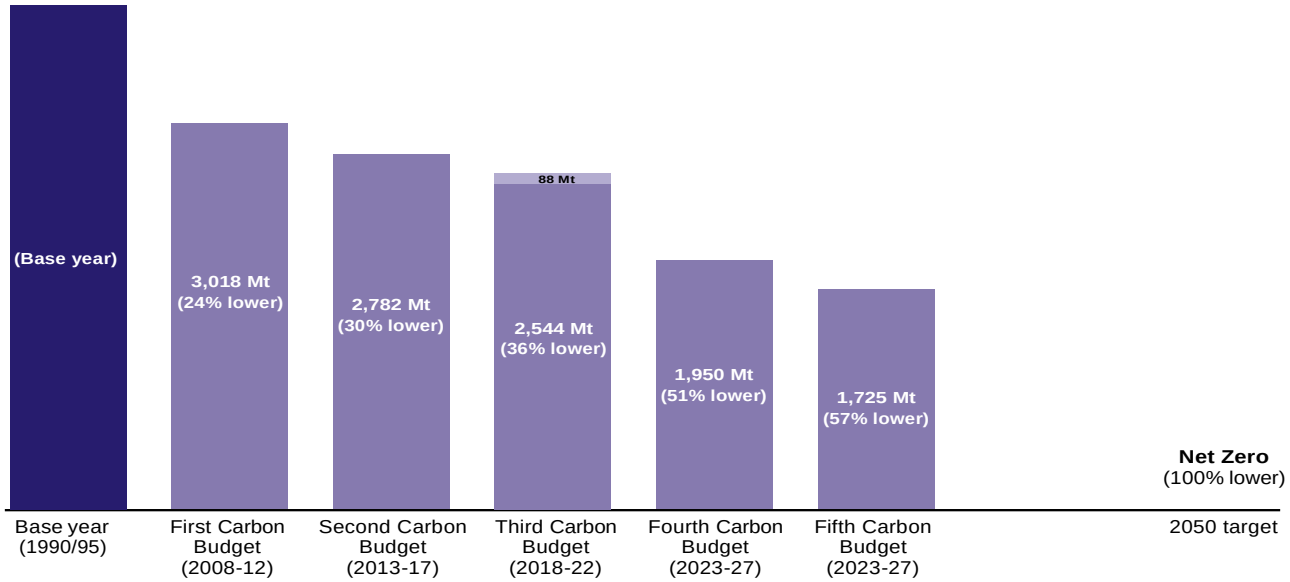
18 UK Committee on Climate Change, Net Zero – The UK's contribution to stopping global warming (2019) https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

19 BEIS guidance, UK legislation for carbon budgets https://www.gov.uk/guidance/carbon-budgets.

Table 7: Carbon budget levels 2008-2032

Carbon budget periods	CB1 (2008-12)	CB2 (2013-17)	CB3 (2018-22)	CB4 (2023-27)	CB5 (2028-32)
Carbon budget level ($MtCO_2e$)	3,018	2,782	2,544	1,950	1,725
of which traded	1,233	1,078	985	690	590
of which non-traded	1,785	1,704	1,559	1,260	1,135

Figure 3: UK carbon budgets and 2050 target



Notes: Base year emissions are revised each year, so the percentage reductions against carbon budgets are subject to change. The UK has carried forward 88Mt of overperformance from the second carbon budget, which changes the third carbon budget level to 2,632Mt (equivalent to a 34% reduction on base year emissions). However, the UK has no intention of using this overperformance to meet the third carbon budget – it will act solely as a contingency against changes in the base year emissions and will be released once it is clear that it will not be needed.

The base year for carbon budgets 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 due to improvements in inventory methodology.

The geographical coverage of these targets comprises UK territory only (England, Wales, Scotland and Northern Ireland) and not the UK's Crown Dependencies or Overseas Territories.

The UK Climate Change Act permits the UK to use 'flexibilities', such as surplus from previous carbon budgets or the purchase of good quality international carbon credits, to meet carbon budgets. Before using flexibilities, the Government must obtain and take into account the advice of the CCC and consult the devolved administrations. As of October 2019, the UK has not used international market-based mechanisms to achieve carbon budgets.

Five carbon budgets have been set to date, putting in place caps on GHG emissions from 2008 out to 2032. The Government anticipates receiving advice from the CCC on the level of the sixth carbon budget (2033-2037) in late 2020, and the Government is legally required to set that budget by June 2021.

Details about the UK's progress against carbon budgets can be found in Chapter 4.

3.3 International targets

Under both the EU's Convention pledge to the UNFCCC and the Doha Amendment to the Kyoto Protocol, the EU and its Member States are jointly committed to achieving a 20% reduction of GHG emissions from 1990 levels by 2020.

3.3.1 EU 2020 Climate and Energy Package and the Kyoto Protocol

In 2009 the EU established sub-targets through the 2020 climate and energy package[20], which underpins the implementation of the 2020 target under the Convention. A 20% reduction of total GHG emissions from 1990 levels is equivalent to a 14% reduction compared to 2005 levels. This 14% reduction objective is divided between the Emissions Trading System (ETS) and Effort Sharing Decision (ESD) sectors. These two sub-targets are:

- A 21% reduction in emissions from sectors covered by the EU ETS compared to 2005 levels, which includes emissions from the power and industrial sectors, and since 2012 has included international aviation within the European Economic Area; and
- Around 10% reduction from ESD sectors compared to 2005, including buildings, agriculture, waste and transport not covered by the EU ETS.

The ESD target is distributed between Member States to reflect national circumstances, requirements for economic growth and scope for further emissions reductions. Each member state has a national emission target for non-ETS sectors for 2020, which have been translated into binding quantified Annual Emission Allocations (AEAs) for the period 2013–2020.

Under the second commitment period of the Kyoto Protocol 2013 to 2020, the EU has a collective target to reduce its emissions by 20% relative to 1990 levels by 2020. Member State emissions from the traded sector are managed centrally by the Union and are not counted towards individual Member State targets, as set out in the EU's joint fulfilment agreement for the Doha Amendment. Therefore, only the ESD sectors and a subset of LULUCF emissions are counted towards EU Member State targets under the second commitment period of the Kyoto Protocol.

The UK's share of the target under the Kyoto Protocol is discussed below. Table 8 illustrates the distinction between EU and UK international targets for 2020. All 2020 targets have been set using Global Warming Potential values from the IPCC's fourth Assessment Report (AR4).

3.3.2 UK targets under the Effort Sharing Directive and Kyoto Protocol

Under the ESD, the UK has a target of reducing its total emissions to 16% below the 2005 level by 2020 for non-ETS sectors. The UK's Annual Emission Allocations were initially calculated[21], and subsequently adjusted[22], to follow a declining path from 358.7 $MtCO_2e$ in 2013, to 327.1 $MtCO_2e$ in 2020, giving an allocated emission level for the entire commitment period of 2,743.4 $MtCO_2e$. However, the AEAs for 2017-2020 were further adjusted in 2017 following the application of new guidelines for national GHG inventory reporting, leading to a revised total of 2,830.5 $MtCO_2e$.[23] [24]

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20 EU 2020 Climate and Energy Package https://ec.europa.eu/clima/policies/strategies/2020_en

21 European Commission Decision 2013/162/EU https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D0162

22 Initial AEA calculations were revised in Commission Decision 2013/634/EU due to changes in the scope of the EU ETS: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D0634

23 European Commission Decision (EU) 2017/1471 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2017.209.01.0053.01.ENG

24 Updated ESD allocations for the UK http://ec.europa.eu/environment/ets/esdAllocations.do?languageCode=en&esdRegistry=GB&esdYear=&search=Search&currentSortSettings=esdRegistry+ASC&resultList.currentPageNumber=1

The initial allocated emissions total for the non-ETS sectors in the UK (2,743.4 $MtCO_2e$) was used to calculate the UK's Assigned Amount for the second commitment period of the Kyoto Protocol. The calculation of the UK's Assigned Amount is set out in UK's Initial Report for the second commitment period, and results in an Assigned Amount of 2,744,937,332 assigned amount units (AAUs) where one AAU is equivalent to one tCO_2e[25].

For the Kyoto Protocol, the UK's base year for assessing CO_2, CH_4, and N_2O emissions is 1990, and 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 Kyoto Protocol.

Table 8a,b Comparison of EU and UK international emissions targets for 2020. See text below on the main differences in geographical, aviation and LULUCF coverage.

a) EU targets

Target	EU target under the Convention	EU target under the Kyoto Protocol (CP2)	EU 2020 Climate and Energy Package
Target year or period	2020	2020 (Second commitment period 2013-2020)	2013-2020
Emission target	20% reduction on base year levels	20% reduction on base year levels	ESD (non-traded) sectors: 10% reduction on 2005 levels EU ETS (traded) sector: 21% reduction on 2005 levels
Base year	1990	1990, but subject to flexibility rules. 1995 or 2000 may be used as base year for F-gases or nitrogen trifluoride (NF_3).	1990 for overall emission reduction target; 2005 for targets broken down into ETS and non-ETS emissions.
Aviation and shipping	Aviation in the scope of the EU ETS included. In practice total outgoing flight emissions considered. Domestic shipping included. International shipping excluded.	Domestic aviation included. International aviation excluded. Domestic shipping included. International shipping excluded.	ESD sectors: aviation and international shipping excluded, domestic shipping included. EU ETS sector: domestic aviation and aviation within the EEA included, shipping excluded.
Gases covered	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3	ESD sectors: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 EU ETS sector: CO_2, N_2O, CF_4 and C_2F_6
Sectors included	Energy (including Transport), Industrial Processes and Product Use, agriculture, waste, aviation in the scope of the EU ETS.	Annex A of Kyoto Protocol (Energy including Transport, Industrial Processes and Product Use, agriculture, waste), LULUCF according to Kyoto Protocol accounting rules for CP2.	ESD: Transport (except aviation), buildings, non-ETS industry, agriculture (except forestry) and waste. EU ETS: Power & heat generation, energy-intensive industry sectors, aviation (Annex 1 of ETS directive).
GWPs used	IPCC AR4	IPCC AR4	IPCC AR4

[25] UK Kyoto Protocol Initial Report for the second commitment period (2017) https://unfccc.int/files/national_reports/initial_reports_under_the_kyoto_protocol/second_commitment_period_2013-2020/application/zip/gbk-cp2-ir-29aug2017.zip

b) UK targets

Target	UK target under EU ESD (ESD)	UK target under the Kyoto Protocol (CP2)
Target year or period	2013-2020	2020 (Second commitment period 2013-2020)[26]
Emission target	16% reduction on 2005 emission levels for non-ETS sectors (excluding LULUCF)	2,744,937,332 AAUs over commitment period; 20% reduction on base year levels by 2020, jointly fulfilled with EU.
Base year	2005. Base year estimate for UK's ESD emissions is 415.6 $MtCO_2e$.[27]	1990 for CO_2, CH_4 and N_2O, 1995 for F-gases. UK's base year estimate of the reported Kyoto basket of greenhouse gases for the second commitment period is 803.2 $MtCO_2e$.[28]
Geographical coverage	UK + Gibraltar	UK and UK Crown Dependencies and Overseas Territories (excluding Bermuda)
Aviation and shipping	Aviation and international shipping excluded. Domestic shipping included.	Domestic aviation included. International aviation excluded. Domestic shipping included. International shipping excluded.
Gases covered	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3
Sectors included	Transport (except aviation), buildings, non-ETS industry, agriculture (except forestry) and waste. Excludes LULUCF.	Reported: Annex A of Kyoto Protocol (Energy including Transport, Industrial Processes and Product Use, agriculture, waste), LULUCF according to Kyoto Protocol accounting rules for CP2. Included in UK target: ESD sectors and KP-LULUCF.
GWPs used	IPCC AR4	IPCC AR4

3.3.3 UK targets under the EU ETS and Kyoto Protocol

The EU ETS was established in 2003 by Directive 2003/87/EC and is the largest ETS in the world. It is currently in Phase III (2013-2020). 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 Phase III cap reduces the number of available allowances by 1.74% each year to deliver an overall reduction of 21% below 2005 verified emissions by 2020.

For 2017, the UK notional cap for stationary operators was 164,402,030 tCO_2eq, of which 136,800,098 units were surrendered by UK operators[29]. For information on the UK's EU ETS net trading position, see Chapter 4 on progress in achievement of emission reduction targets.

3.3.4 Coverage differences targets and IPCC reporting requirements

The scope of UK GHG emissions varies according to the differing requirements under the EU targets and the Kyoto Protocol (Table 8b), and the IPCC coverage for reporting under the Convention. For aviation, the scope of the EU ETS is largely additional to the IPCC inventory and the Kyoto Protocol coverage, 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'. Domestic aviation and shipping within the UK are included within all targets and coverages

[26] The Doha Amendment, stating the targets for the Second Commitment Period of the Kyoto Protocol, has not yet come into force.

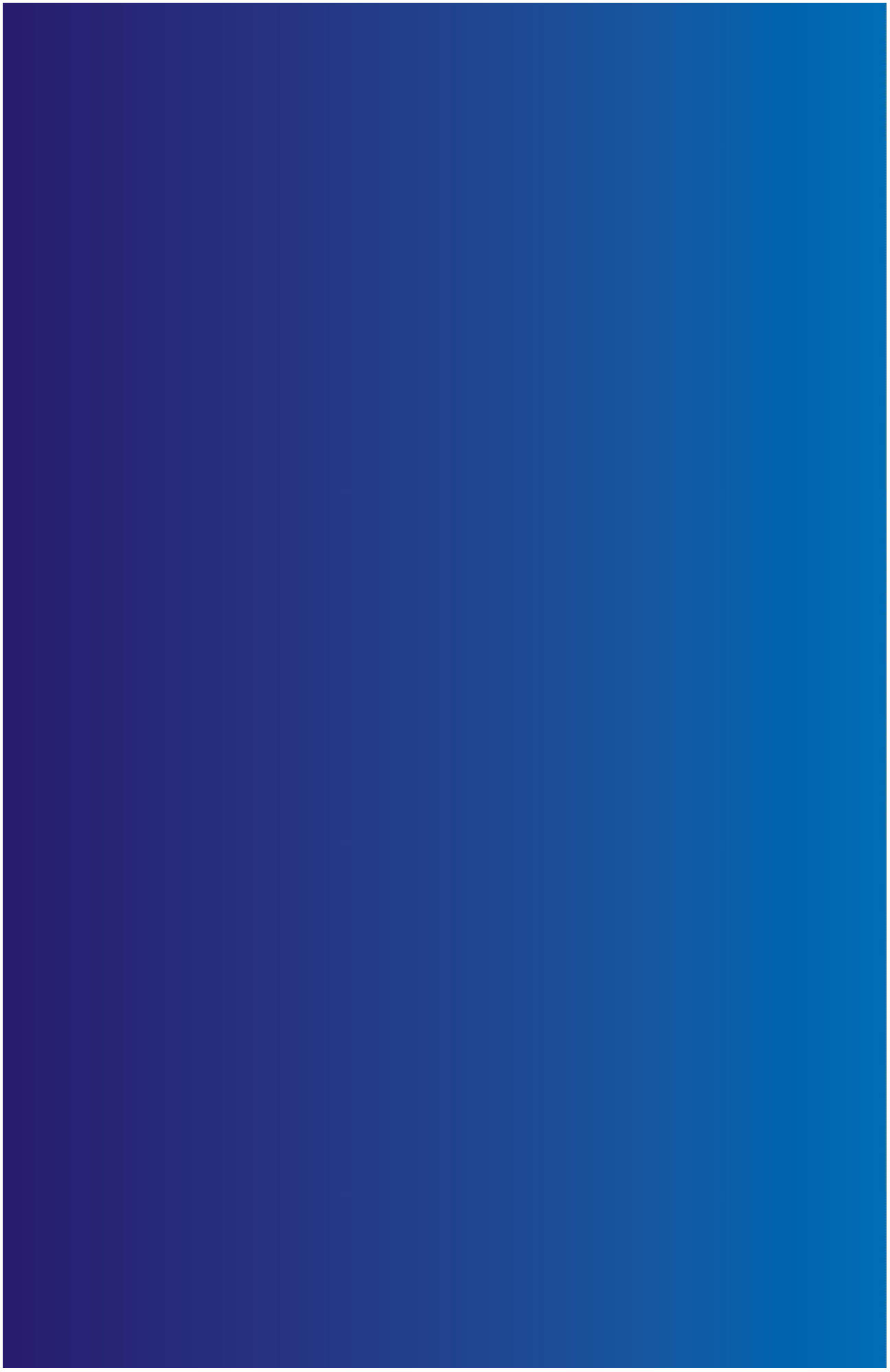
[27] Base year for ESD emissions from ESD 2018 dataset, European Environment Agency https://www.eea.europa.eu/data-and-maps/data/esd-1

[28] Base year level for UK Kyoto Protocol target for the 2nd commitment period based on 2016 inventory, as indicated in the UK's initial report.

[29] UK Annual Statement of Emissions for 2017 https://www.gov.uk/government/publications/annual-statement-of-emissions-for-2017

The UK's EU target only applies to the UK and, of its Overseas Territories, Gibraltar. As the UK's Crown Dependencies and its other Overseas Territories that have signed up to the UNFCCC and the Kyoto Protocol are not in the EU, the EU targets do not apply to these regions. Geographical coverage under the Kyoto Protocol includes all UK Overseas Territories and Crown Dependencies that have signed up to the Convention, excluding Bermuda for the Second Commitment Period (CP2).

LULUCF is excluded from the EU ESD and EU Convention targets, but included in the IPCC inventory and in accordance with Articles 3.3, 3.4 and 3.7 under the Kyoto Protocol.



4. Progress in achievement of quantified economy-wide emission reduction targets

4.1 Progress towards achieving UK targets

This section outlines the UK's progress towards achieving its quantified economy-wide emission reduction targets at the national, EU, and international level.

4.1.1 UK Government target

The UK Government has clearly defined policies to reduce emissions to meet its carbon budgets. Based on the data published in the latest Energy and Efficiencies Projections (EEP)[30], the UK met the first (2008 to 2012) carbon budget with a headroom of 36 $MtCO_2e$, representing a 25% reduction below 1990 levels; and the second (2013 to 2017) carbon budget with a headroom of 384 $MtCO_2e$, representing a 31% reduction below 1990 levels. The UK is projected to meet the third carbon budget (2018 to 2022) with headroom of 88 $MtCO_2e$, which corresponds to a 37% reduction below 1990 levels.

There are projected shortfalls against the fourth (2023 to 2027) and fifth (2028 to 2032) carbon budgets of 139 and 245 $MtCO_2e$ respectively. However, this means the UK is on track to deliver over 90% of the required performance against 1990 levels for these budgets.

The CCC will advise BEIS on setting carbon budgets in line with the UK Government's net zero emissions by 2050 target. The CCC's advice on the level of the sixth carbon budget is due in late 2020.

The UK Government's Clean Growth Strategy[31], published in October 2017, sets out possible pathways for meeting the fifth carbon budget. Key policies and proposals include:

- Accelerating clean growth;
- Improving business and industry efficiency accounting for 17% of UK emissions;
- Improving homes accounting for 15% of UK emissions;
- Accelerating the Shift to Low Carbon Transport accounting for 27% of UK Emissions;
- Delivering Clean, Smart, Flexible Power accounting for 24% of UK Emissions; and
- Enhancing the Benefits and value of Natural Resources accounting for 14% of UK Emissions[32].

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30 BEIS Energy and Emissions Projections, published May 2019 https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2018

31 BEIS Clean Growth Strategy, published October 2017 https://www.gov.uk/government/publications/clean-growth-strategy

32 Emissions statistics from BEIS 2017 UK Final GHG Statistics (2019) https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017

Information on UK Government policies and measures can be found in Annex 1, Table 3.

The UK Government carried forward a small proportion of overperformance from the second carbon budget. This carry forward is 88 $MtCO_2e$ out of a total overperformance of 384 $MtCO_2e$, or around 3% of the second carbon budget. The decision to carry forward is a technical one that does not impact the Government's commitment to taking strong domestic action to reduce GHG emissions.

The UK Government has no intention of using this overperformance to meet the third carbon budget. Instead, the carry forward will act solely as a contingency against changes in the baseline which carbon budgets are compared with. This will be released once it is clear that it will not be needed to address any technical changes in the baseline. The UK Government will decide whether to use flexibilities to help meet the fourth and fifth carbon budgets, following consultations with devolved administrations, and after obtaining and considering advice from the CCC.

4.1.2 Welsh Government target

The Environment (Wales) Act 2016[33] requires Welsh Ministers to reduce emissions in Wales by at least 80% in 2050. Regulations passed by the National Assembly for Wales in December 2018 set Wales' 2020 target at 27%, 2030 target at 45% and 2040 target at 67%. The first two carbon budgets (2016 to 2020 and 2021 to 2025) were set in legislation in December 2018.

The Welsh Government has accepted the CCC's recommendation to increase Wales's 2050 target to 95% and has requested the CCC's advice on how this affects the interim targets and carbon budgets set in 2018. The Welsh Government will ask the National Assembly to amend the existing targets and budgets in 2020.

The most recent data estimates that emissions totalled 42.2 $MtCO_2e$ in 2017, a fall of 25% compared to base year emissions.[34] This represents a 13% decrease compared to 2016, reflecting the volatile nature of Welsh emissions. The CCC believes that "if Wales can maintain this progress it will be on track to meet its first carbon budget."[35]

The plan for the first Welsh carbon budget, Prosperity for All: A Low Carbon Wales, was published in March 2019 and contains 100 policies and proposals from all emissions sectors and Ministerial portfolios.[36]

4.1.3 Scottish Government target

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 amends the Climate Change (Scotland) Act 2009, raising the ambition of Scotland's domestic targets in line with the Paris Agreement. This sets in law Scotland's target to reach net zero GHG emissions by 2045, and interim targets of 56%, 75% and 90% reductions in emissions by 2020, 2030 and 2040 respectively, relative to a 1990/1995 baseline. Scotland sets annual targets (for all other years from now to the net zero target date), in contrast to the five-yearly carbon budgets set by the UK and Welsh Governments.

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33 Environment (Wales) Act 2016 http://www.legislation.gov.uk/anaw/2016/3/part/2/enacted

34 Devolved Administrations – Greenhouse Gas Reports, National Atmospheric Emissions Inventory (2019). The baseline year for each GHG is 1990 (carbon dioxide, methane and nitrous oxide) or 1995 (HFCs, perfluorocarbons, sulphur hexafluoride, nitrogen trifluoride) http://naei.beis.gov.uk/reports/reports?section_id=4.

35 The Committee on Climate Change (2019) Reducing UK emissions – 2019 Progress report to Parliament

36 Prosperity for All: A Low Carbon Wales, Welsh Government (2019) https://gweddill.gov.wales/topics/environmentcountryside/climatechange/emissions/prosperity-for-all-a-low-carbon-wales

The most recent statistics show continued year on year progress in reducing Scotland's GHG emissions, which were down 3.3% between 2016 and 2017[37]. Scotland has reduced its emissions by 47% between 1990 and 2017. Three of the four most recently reported annual targets for emissions reduction under the Climate Change (Scotland) Act 2009 were met.

The Scottish Government's Climate Change Plan[38] was published in February 2018, setting out proposals and policies, across all sectors of the economy, for reducing GHG emissions to 2032. The Scottish Government is updating the Plan to reflect the increased target ambition of the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

4.1.4 EU 2020 targets

4.1.4.1 EU ESD

In November 2018 the European Commission confirmed each Member State's performance against ESD for 2016[39]. UK GHG emissions for 2016 under the ESD were confirmed to be 333.9 $MtCO_2e$, 11.3 $MtCO_2e$ below the UK's annual limit for 2016 of 345.2 $MtCO_2e$, meaning that the UK met its fourth annual target in the period. Provisional estimates indicate that GHG emissions for 2017 under the ESD will also be below the annual emissions limit, by around 29 $MtCO_2e$.

Table 9: Progress towards the EU ESD

UK and Gibraltar, 2013-2017 $MtCO_2e$

	2013	2014	2015	2016	2017
Total GHG emissions excl. LULUCF and NF_3 (A)	566.5	524.0	503.5	482.8	470.5
Total verified emissions from stationary installations under the EU ETS (B)	225.3	197.9	175.9	147.4	137.0
CO_2 emissions from civil aviation (C)	1.7	1.6	1.6	1.5	1.6
Total ESD emissions (D = A – B – C)	339.5	324.4	326.0	333.9	331.9
Annual emissions allocation (E)	358.7	354.2	349.7	345.2	360.4
Difference (E – D)	19.3	29.8	23.7	11.3	28.5

Source: Final UK GHG emissions national statistics 1990-2017 Excel data tables (table 9)[40]

4.1.4.2 EU ETS

Phase II of the EU ETS coincided with the first Kyoto Commitment Period (2008-12). During this period each Member State held a specific quantity of allowances based on their EU-approved National Allocation Plan (NAP). This resulted in net "sales" or "purchases" of emissions allowances reported from UK installations depending on whether total emissions were below or above the UK's Phase II allocation[41].

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37 Scottish greenhouse gas emissions 2017 https://www.gov.scot/publications/scottish-greenhouse-gas-emissions-2017/

38 Climate Change Plan: third report on proposals and policies 2018-2032 https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

39 GHG Emissions under the ESD 2018 dataset, European Environment Agency https://www.eea.europa.eu/data-and-maps/data/esd-1

40 https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics- 1990-2017

41 Note that a negative net value indicates that the reported emissions from UK installations in the EU ETS were below the cap, i.e. there was a net selling or withholding of units by UK installations. This means that emissions are either emitted elsewhere or emitted at a later stage, so they may not be used to offset UK emissions. The opposite occurs when reported emissions from EU ETS installations exceed the cap.

The third phase of the EU ETS (2013-20) builds upon the previous two phases and has been significantly revised to make a greater contribution to tackling climate change. Amongst other changes to the operating rules, the system shifted away from NAPs in favour of an EU-wide cap on the number of available allowances across Member States. In the absence of a UK-specific allocation plan, a notional cap has been estimated for the purpose of calculating carbon budget performance. Further details of this methodology are laid out in the Annual Statement of Emissions[42].

Table 10: EU ETS net trading position as reported for carbon budgets performance

UK, 2008-2017 $MtCO_2e$

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Net purchases/(sales) by UK installations	19.3	(13.5)	(7.6)	(24.9)	(14.5)	44.2	59.1	29.1	1.3	(27.6)
Net cancelled unallocated allowances/(sales) by UK Government[1]	0.9	0.9	0.9	0.9	0.9	–	–	–	–	–
Net UK domestic aviation emissions against aviation cap	–	–	–	–	–	(0.1)	(0.3)	(0.2)	(0.3)	(0.3)
Net UK purchases/ (sales)	20.2	(12.6)	(6.7)	(24.0)	(13.6)	44.1	58.8	28.9	1.0	(27.9)

Source: Final UK GHG emissions national statistics 1990-2017 Excel data tables (table 9)

Note: At the end of Phase II of the EU ETS, the UK was required to cancel all allowances which have not been either issued or auctioned by that point. As a consequence, allowances totalling 4.5 $MtCO_2e$ were cancelled in 2012. These cancelled allowances have the effect of reducing the overall cap for the whole of Phase II. For presentational purposes, this amount has been distributed evenly over the 5 years 2008-2012, effectively reducing the cap by 0.9 $MtCO_2e$ each year.

Domestic aviation emissions are included in carbon budgets accounting from 2013.

From 2013, the EU ETS entered its third phase, which will end in 2020. Changes to the operating rules in this period mean that Member States no longer receive a national cap as the ETS operates at installation level. Therefore a 'notional' cap is estimated for the purpose of carbon budgets accounting.

Values in brackets indicate negative numbers or sales.

4.1.5 UK progress towards Kyoto Protocol Targets

4.1.5.1 First Commitment Period (2008-2012)

The UK met its emissions reductions target for the first commitment period of the Kyoto Protocol. Under the first commitment period of the Kyoto Protocol (2008-12), the EU and its Member States, Iceland and Norway collectively made a commitment to reduce GHG emissions across the EU by 8 per cent on 1990 levels by 2012 through the EU ETS. As part of this, the UK undertook to reduce total GHG emissions by 12.5 per cent below base year levels over the five-year period 2008-12[43].

42 Emissions statistics from BEIS 2017 UK Final GHG Statistics (2019) https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017

43 European Council Decision (2002/358/EC) http://www.eea.europa.eu/policy-documents/council-decision-2002-358-ec

UK emissions of the basket of GHGs covered by the Kyoto Protocol were an average 600.6 $MtCO_2e$ per year (exclusive of emissions trading) over the first commitment period (2008-12), 23 per cent lower than base year emissions[44].

4.1.5.2 Second Commitment Period (2013-2020)

The UK has ratified the Doha Amendment, but it has not yet come into force. However, the UK is making good progress with regard to the target for the second commitment period of the Kyoto Protocol in terms of the overall budget.

4.2 Domestic institutional arrangements

4.2.1 UK Government

In accordance with the UK Climate Change Act, a carbon budget must be made by order, subject to affirmative resolution procedure[45]. Before laying a draft statutory instrument containing an order setting a carbon budget, the UK Government must take into account the advice of the CCC as well as any representations made by the devolved administrations. A carbon budget must then be set with a view to meeting the 2050 target and complying with European and international obligations of the UK.

The UK Government must lay before Parliament an Annual Statement of Emissions by 31 March in the second year following that to which it relates. It must also prepare and lay a Final Statement for each budgetary period by 31 May in the second year following the end of the period to which it relates, setting out, among other things, the final amount for the period of UK emissions, removals and net emissions of each GHG.

In June each year and in July in the second year after the end of a budgetary period, the CCC must lay before Parliament a report setting out its views on progress against the carbon budgets and 2050 target, to which the UK Government is required to respond by October. In the second year after the end of a budgetary period the report will also set out the CCC's views on how the UK performed on meeting the last carbon budget.

The UK Government is required to publish a plan explaining the policies and proposals to meet carbon budgets after setting each one. The most recent of these plans was the Clean Growth Strategy, published in October 2017[46]. This set out ambitious policies and proposals out to 2032 to reduce emissions across the economy and promote clean growth.

BEIS holds responsibility for strategic oversight of climate and energy policy across the UK Government, promoting and protecting the UK Government's policy interests. Climate change policy is devolved to Wales, Scotland and Northern Ireland, although the UK Government retains control over other policy areas that deliver emissions reductions. The approach taken by each government will differ, drawing on the range of policies at their disposal. Information specific to each devolved administration are included throughout this chapter. NI contributes towards the UK targets as set under the UK Climate Change Act and there is no Northern Ireland statutory target legislated for.

Tackling climate change and demonstrating leadership through action is the responsibility of every part of government: central, devolved, and local, as well as the wider public sector. Some policies are the responsibility of BEIS directly, while others are the responsibility of

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44 Record of UK base year emissions https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345163/base_year_tables.xlsx

45 More information on the affirmative resolution procedure can be found at: https://www.parliament.uk/site-information/glossary/affirmative-procedure/

46 BEIS Clean Growth Strategy (2017) https://www.gov.uk/government/publications/clean-growth-strategy

the Treasury (HMT), Department for Transport (DfT), Department for Environment, Food and Rural Affairs (Defra), Ministry of Housing, Communities and Local Government, Foreign and Commonwealth Office (FCO) and the Department for International Development (DFID).

In October 2019, it was announced that a new UK Cabinet Committee on Climate Change would be established, chaired by the UK Prime Minister. This will drive further action across government to protect the environment, reduce emissions and improve air quality, and hold departments to account for actions to combat climate change. It will bring together ministers responsible for domestic and international climate change policy across government.

At official level, BEIS coordinates UK Government policy on climate change through inter-departmental committees chaired by BEIS.

As described above, the UK Government has a rigorous monitoring and reporting framework to track progress against its domestic and international targets. The most recent reports are:

- An annual statement of emissions which shows what emissions were in the past year and where they came from – most recently the 'Annual statement of emissions for 2017'[47];
- An annual report from the independent CCC on progress against carbon budgets – most recently 'Reducing UK emissions – 2019 Progress Report to Parliament'[48];
- The UK Government response to the CCC's annual progress report, which also brings together reporting against the Clean Growth Strategy on the Emissions Intensity Ratio, metrics and actions – most recently 'Leading on clean growth: government response to the CCC 2019 progress report to Parliament – Reducing UK emissions'[49]; and
- Updated EEP, which assess the expected impact of policies on future emissions trends – most recently 'Updated EEP: 2018'[50].

The UK Climate Change Act also requires the UK to produce a UK Climate Change Risk Assessment every five years. The assesses current and future risks to and opportunities for the UK from climate change. In addition, the UK Climate Change Act requires the UK Government to produce a National Adaptation Programme for England to respond to the risk assessment. Finally, the UK Climate Change Act gives powers to the UK Government to require certain organisations to report on how they are adapting to climate change through the Adaptation Reporting Power.

4.2.2 Welsh Government

The Environment (Wales) Act 2016[51] requires Welsh Ministers to reduce emissions in Wales by at least 80% in 2050. The Act also requires Welsh Ministers to set interim emissions reduction targets for the years 2020, 2030 and 2040 and establish a system of carbon budgeting that together create an emissions reduction pathway to the 2050 target. The Act requires Welsh Ministers to publish a plan for meeting each carbon budget.

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47 BEIS Annual statement of emissions for 2017 (2019) https://www.gov.uk/government/publications/annual-statement-of-emissions-for-2017

48 CCC Reducing UK emissions – 2019 Progress Report to Parliament (2019) https://www.theccc.org.uk/publication/reducing-uk-emissions-2019-progress-report-to-parliament/

49 Defra and BEIS Committee on Climate Change's 2019 progress reports: government responses (2019) https://www.gov.uk/government/publications/committee-on-climate-changes-2019-progress-reports-government-responses

50 BEIS Updated energy and emissions projections: 2018 https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2018

51 Environment (Wales) Act 2016 http://www.legislation.gov.uk/anaw/2016/3/part/2/enacted

Welsh Ministers must lay interim targets and carbon budgets in the National Assembly for Wales. Before doing so, they must obtain, and have regard to, advice from the CCC. Welsh Ministers must lay a statement in the National Assembly no later than two years after the end of each budget, outlining the final amount of net Welsh emissions and the number of offsets used. If the carbon budget has not been met, Welsh Ministers must within three months lay before the National Assembly a report setting out proposals and policies to compensate for the excess emissions in later budgetary periods. Welsh Ministers must also lay a statement in the Assembly within two years of each interim target year, outlining the final amount of net Welsh emissions for the target year, the number of offsets used for the year and why the target has been met or missed.

Within six months of a statement from the Welsh Ministers, the CCC is required to publish a progress report on the budget or target in question. Additionally, each summer the CCC publishes a progress report on the performance of the UK as a whole against the UK carbon budgets, which may include specific recommendations for Wales. Where appropriate, the Welsh Government contributes to the wider UK Government response each autumn.

Since publishing Prosperity for All: A Low Carbon Wales and declaring a climate emergency the Welsh Government has established a permanent Cabinet Sub-Committee to provide impetus on decarbonisation from the ministerial level. The Sub-Committee's role is to coordinate action, raise ambition and make key decisions from a cross-Government perspective on the actions needed to meet the statutory decarbonisation obligations.

Its membership includes seven ministers and four deputy ministers, reflecting the shared responsibility of meeting the climate challenge. At official level, the Decarbonisation and Energy Division, which is part of the Economy, Skills and Natural Resources Group, manage the emissions reduction framework and production of the statutory plans. They also provide the secretariat to the Cabinet Sub-Committee and maintain a Portfolio Board of Directors from all departments to support Ministers.

4.2.3 Scottish Government

In April 2019, Scotland's First Minister declared a global climate emergency, and the Scottish Government is responding urgently to this challenge.

Strategic delivery plans for meeting the Scottish government targets are required by law at least every five years. The Scottish Government's Climate Change Plan[52] was published in February 2018, setting out proposals and policies, across all sectors of the economy, for reducing GHG emissions in every year to 2032. The current Plan will be updated in 2020 to reflect the increased ambition of the new targets set through the 2019 Act. Just Transition principles are embedded in the legislation, which must be considered when setting out plans to reduce emissions.

Annual reports are required to be laid in the Scottish Parliament stating whether annual emission reduction targets have been met. In addition, progress against the policies in the Climate Change Plan, including the status of their implementation, is assessed through annual monitoring reports. The first set – a baseline – of such monitoring reports was published in October 2018[53]. Future monitoring reports will then be produced under the terms of the 2019 Act, with annual sets of sector by sector reports from May 2021 onwards. The UK CCC is also tasked with producing an annual Scottish report, providing an independent perspective on progress towards targets, to which the Scottish Government must respond.

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52 Climate Change Plan: third report on proposals and policies 2018-2032 https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

53 Climate Change Plan: monitoring report 2018 https://www.gov.scot/publications/climate-change-plan-monitoring-report-2018/

A Cabinet Sub-Committee on Climate Change, chaired by the Cabinet Secretary for the Environment, Climate Change and Land Reform, oversaw the development of the current Climate Change Plan, ensuring a cross-government approach. Scottish Ministers worked collaboratively to develop proposals and policies for emissions reductions across sectors in ways that maximise opportunities and minimise costs. Alongside the Scottish Government, local government, other public bodies, the private sector, the third sector, communities, households and individuals all have important roles to play in delivering the Climate Change Plan.

A Big Climate Conversation was held over summer 2019, engaging with individuals, the private and public sectors about the roles that everyone needs to play in ending Scotland's contribution to climate change. A new Climate Change Citizens' Assembly will make recommendations to Ministers on how Scotland's net zero transition should be achieved. A National Forum on Climate Change will be established in 2020, after the update to the Climate Change Plan is published, to bring together Scotland's businesses, public sector, communities and individuals so that everyone can be involved in the continued conversation on climate change.

Action on the global climate emergency and a Green New Deal are central to the First Minister's Programme for Government[54]. This sets out new measures across all parts of the Scottish economy, with a few examples being:

- Investing over £500 million in improved bus infrastructure;
- Making the transition to net zero the primary mission of the Scottish National Investment Bank;
- Aiming to decarbonise scheduled flights within Scotland by 2040; and
- A National Planning Framework and future public infrastructure programme to lay the foundations on which we will build low and zero carbon homes, communities and industries.

The Scottish National Investment Bank and Scotland's Infrastructure Commission will also support the transition to net zero.

Scotland is committed to delivering net zero by 2045, both through devolved policy and by working with other administrations in the UK. Net zero advice from the UK CCC, provided jointly to the Scottish, Welsh and UK governments in May 2019, said that "Scotland cannot deliver net-zero emissions by 2045 through devolved policy alone."[55]

4.2.4 Northern Ireland Executive

Northern Ireland is contributing to the achievement of the UK net zero target of a 100% reduction in GHG emissions by 2050 and the UK carbon budgets. From 1990 to 2017 there has been a reduction in Northern Ireland emissions of 17.9%[56].

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54 Protecting Scotland's Future: the Government's Programme for Scotland 2019-2020 https://www.gov.scot/publications/protecting-scotlands-future-governments-programme-scotland-2019-20/

55 UK Committee on Climate Change, Net Zero – The UK's contribution to stopping global warming (2019) https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

56 Northern Ireland GHG emissions 2017 https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf

In the absence of a functioning Executive and with no strategic-level Programme for Government in place, the Northern Ireland Civil Service (NICS) has been working to a cross-departmental Outcomes Delivery Plan[57] (ODP) as a basis for delivering public services. Based on the framework of outcomes developed by the Executive formed after the election in May 2016, the ODP sets out the headline actions that departments have put in place to progress towards the former ministers' agreed objective of "Improving wellbeing for all – by tackling disadvantage and driving economic growth".

The focus on Outcomes and measures of performance based on wellbeing and improvements to people's lives is helping identify new ways of working which are forward-looking and cross-cutting. In support of the new approach, new monitoring and reporting webpages are being introduced on the Northern Ireland Executive website to assess progress and to provide dynamic messaging to highlight unique challenges and to encourage greater stakeholder engagement and more collaborative working in pursuit of each Outcome.

One of the 12 Outcomes contained in the Plan is to make Northern Ireland a place where "We live and work sustainably – protecting the environment". Six indicators are used to measure progress towards this Outcome, including one for GHG emissions as reported on in the Northern Ireland GHG Inventory statistical bulletin.

The Department for the Economy (DfE) is the lead department responsible for providing the strategic vision for the future of energy in NI. The 2010 Strategic Energy Framework[58] set the direction to 2020 and DfE is currently progressing the development of a new longer-term energy strategy to cover the period 2020 to 2050, subject to ministerial approval. The future directions for renewable energy and energy efficiency policy are expected to form integral parts of the overall strategy. The Northern Ireland Executive's target of 40% of electricity consumption coming from renewable sources by 2020 remains in place, with the figure as of 30 June 2019 standing at 44%.[59]

To increase recycling and reduce waste to landfill, a number of initiatives have been taken forward. A Northern Ireland Communications Advisory Panel has been set-up with central government, local government and Waste and Resources Action Programme to deliver timely and focused communications campaigns to build public awareness, understanding and confidence in council led recycling.

Communications has been particularly effective in supporting the implementation of the Food Waste Regulations (Northern Ireland) 2015[60] and increasing kerbside food waste recycling. During 2018/19 £3 million of capital financial assistance was provided to local councils to improve recycling.

This has been followed up by the launch of the three-year Household Waste Recycling Collaborative Change Programme in June 2019, providing local councils with £23 million of capital financial assistance to improve recycling services and infrastructure. This funding focuses on improving quality of recyclates, as well as quantity, to realise their value for the economy and environment, and support a circular economy. The initiatives delivered in the last three years have seen the Northern Ireland household waste recycling rate increase by

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57 Northern Ireland Executive Office, Outcomes Delivery Plan 2018/19 https://www.executiveoffice-ni.gov.uk/publications/outcomes-delivery-plan-201819

58 2010 Strategic Energy Framework https://www.economy-ni.gov.uk/sites/default/files/publications/deti/sef%202010.pdf

59 Northern Ireland Statistics and Research Energy, Electricity consumption and renewable generation in Northern Ireland: year ending June 2019 https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Issue-12-Electricity-Consumption-and-Renewable-Generation-in-Northern%20Ireland-July-2018- to-June-2019.pdf

60 Food Waste Regulations (Northern Ireland) 2015 http://www.legislation.gov.uk/nisr/2015/14/regulation/1/made

nearly 8 percentage points to a provisional estimate of 50.6% for the 12 month period ending 30 June 2019[61], with landfilling of household waste reducing by over 12 percentage points to 27.6% for the same period.[62]

The NICS Energy Management Strategy and Action Plan to 2030[63] focusses on reducing energy consumption by 30% by 2030 from a 2016/17 baseline. In addition, its sets a strategic context for the NI Government estate to improve energy efficiency, implement better energy procurement and aims to ensure that NI Central Government spends no more on energy in 2030 than it does today. This includes, where possible, development of plans to accommodate windfarm projects on the public forest estate, the potential for energy storage across the estate and energy efficient measures that reduce energy consumption and benefit emissions reduction. The Energy Management Strategy also encompasses work by Northern Ireland Water to reduce the production of greenhouse gases from its operations through investment of at least £6 million on a programme for energy efficiency and renewable energy generation.

The Northern Ireland Department of Education (DE) is undertaking a pilot project to install automated meter reading systems in a number of the most inefficient school buildings. It also aims to investigate and share best practice from those schools which are found to be the most efficient in terms of energy consumption, and work continues across the health estate to identify energy efficiency projects for investment.

Meeting the long-term aims of the Forestry Service Strategy to increase the level of afforestation is challenging and work is underway to gather opinions and perspectives on how to increase tree planting. In transport, the Department of Infrastructure (DfI) is progressing work to encourage a shift to cycling, increase use of public transport and support the introduction of Ultra Low Emission Vehicles to the Northern Ireland market.

Through the Northern Ireland Sustainable Energy Programme[64] energy companies provide energy saving measures to low income households. This programme has been extended to March 2022 while options for future energy efficiency provision are considered. Work is also being progressed on the introduction of new building regulations that will further improve the energy efficiency of new buildings.

4.3 Response measures

This section outlines the social and economic impacts of some of the UK's policies and measures.

4.3.1 Powering Past Coal Alliance: Just Transition Taskforce

The Powering Past Coal Alliance (PPCA) is a flagship UK and Canadian initiative focused on accelerating the pace of the transition from coal fired power generation internationally. The PPCA has grown rapidly since its launch at COP23 to encompass over 91 members and received significant recognition and support.

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[61] Northern Ireland local authority collected municipal waste management statistics April to June 2019 quarterly report https://www.daera-ni.gov.uk/publications/northern-ireland-local-authority-collected-municipal-waste-management-statistics-april-june-2019

[62] Northern Ireland local authority collected municipal waste management statistics 2017/18 annual report https://www.daera-ni.gov.uk/publications/northern-ireland-local-authority-collected-municipal-waste-management-statistics-2017

[63] The Strategic Investment Board, Energy Management Strategy and Action Plan to 2030 https://sibni.org/project/energy-management-strategy-and-action-plan-to-2030/

[64] Northern Ireland Sustainable Energy Programme https://www.uregni.gov.uk/publications/northern-ireland-sustainable-energy-programme-nisep-list-schemes-2019-2020

The PPCA has created a Just Transition Taskforce. The Taskforce offers a useful way to engage with Alliance members and big coal users, such as South Africa, ensuring that the PPCA a source of global leadership on climate and a useful resource to access as countries embark on change.

The first meeting of the Just Transition Taskforce took place in London on 1 July 2019, which incorporated members from the worldwide trade union movement, academics and civil society experts. The purpose of the Taskforce is threefold:

- To share best practice amongst existing membership and with other partners;
- Create a wider pool of expert partners that will provide global leadership; and
- Enable the Taskforce to approach countries where transitioning workers is the main barrier to change and engage with them to offer practical solutions.

For instance, it also builds on growing international attention to the issue, as demonstrated at COP 24 Katowice where the UK and others signed the Solidarity and Just Transition Silesia Declaration, and Germany and Canada's recent experiences undertaking Coal Commissions.

4.3.2 Supporting countries to develop their 2050 pathways

To support the UK 2050 pathways analysis, the UK Government developed the 2050 Calculator energy and emissions model in 2010. The Calculator is a tool that helps strengthen the level of debate on energy issues in the UK. Over the last 7 years, BEIS has supported countries around the world to develop their own calculators to explore their options to reduce GHG emissions, help tackle energy challenges, and reduce negative impacts.

An International Climate Fund programme directly supported teams in India, Indonesia, Brazil, Mexico, Colombia, Nigeria, South Africa, Vietnam, Thailand and Bangladesh. Many other countries, both developed and developing, have also adopted the model, for example China, Japan and Austria. India, Colombia, Vietnam and Nigeria have used the calculator to help develop Nationally Determined Contributions for the Paris Agreement. Some countries also use the calculator to communicate with stakeholders and the general public. For example, the South African Government has developed a simplified version for use in schools and is providing training to teachers on how to use it.

This programme has now been extended, with an extra £3.5 million to support 5 new countries to develop Calculators and to further support existing 2050 Calculator teams

4.3.3 Transition to a net zero economy

The transition to a net zero economy presents a major opportunity for the UK to be a world-leading hub for jobs, businesses and exports in low carbon sectors. There are nearly 400,000 jobs in low carbon businesses and their supply chains across the UK, with low carbon exports worth billions of pounds a year[65]. The UK low carbon economy could grow over four times faster than the rest of the economy between 2015 and 2030, which would deliver up to £170 billion of exports and supporting up to 2 million jobs[66].

To realise these opportunities, the UK is focusing on technologies and approaches central to the shift to a net zero economy, such as electric vehicles, smart systems, green finance and offshore wind. For example, the UK is a global leader in offshore wind, with the largest

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65 ONS Low Carbon and Renewable Energy Survey: 2017, (2019) https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2017

66 Ricardo-AEA for the CCC, UK business opportunities of moving to a low-carbon economy (2017) https://www.theccc.org.uk/publication/uk-energy-prices-and-bills-2017-report-supporting-research/

installed capacity in the world. The Offshore Wind Sector Deal sets out how government and industry will work together to deliver increased capacity while boosting the economy, creating new export opportunities and jobs.

As the economy evolves, the transition must be managed in a way that is fair and just. The UK is committed to supporting workers and communities who may face disruption as the economy moves away from high carbon industries, by providing opportunities to retrain and re-skill so that the benefits of clean growth are experienced by people across the UK. This was underlined when the UK signed up to the Silesia Declaration in December 2018[67], promoting efforts to ensure that no workers or communities are left behind in this transition, and the Just Transition Initiative at the UN Climate Action Summit in September 2019.

The UK is investing in the workforce to ensure that people have the right skills to deliver the low carbon transition and in high value jobs. For instance, two-year courses called 'T Levels' have been developed in collaboration with employers and businesses so that the content meets the needs of industry and prepares students for work. This includes T Levels for construction, which will help to develop the skills needed for sustainable construction to make sure buildings are energy efficient and fit for the future.

Industry has pledged to provide 1,000 work placements for T Level students through the Construction Sector Deal[68]. In addition, the Offshore Wind Sector Deal commits to supporting the development of a sector-wide curriculum to deliver a skilled and diverse workforce, whilst challenging the sector to more than double the proportion of women working in the industry to at least 33% by 2030[69].

4.3.4 Scotland's Just Transition Commission

A central pillar of the Scottish Government's approach to climate change policy is constructive dialogue, and a Just Transition Commission has been established to provide Scottish Ministers with practical advice on how to maximise the economic and social benefits of decarbonising Scotland, and manage the risks and challenges. The Commission started work in January 2019 and will provide independent advice on the opportunities and challenges of moving to a net zero economy. Membership includes representation from business, industry, trade unions, third sector and environmental groups.

The Commission's remit emphasises the need to:

- Plan, invest and implement a transition to environmentally and socially sustainable jobs, sectors and economies;
- Create opportunities to develop resource efficient and sustainable economic approaches, which help address inequality and poverty; and
- Design and deliver low carbon investment and infrastructure, and make all possible efforts to create decent, fair and high value work, in a way which does not negatively affect the current workforce and overall economy.

The Commission is engaging with businesses, workers and communities across Scotland and has been asked to report to Scottish Ministers with practical advice by early 2021. They will also provide an interim report in early 2020.

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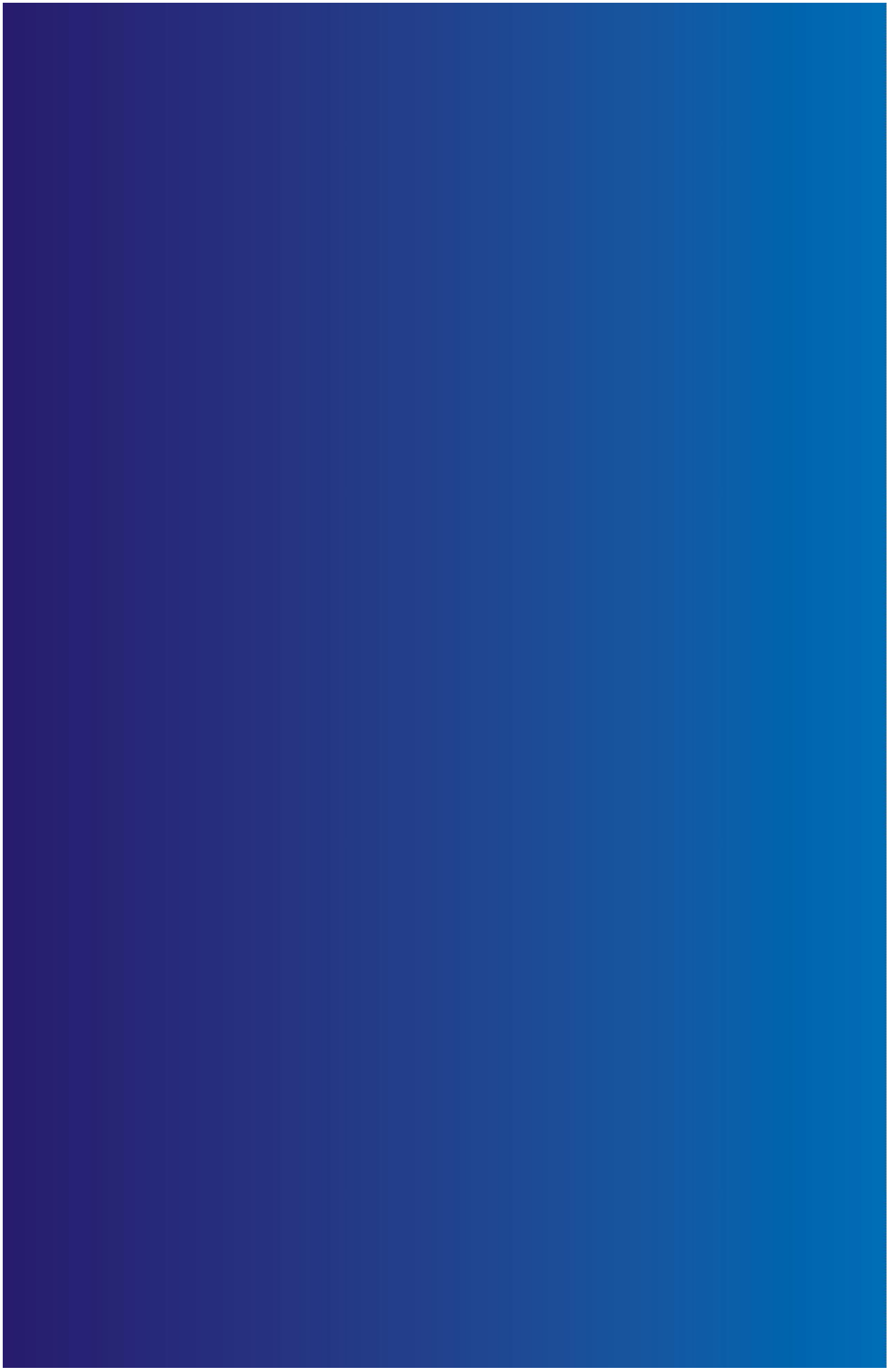
67 Just Transition Declaration – COP 24 Katowice 2018 https://cop24.gov.pl/presidency/initiatives/just-transition-declaration/

68 BEIS, Construction Sector Deal (2019) https://www.gov.uk/government/publications/construction-sector-deal/construction-sector-deal

69 BEIS, Offshore Wind Sector Deal (2019) https://www.gov.uk/government/publications/offshore-wind-sector-deal

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 has also placed just transition at the heart of Scotland's legislative framework on tackling climate change, ensuring that Ministers must take account of the principles of just transition when preparing Climate Change Plans.



5. Projections

5.1 Key developments

This section reports on updated emission projections for 2020 and 2030. The key points are:

- By 2020, the UK estimates that the emissions of the basket of 7 GHGs covered by the Kyoto Protocol[70] will be around 402 $MtCO_2e$, or 50% lower than the 1990 level; and by 2030, the UK projects that equivalent figures will be 368 $MtCO_2e$ and 54% below;
- The UK projects that emissions of CO_2, CH_4 and N_2O will be around 46%, 64% and 57% respectively below 1990 levels by 2020;
- The UK estimates (joint) emissions of the fluorinated GHGs: HFCs, PFCs and SF_6 will be 31% below their 1990 level by 2020; and
- Since the Third Biennial Report, the UK has implemented further policies to help meet both its EU effort sharing targets and the carbon budgets[71] set under the 2008 UK Climate Change Act[72].

5.2 Overall projections of GHG emissions

This chapter presents information from the UK's GHG EEP modelling. The UK published the most recent comprehensive report of this, EEP 2018, in April 2019[73]. It includes estimates of future energy demand and GHG emissions in the UK to 2035. Unlike the National Communication report, which only includes "existing" policies (referred to as "With Existing Measures", WEM), the EEP also includes planned policies, a scenario known as "With Additional Measures" (WAM).

The projection models incorporate information from the 2018 GHG Inventory. This means that the data underpinning the discussion of future trends below are slightly different to those in the sections on historic developments. For example, Chapter 2 uses figures from the 2019 Inventory. However, the broad patterns are unlikely to change much when the new information is incorporated in the next edition of the EEP.

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[70] The UK reports LULUCF emissions in full to be consistent with Inventory Convention reporting. This scope is wider than that under Articles 3.3 and 3.4 of the Kyoto Protocol and includes estimates for all anthropogenic sources minus sinks

[71] This statistical release explains how the Inventory has changed https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776085/2017_Final_emissions_statistics_-_report.pdf

[72] UK Climate Change Act (2008) http://www.legislation.gov.uk/ukpga/2008/27/contents

[73] Updated energy and emissions projections: 2018 https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2018

The UK updates its emission models of CO_2 and other GHGs annually with new data. These include revisions to policy savings estimates, fossil fuel prices, carbon price projections, growth projections, and cost estimates for the power sector. The models are also regularly reviewed and improved.

The UK focuses on values from the WEM scenario here. This includes policies that have been implemented or adopted but excludes planned measures. The scenario also excludes any use of flexible mechanisms such as EU ETS emissions trading or Joint Implementation and CDM credits. In addition, the UK provides selected data from the WAM scenario, which includes planned measures.

The figures within this Biennial Report include British Crown Dependencies and Overseas Territories. These territories are excluded from UK carbon budgets legislation and do not appear in the EEP report as one of its primary aims is monitoring progress against the carbon budgets. According to the GHG Inventory, these regions were responsible for around 0.7% of total emissions on average between 2013 and 2016 (inclusive). The UK adjusts its figures to allow for this in the Biennial Report projections.

Overall, the UK projects that GHG emissions including LULUCF will be 402 $MtCO_2e$, about 50% below the 1990 level, by 2020 and roughly 368 $MtCO_2e$ by 2030, or 54% below the 1990 level. The percentages are very similar if LULUCF is excluded.

Table 11a and 11b shows overall projections for each gas under WEM and WAM scenarios respectively. This shows that additional, planned policies mainly affect CO_2 emissions, reducing them by 6 Mt more in the year 2035 than in the WEM scenario.

Table 11a: GHG emissions by gas for WEM scenario, $MtCO_2e$ (UNFCCC coverage)

						Actuals				Projections	
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	599	563	562	562	502	412	377	322	301	300	294
Methane	133	126	109	87	64	53	52	47	44	42	41
Nitrous oxide	48	39	29	25	21	20	21	21	21	20	20
Hydrofluorocarbons	14	19	10	13	16	16	14	11	7	4	3
Perfluorocarbons	2	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphur Hexafluoride	1	1	2	1	1	<0.5	1	<0.5	<0.5	1	1
Total	798	750	712	688	605	502	464	402	374	368	359
Change from 1990 (%)		-6	-11	-14	-24	-37	-42	-50	-53	-54	-55
Memo Items											
Aviation bunkers	16	20	30	35	32	33	35	34	34	34	34
Marine bunkers	9	9	8	9	12	11	11	12	12	12	12

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

Table 11b: GHG emissions by gas for WAM scenario, $MtCO_2e$ (UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	599	563	562	562	502	412	377	321	301	296	288
Methane	133	126	109	87	64	53	52	47	44	42	41
Nitrous oxide	48	39	29	25	21	20	21	21	21	20	20
Hydrofluorocarbons	14	19	10	13	16	16	14	11	7	4	3
Perfluorocarbons	2	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphur Hexafluoride	1	1	2	1	1	<0.5	1	<0.5	<0.5	1	1
Total	798	750	712	688	605	502	464	401	374	364	353
Change from 1990 (%)		-6	-11	-14	-24	-37	-42	-50	-53	-54	-56
Memo Items											
Aviation bunkers	16	20	30	35	32	33	35	34	34	34	34
Marine bunkers	9	9	8	9	12	11	11	12	12	12	12

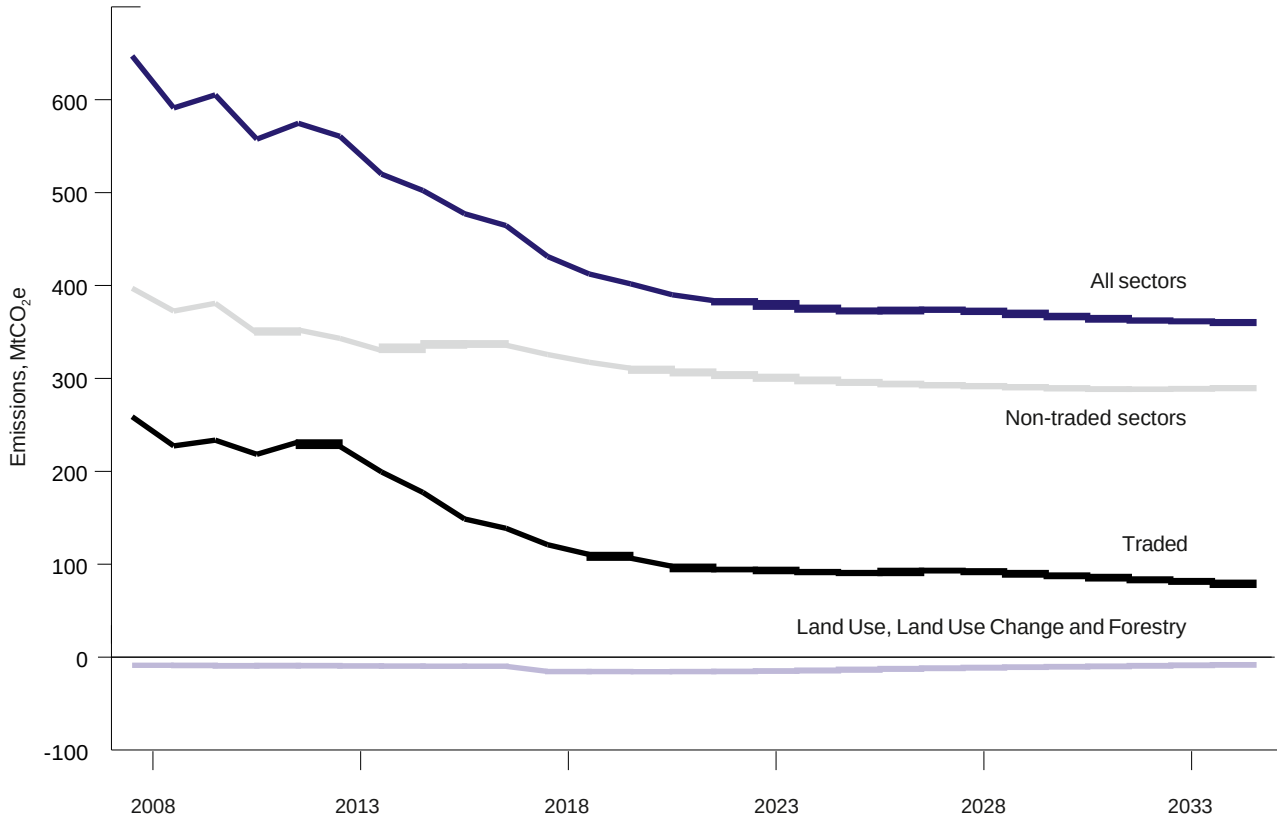
Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.2.1 Projected progress across the traded and non-traded sectors

The traded sector largely consists of emissions from power generation and heavy industry, which are discussed in the energy supply and business sectors in section 5.3.2. EEP 2018 projects that these sectors will make up around 27% of UK emissions in 2020. With existing measures, traded emissions will decrease by around 17% between 2020 and 2030 and emissions from the remaining sectors covered by the effort sharing regulation (excluding LULUCF) will fall by around 7% between 2020 and 2030 (Figure 4). In a WAM scenario, projected traded emissions decrease by around 20% over the same period. This is before taking planned and Clean Growth Strategy policies into account.

Table 12 shows that the main impact of additional planned policies is on the traded sector. By 2035, the UK projects that the additional impact of these measures could leave emissions around 6 $MtCO_2e$ (9%) lower.

Figure 4: Projected UK emissions in $MtCO_2e$ (WEM scenario, UNFCCC coverage)



Note: The historic data in this chart are from the 2019 Inventory; the projections are based on the 2018 Inventory.

Table 12: Projected progress across the Emissions Trading (EU ETS) and non-traded (effort sharing regulation) sectors (UNFCCC coverage)

WEM scenario

	Actuals			Projections			
Sector	2010	2015	2017	2020	2025	2030	2035
LULUCF	-9	-10	-10	-16	-14	-11	-8
Non-traded excluding LULUCF	381	335	336	311	297	290	290
Traded	234	177	139	107	91	88	77
Total	605	502	464	402	374	368	359

WAM scenario

	Actuals			Projections			
Sector	2010	2015	2017	2020	2025	2030	2035
LULUCF	-9	-10	-10	-16	-14	-11	-8
Non-traded excluding LULUCF	381	335	336	311	296	290	290
Traded	234	177	139	106	92	85	71
Total	605	502	464	401	374	364	353

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3 Projections by sector

Table 13 shows how the UK projects GHG emissions will be distributed across sectors of the UK economy.

Table 13: GHG emissions by sector in $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Transport	130	131	135	138	126	125	127	117	110	105	103
Energy supply	279	239	223	233	209	147	114	71	60	58	46
Business	114	112	116	109	94	85	80	83	73	69	69
Residential	80	82	89	86	88	68	67	68	71	74	78
Agriculture	54	53	51	48	45	45	46	45	42	42	41
Waste management	67	69	63	49	30	21	21	17	15	14	13
Industrial processes	60	51	27	21	13	13	11	11	10	9	9
Public	13	13	12	11	9	8	8	7	7	7	8
LULUCF	<0.5	-2	-4	-7	-9	-10	-10	-16	-14	-11	-8
Total	798	750	712	688	605	502	464	402	374	368	359
Change from 1990 (%)		-6	-11	-14	-24	-37	-42	-50	-53	-54	-55

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.1 Transport

Table 14 gives projections for transport emissions. The UK projects that they will be around 10% lower than 1990 levels by 2020 and 19% lower by 2030. The UK expects that measures will improve vehicle efficiency, such as the EU tailpipe emissions targets for new cars and vans; or will directly reduce emissions, such as mandating greater use of biofuels and providing incentives to encourage the adoption of electric vehicles.

Table 14: Transport emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	127	128	133	136	125	124	126	115	108	104	101
Methane	1	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrous oxide	2	2	2	1	1	1	1	1	1	1	1
Total	130	131	135	138	126	125	127	117	110	105	103
Change from 1990 (%)		1	4	6	-3	-3	-2	-10	-15	-19	-21

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.2 Energy supply

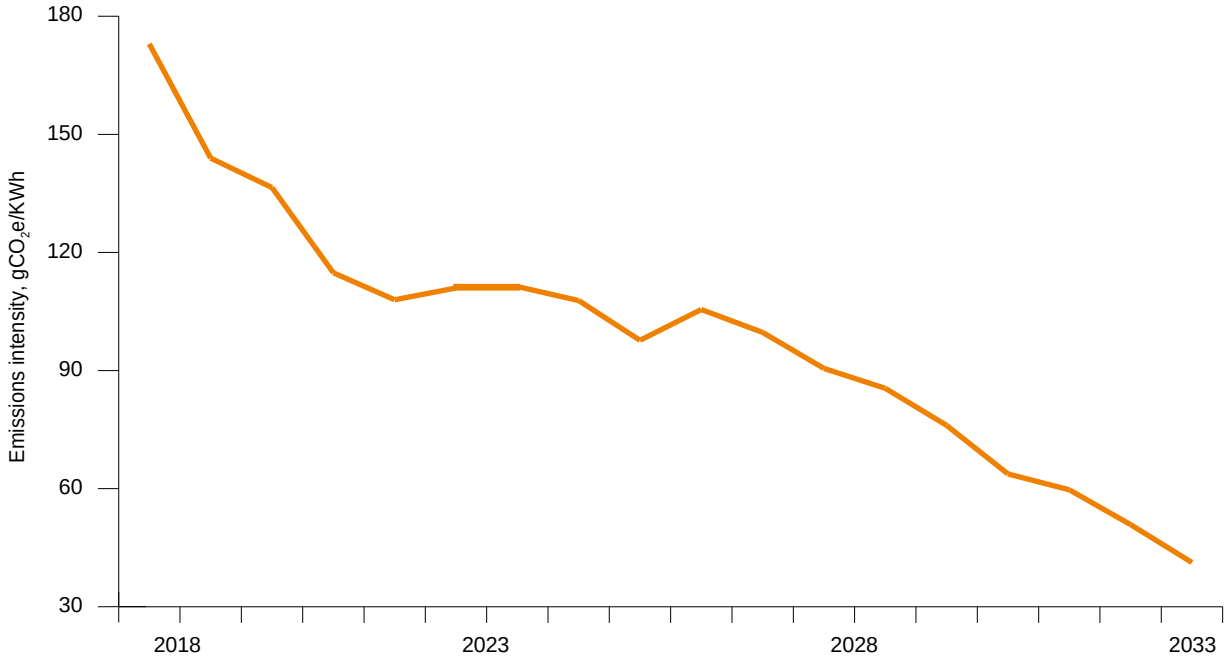
The UK projects that energy supply emissions will be 75% lower than 1990 levels by 2020 and 79% lower by 2030 (see Table 15). Following recent sharp falls in coal-fired generation, the UK projects a further gradual decline in fossil fuel-based generation out to 2035: it is displaced by more renewables and eventually nuclear generation in the 2030s. Projections show that emissions from electricity production will fall steadily over the full period to 2035. Figure 5 shows this.

Table 15: Energy Supply emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

					Actuals			Projections			
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	243	212	205	220	199	139	107	64	54	52	41
Methane	34	26	16	11	9	7	6	6	6	5	4
Nitrous oxide	1	1	1	1	1	1	1	1	1	1	1
Total	279	239	223	233	209	147	114	71	60	58	46
Change from 1990 (%)		-14	-20	-17	-25	-47	-59	-75	-78	-79	-83

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

Figure 5: Projected emission intensity of electricity supply (WAM scenario, Great Britain coverage, gCO_2e/KWh)



Primary source: EEP, 2018

5.3.3 Business

Table 16 shows business emissions may be 27% lower than 1990 levels by 2020, and 39% lower by 2030. The UK attributes improvements over time to the impact of policies that encourage energy efficiency, such as building regulations and minimum energy efficiency standards for new products, together with economic measures such as the Carbon Reduction Commitment and the Renewable Heat Incentive.

Table 16: Business emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	112	109	109	97	78	70	66	71	65	64	65
Methane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrous oxide	1	1	1	1	1	1	1	1	1	1	1
Hydrofluorocarbons	<0.5	1	5	10	14	14	13	10	6	3	2
Perfluorocarbons	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphur Hexafluoride	1	1	1	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	1
Total	114	112	116	109	94	85	80	83	73	69	69
Change from 1990 (%)		-2	1	-4	-17	-25	-30	-27	-36	-39	-40

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.4 Residential

The long-term driver of emissions from UK households is household numbers themselves. The UK projects that these will increase over the whole period due to population growth in the UK and a continuing trend for households to be smaller (Table 17). Up to 2020, the impact of increases in population and housing are offset by the impact of existing energy and emission reduction policies through, for example, improved insulation of homes. The overall impact of these factors will lead to a projected rise in domestic emissions of 9 $MtCO_2e$ (14%) between 2020 and 2035.

Table 17: Residential emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	79	80	86	83	85	65	65	66	68	71	75
Methane	2	1	1	1	1	1	1	1	1	1	1
Nitrous oxide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	80	82	89	86	88	68	67	68	71	74	78
Change from 1990 (%)		2	11	7	9	-16	-16	-15	-12	-8	-3

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.5 Agriculture

The UK projects emissions from the agriculture sector will decline by around 7% between 2020 and 2030. Table 18 shows this.

Table 18: Agriculture emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	6	6	5	6	5	5	6	6	5	5	5
Methane	31	30	29	27	25	26	26	25	24	24	24
Nitrous oxide	17	17	16	15	14	14	14	13	13	13	13
Total	54	53	51	48	45	45	46	45	42	42	41
Change from 1990 (%)		-2	-7	-11	-17	-16	-16	-18	-22	-24	-24

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.6 Waste management

The UK projects that annual GHG emissions from waste management will fall to 75% below 1990 levels by 2020 and to 79% below by 2030 (table 19 19). Waste emissions from landfill will continue to fall because more waste is being preferentially disposed of in alternative ways, such as through incineration, biological waste treatment (BWT) and recycling; and because small improvements in landfill efficiency continue to be made.

The Landfill Directive helps to drive forward waste policy. It expires in 2020. Therefore, the projection is that the proportion of waste going to landfill will stop decreasing from 2020, although emissions reductions should continue for a time as emissions lag behind disposal. The UK projects increases in BWT emissions and domestic wastewater emissions will partially counteract the decrease in landfill emissions.

Table 19: Waste Management emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	1	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methane	65	68	62	48	28	19	19	15	13	12	12
Nitrous oxide	1	1	1	1	1	1	1	1	1	2	1
Total	67	69	63	49	30	21	21	17	15	14	13
Change from 1990 (%)		4	-6	-26	-55	-69	-69	-75	-78	-79	-80

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.7 Industrial processes

Table 20 indicates that emissions from industrial processes will fall 82% below 1990 levels by 2020 and 84% below by 2030.

Table 20: Industrial Processes emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	19	18	17	16	11	12	10	10	9	9	9
Methane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrous oxide	24	14	5	3	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hydrofluorocarbons	14	18	3	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorocarbons	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphur Hexafluoride	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	60	51	27	21	13	13	11	11	10	9	9
Change from 1990 (%)		-15	-55	-66	-79	-79	-82	-82	-84	-84	-85

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.8 Public

The UK projects emissions from public services will remain broadly constant until the mid-2020s before rising slightly in the late 2020s and 2030s (Table 21).

Table 21: Public emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	13	13	12	11	9	8	8	7	7	7	8
Methane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrous oxide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	13	13	12	11	9	8	8	7	7	7	8
Change from 1990 (%)		-2	-10	-17	-30	-41	-42	-48	-48	-44	-42

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.3.9 Land Use, Land Use Change and Forestry

The amount of carbon stored in UK trees has increased since 1990. However, UK experts expect this balance will change in the future as forests mature (carbon uptake reduces) and as more are felled and replanted over the sustainable forest management cycle. They suggest the accumulation rate will fall substantially by 2030. Table 22 reflects this.

Table 22: LULUCF emissions by GHG, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

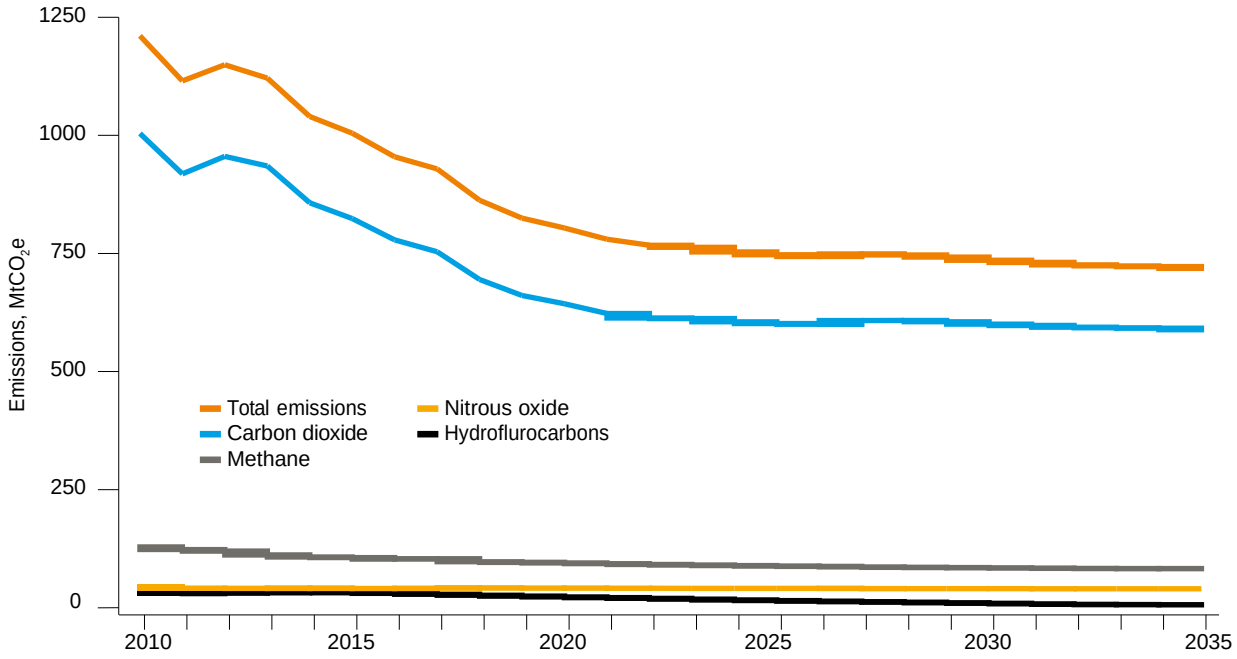
							Actuals				Projections
Gas	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Carbon dioxide	-2	-4	-6	-9	-11	-11	-11	-17	-16	-12	-10
Methane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrous oxide	2	2	2	2	2	1	1	2	2	2	2
Total	<0.5	-2	-4	-7	-9	-10	-10	-16	-14	-11	-8
Change from 1990 (%)		-770	-1,617	-2,885	-3,666	-3,902	-3,973	-6,220	-5,586	-4,240	-3,286

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.4 Projections by gas

This section focuses on overall trends in the emissions of each GHG. Figure 6 shows projections for overall emissions of GHG gases to 2035.

Figure 6: Overall emissions of GHGs by gas, $MtCO_2e$.



Note: The historic data in this chart are from the 2019 Inventory; the projections are based on the 2018 Inventory.

5.4.1 Carbon dioxide

Table 23 shows that the largest sectoral emitters of CO_2 in 2020 are, in decreasing order, transport, business, residential and energy supply. By 2030, a decrease in CO_2 emissions from energy supply of around 18% and increases in residential emissions mean that the order of the last 3 becomes residential, business and energy supply. By 2030 the UK expects CO_2 emissions will be around 50% lower than 1990 values.

Table 23: CO_2 emissions by sector, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

					Actuals				Projections		
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Transport	127	128	133	136	125	124	126	115	108	104	101
Energy supply	243	212	205	220	199	139	107	64	54	52	41
Business	112	109	109	97	78	70	66	71	65	64	65
Residential	79	80	86	83	85	65	65	66	68	71	75
Agriculture	6	6	5	6	5	5	6	6	5	5	5
Waste management	1	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Industrial processes	19	18	17	16	11	12	10	10	9	9	9
Public	13	13	12	11	9	8	8	7	7	7	8
LULUCF	-2	-4	-6	-9	-11	-11	-11	-17	-16	-12	-10
Total	599	563	562	562	502	412	377	322	301	300	294
Change from 1990 (%)		-6	-6	-6	-16	-31	-37	-46	-50	-50	-51

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.4.2 Methane

The two biggest emitters of CH_4 are agriculture and waste management. The UK projects a modest decline in CH_4 emissions between 2020 and 2030 of around 5 $MtCO_2e$. This means that by 2030, emissions of CH_4 will be around 68% lower than 1990 (Table 24).

Table 24: CH_4 emissions by sector, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Transport	1	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Energy supply	34	26	16	11	9	7	6	6	6	5	4
Business	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Residential	2	1	1	1	1	1	1	1	1	1	1
Agriculture	31	30	29	27	25	26	26	25	24	24	24
Waste management	65	68	62	48	28	19	19	15	13	12	12
Industrial processes	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Public	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
LULUCF	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	133	126	109	87	64	53	52	47	44	42	41
Change from 1990 (%)		-5	-18	-34	-52	-60	-61	-64	-67	-68	-69

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.4.3 Nitrous oxide

The majority of N_2O emissions come from agriculture. The UK expects little change in these over the projected period, expecting that they will be around 58% lower in 2030 than in 1990.

Table 25: N_2O emissions by sector, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

							Actuals				Projections
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Transport	2	2	2	1	1	1	1	1	1	1	1
Energy supply	1	1	1	1	1	1	1	1	1	1	1
Business	1	1	1	1	1	1	1	1	1	1	1
Residential	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Agriculture	17	17	16	15	14	14	14	13	13	13	13
Waste management	1	1	1	1	1	1	1	1	1	2	1
Industrial processes	24	14	5	3	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Public	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
LULUCF	2	2	2	2	2	1	1	2	2	2	2
Total	48	39	29	25	21	20	21	21	21	20	20
Change from 1990 (%)		-20	-41	-49	-56	-58	-57	-57	-58	-58	-58

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.4.4 Hydrofluorocarbons

Almost all HFCs are emitted by the business sector. The UK projects steady reductions so that emissions in 2030 may be 7 $MtCO_2e$ less than in 2020, equivalent to a 70% decline since 1990.

Table 26: HFC emissions by sector, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

					Actuals			Projections			
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Business	<0.5	1	5	10	14	14	13	10	6	3	2
Industrial processes	14	18	3	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	14	19	10	13	16	16	14	11	7	4	3
Change from 1990 (%)		33	-31	-9	15	11	-1	-22	-49	-70	-81

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.4.5 Polyfluorocarbons

PFCs remain at low levels over the projection period.

Table 27: PFC emissions by sector, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

					Actuals			Projections			
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Business	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Industrial processes	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	2	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Change from 1990 (%)		-64	-64	-77	-83	-80	-78	-79	-79	-79	-79

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

5.4.6 Sulphur hexafluoride

SF_6 emissions remain at low levels over the projection period.

Table 28: SF_6 emissions by sector, $MtCO_2e$ (WEM scenario, UNFCCC coverage)

					Actuals			Projections			
Sector	1990	1995	2000	2005	2010	2015	2017	2020	2025	2030	2035
Business	1	1	1	1	1	<0.5	<0.5	<0.5	<0.5	<0.5	1
Industrial processes	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total	1	1	2	1	1	<0.5	1	<0.5	<0.5	1	1
Change from 1990 (%)		<0.5	42	-18	-46	-64	-60	-65	-64	-61	-58

Primary source: Inventory 2019. EEP, 2018, uplifted to UNFCCC coverage

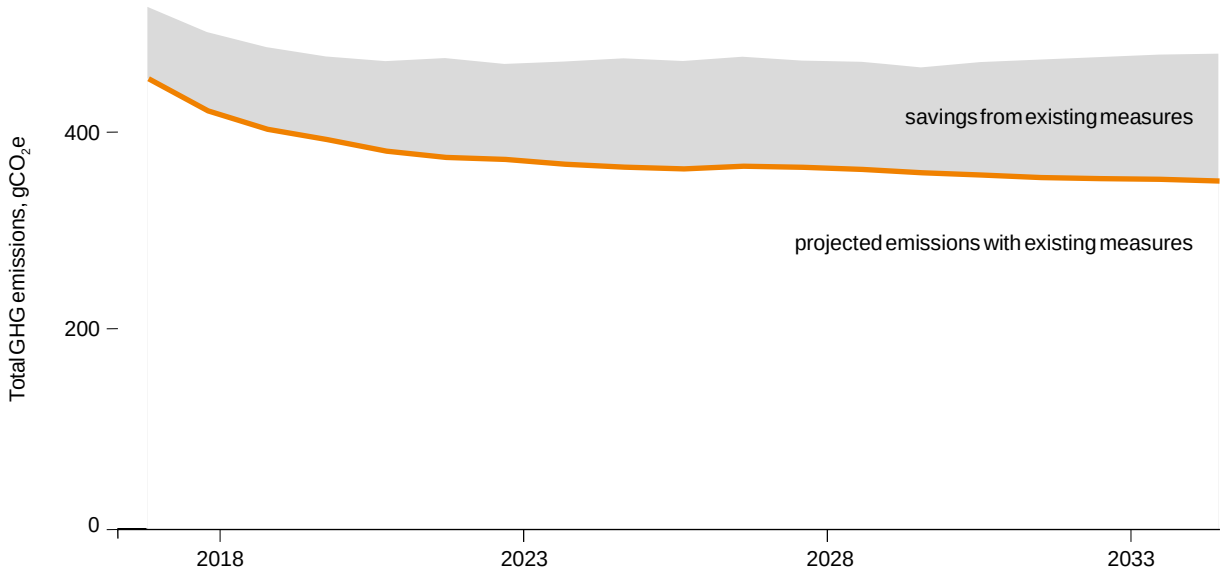
5.5 Total effect of policies and measures

The majority of projections presented are from a WEM scenario. They include the impact of all the UK's implemented and adopted policies and measures. Both these and emissions savings are in the policies and savings table in Annex 1, Table 3. The WEM scenario does not include planned policies, so the figures there differ from those in the EEP report.

Since the last Biennial Report[74], the UK has continued to update its analysis of policies and measures expected to help meet both the EU effort sharing targets and the targets for the carbon budgets set under the UK Climate Change Act.

[74] The UK's Third Biennial Report was published in Annex 1 of the UK's Seventh National Communication https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i

Figure 7: Projected impact of policies (WEM scenario, UK coverage)



Source: EEP, 2018

The UK treats the policies adopted before 2009 as part of the baseline because carbon budgets were set for the first time in 2009. Figure 77 and Table 29 show the estimated emissions savings attributable to policies adopted between April 2009 and April 2019, as published in the 2018 UK EEP. For example, in 2020 the UK projects that policies (excluding planned) will deliver emissions reductions of around 84 $MtCO_2e$.

To avoid double-counting savings, the UK estimates the impacts of each policy according to a hierarchy. The UK reports the emission reduction residual due to each once the savings from measures further up the hierarchy have been accounted for. The latter considers the level of imperative imposed by a policy—whether there is regulation, an incentive or advice—and the date of its implementation.

The values of differences in projected emissions between scenarios do not exactly match the sum of emissions reductions provided by individual policies. This is due to price interactions and to adjustments to policy impacts to improve accuracy.

The Clean Growth Strategy set out over 50 additional policies and proposals that will drive emissions down throughout the next decade and beyond. Through preparing this Strategy, the UK Government identified areas where it will need to see the greatest progress, both through technological breakthroughs and large-scale deployment, in order to meet its national emissions reduction targets.

Table 29: Projections of total net GHG emissions, $MtCO_2e$ (WEM scenario, UK coverage)

			Projections		
Scenario	2017	2020	2025	2030	2035
Emissions excluding the impact of measures adopted between 2009-17 (baseline)	511	490	488	475	486
Emissions including all implemented or adopted measures (excluding planned policies)	460	398	370	364	356
Savings from measures adopted 2009-17 (excluding planned policies)	73	84	110	107	129

Source: EEP, 2018

5.6 Projection methods by sector

The UK has largely derived the projections of the UK's emissions of CO_2 and combustion-related emissions of other GHG (CH_4 and N_2O) from the BEIS EEP modelling. This models the UK energy market including final sector energy use and the electricity supply sector. It includes a top down and bottom up econometric model of energy demand and combustion-related GHG emissions for the UK economy with a bottom-up supply side model. The sector classification and the principal source of energy statistics is the Digest of UK Energy Statistics (DUKES)[75].

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

The EEP model suite projects emissions using projections for fossil fuel prices, carbon prices, economic growth and demographics. The key assumptions section (5.7.4) includes sources for these assumptions.

The UK's published projections include scenarios for high and low fossil fuel price assumptions, high and low GDP growth rates and a baseline that excludes post-2009 climate change policies and measures. The projections published in the UK are typically presented in WEM and WAM scenarios, 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 from the UK WEM scenario and are scaled up to include Crown Dependencies and Overseas Territories emissions.

Projections of energy demand by fuel and sector start from a baseline econometric business as usual projection, from which savings due to policies and measures are subtracted. The projections include all firm and funded government environmental policy measures as most recently evaluated. In the WEM scenario all these are adopted policies: this Biennial Report does not include policies which only have planned status.

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

5.6.1 Transport

The CO_2 road transport model is an econometric response surface model integrated into the economy-wide Energy Demand Model (EDM) and calibrated against the Department for Transport's (DfT) National Transport Model. The econometric model is multi-modal as it includes cars, light good vehicles, heavy goods vehicles and public service vehicles. It includes a population driver for cars and a manufacturing Gross Value Added (GVA) driver for heavy goods vehicles as well as price, motor spirit/diesel engine share and fuel efficiency and biofuel substitution effects.

Most energy efficiency improvements are policy driven, such as by EU new car emissions intensity targets and complementary measures such as lower rolling resistance tyres for heavy goods vehicles. Unlike for other demand sectors, impacts of policies and measures on road transport fuel demand are modelled within the economy-wide EDM. Road vehicle efficiencies, motor spirit/diesel engine shares and biofuel use under different policy scenarios are used to calculate mitigation impacts from differences in demand between scenarios.

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[75] Digest of UK Energy Statistics, UK Government https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

Electricity demand from electric cars and light good vehicles passes to the Dynamic Dispatch Model (DDM), which models a demand-side response.

Non-CO_2 road transport emissions projections follow a bottom up calculation methodology in line with that for the historical time-series of emissions. The activity data (vehicle distances travelled) is projected using 2018 DfT traffic forecasts[76].

DfT's projected traffic growth, the planned electrification of existing track and the construction of new lines such as Crossrail and High Speed 2 underpin the rail transport model.

Projections for UK commercial aviation involve estimates of future UK GDP, consumer expenditure, population and oil prices. The Fleet Mix Model captures efficiency improvements, for example the modelling assumes increasing use of biofuels. DfT provides more detailed information about methodology and assumptions with its aviation forecast[77]. The modelling has extrapolated historical trends in the GHG Inventory to extend the aviation emissions projections to UNFCCC coverage.

The UK projects national navigation will remain largely static.

5.6.2 Energy supply

BEIS uses the Dynamic Dispatch Model (DDM) to project investment and generation in the electricity supply sector. The DDM is a market-based model that simulates the operation of the electricity market and the investment decisions of the market participants in detail. It is a profit-maximisation model incorporating the effect of government policies such as Contracts for Difference, which incentivise low-carbon generation through market mechanisms.

The DDM also models investment in the supply of heat and electricity from Combined Heat and Power plants, mostly in industry. Oil refinery emissions are calculated from the latest energy consumption statistics from the DUKES.

5.6.3 Business

For emissions projections, the UK breaks manufacturing down into sectors using the Standard Industrial Classification (SIC). The manufacturing sectors in the EDM are:

- Chemicals;
- Construction;
- Engineering and vehicles;
- Food, drink and tobacco;
- Iron and steel;
- Non-ferrous metals;
- Non-metallic mineral products;
- Pulp, paper and printing;
- Textile products; and
- Manufacturing not elsewhere classified.

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76 Road traffic forecasts 2018 https://www.gov.uk/government/publications/road-traffic-forecasts-2018

77 UK aviation forecasts 2017 https://www.gov.uk/government/publications/uk-aviation-forecasts-2017

The UK projects GVA for each of these sectors using GDP, interest rates and, in some cases, terms of trade (the relative prices of imports and exports). The UK projects total energy demand for each sector from GVA and energy prices. Except for iron and steel, the modelling splits the total energy demand into different fuels using historical fuel demands and projections of relative fuel prices. In iron and steel, the UK estimates energy demand using sector GVA and the tonnages of steel produced using electricity or by the Basic Oxygen Steel process.

Energy demand is projected by commercial services from sector GVA, using the average growth rate since 1991, and temperature. The overall demand is then split into fuels.

To project business electricity demand from business, it is included in non-domestic demand and passed to the DDM. Emissions from fuels combusted on-site are included in business.

5.6.4 Residential

The UK projects the residential emissions from gas, oil and solid fuels use separately. The estimates depend on assumptions about the percentage of households using each fuel as their main heating source. The primary drivers of residential energy demand are household numbers, fuel prices, temperature and income. The same drivers predict domestic electricity demand. This is passed to the DDM.

5.6.5 Agriculture

UK agriculture uses a relatively small amount of energy. Therefore, projections of its emissions come from simple trend models.

Defra uses Food and Agricultural Policy Research Institute (FAPRI) methodology[78] to provide projections of activity, such as livestock numbers, crop production and fertiliser nitrogen use, and non-CO_2 emissions to 2030. These are flat lined for later years. The FAPRI projections come from an economic model that assumes a specific set of international prices for agricultural commodities and a path for the sterling exchange rate. Together, these factors are important determinants of the returns to farmers and hence of total agricultural production. Defra converts these FAPRI activity projections to emissions using the latest agriculture GHGI model.

5.6.6 Waste management

Projections of CH_4 from landfill depend on Defra's projections of tonnages of municipal waste going to landfill and on HMRC's figures for commercial and industrial waste. Waste composition is projected from knowledge of changes to BWT processes and from Defra's projections of waste arising.

These projections of waste going to landfill are then run through MELMod[79], the landfill emissions calculation model. The MELMod model is based on the IPCC's first-order decay methodology, which the 2014 GHG Inventory report summarises[80]. ONS population projections underpin predictions of emissions of CH_4 and N_2O from domestic wastewater and sewage/sludge decomposition. Industrial wastewater emissions are predicted to stay

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78 FAPRI-UK Greenhouse Gas Emission Modelling System for England, Wales, Scotland and Northern Ireland https://www.afbini.gov.uk/publications/fapri-uk-greenhouse-gas-emission-modelling-system-england-wales-scotland-and-northern

79 Eunomia, Inventory Improvement Project – UK Landfill Methane Emissions Model http://sciencesearch.defra.gov.uk/Document.aspx?Document=9887_WR1124Finalreportincludingappendices.pdf

80 Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2015 https://naei.beis.gov.uk/reports/reports?report_id=932

constant. BWT emissions from multiple sources are combined. Some are projected to be constant and some are extrapolated from the latest year of historical data using sector experts' estimates of future BWT capacity.

5.6.7 Industrial processes

Manufacturing sector GVAs or the energy demand used to project business emissions underpin some projections of CO_2 emissions from industrial processes. Other CO_2 emissions will stay at the Inventory value.

Many methods are used for projections of non-CO_2 emissions from industrial processes. Some sources use manufacturing sector GVAs while others use more detailed assumptions about future activity. Annex N of the EEP[81] provides more information about these approaches.

5.6.8 Public

Sector employment levels are used as the main driver in modelling non-electricity energy demand from public services. The projections assume that the historical trend of improving energy efficiency per employee will continue. Temperature also affects demand. The models break non-electricity energy demand into fuels using the same proportions as in latest historical data.

Electricity demand is trended to use only public sector employment as a driver and is included in the non-domestic demand we pass to the DDM.

The modelling of emissions from public services does not consider energy prices.

5.6.9 Land use, land use change and forestry

The Centre for Ecology & Hydrology and Forest Research model LULUCF emissions using approaches that are consistent with the current inventory methodology. They produce 4 scenarios – Baseline, Central, High and Low – for future emissions. Each makes assumptions about afforestation, wildfires, peat extraction, land use change and deforestation. They developed these scenarios with a policy maker stakeholder group and updated them in 2016 following discussions with UK devolved administrations. Broadly, their central scenario is a continuation of current policies and activity rates. This is the scenario used in generating emissions projections for this report.

5.7 Methodology

5.7.1 Estimation of emissions in Crown Dependencies and Overseas Territories

The UK's Crown Dependencies and Overseas Territories are not included in the projections that the UK produces annually to monitor progress against its own carbon budgets. The projections in this Biennial Report supplement the UK annual figures with forecasts for those areas that are consistent with the UK 1990 to 2016 GHG Inventory. The latter are simple linear trends of the emissions in each National Communication sector based on observations from the last nine years. Emissions in these territories are only a small proportion of UK emissions, making up around 0.7% of the UK's UNFCCC coverage emissions recently.

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81 Updated energy and emissions projections: 2018 https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2018

5.7.2 Strengths of the projection methodology

The UK's modelling has the following strengths:

- The initial starting points for the projections are the latest historical data from the Inventory and DUKES, which are based on the 2018 Inventory (latest actuals 2016) and 2018 energy statistics (latest actuals 2017), both published in 2018., and are well established, recent sources of information;
- The main Energy Demand Model (EDM) uses econometric methods that capture long-run relationships between economic activity, energy consumption and emissions;
- The detailed model of electricity generation captures both short-run fuel switching and long-term investment strategies;
- The UK updates its projections regularly as part of the monitoring of UK national carbon budgets;
- The models use authoritative national and international sources for socio-economic projections;
- There is a rolling programme of review and update for the projection methodologies and econometric models, and modelling performance is tested by back-casting to see how well they predict what happened in the recent past;
- The projections distinguish between business as usual emissions and the emission reductions due to mitigating policies and measures; and
- The modelling estimates the mitigation impacts of policies using a common cross-Government methodology[82].

5.7.3 Weaknesses of the projection methodology

The UK's modelling has the following weaknesses:

- the modelling generally assumes that historical relationships will continue in the future, which can fail to capture structural changes and new technologies where these fall outside the scope of included policies and measure
- there is considerable recognised uncertainty in economic and social projections from external sources
- econometric modelling is subject to estimation errors and the possibility of incorrect identification energy use drivers

5.7.4 Key assumptions

A set of key assumptions about UK economic growth, demographic changes and future fuel price trajectories underpin the EEP. The main sources of the projections are the forecasts made by the UK's Office for Budget Responsibility (OBR) and Office for National Statistics (ONS), and supplemented by International Monetary Fund projections of world growth. Fuel prices are those BEIS produces. Table 5 in Annex 1 documents key parameters and assumptions.

[82] Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

The UK released the most recent EEP in April 2019. UK GDP up to 2021 was from the March 2018 Economic and Fiscal Outlooks[83] and beyond 2021 GDP came from the January 2017 Fiscal Sustainability Report[84]. The UK's ONS produced the population projections in 2016 alongside a supporting methodology description. It produces population and household projections. The ONS released information about changes in methodology since the previous population projection alongside the 2018 population projections[85]. The household projections combine population projections with household formation propensities. Table 30 shows updated socio-economic growth assumptions.

Table 30: UK Growth Projections, percentage per annum

	Actuals				Projections
Change in:	2017	2020	2025	2030	2035
GDP	1.7	1.3	2.1	2.3	2.3
Households	1.0	0.9	0.8	0.7	0.6
Population	0.6	0.6	0.5	0.4	0.3

Source: EEP, 2018

BEIS updates the fossil fuel price and carbon prices projections annually, which are subject to peer review and are used widely across government. Table 31 shows the key fossil fuel and carbon price values for EEP modelling, and Table 32 shows the exchange rate assumptions.

Table 31: Fossil fuel and carbon price assumptions

	Actuals				Projections
Price for:	2017	2020	2025	2030	2035
Crude oil (Brent 1 month), $/bbl	56.03	71.72	77.70	84.67	84.67
Gas (NBP), p/therm	45.69	48.00	56.00	63.00	63.00
Coal (CIF ARA), $/tonne	85.58	85.67	85.67	86.67	86.67
EU ETS carbon price, £/tCO_2	5.19	13.84	17.70	42.66	42.66

Source: EEP, 2018

Table 32: Exchange rates against sterling

	Actuals				Projections
Exchange rate	2017	2020	2025	2030	2035
Euros (€ per £)	1.14	1.10	1.07	1.07	1.07
US Dollars ($ per £)	1.29	1.38	1.42	1.42	1.42

Source: EEP, 2018

5.7.5 Quality assurance and quality controls

Quality assurance of modelling is a high priority within government, and analysis for the EEP follows the BEIS quality assurance guidelines.

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83 Office for Budget Responsibility, Economic and fiscal outlook – March 2018 https://obr.uk/efo/economic-fiscal-outlook-march-2018/

84 Office for Budget Responsibility, Fiscal sustainability report – January 2017 https://obr.uk/fsr/fiscal-sustainability-report-january-2017/

85 Office for National Statistics, 2016-based household projections for England: changes to methodology https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/methodologies/2016basedhouseholdprojectionsforenglandchangestomethodology

A small group of BEIS analysts produces the energy and emission projections, and owns, maintains and updates the Energy Demand Model (EDM) which underpins these. The EEP team liaises with other modelling teams both inside and outside BEIS to quality assure and compile the data which go into the overall projections.

Figures relating to electricity come from cycling two specialised models with the EDM. These are the DDM and the Prices and Bills Model of retail electricity prices. This cycling ensures that electricity demand is in equilibrium with prices. The owners of these models help to check model results. Projections for non-energy non-CO_2 come from the BEIS Science division.

The Centre for Ecology & Hydrology produces the UK's LULUCF projections under contract; this is overseen by the BEIS Science and Innovation for Climate and Energy Directorate.

BEIS bases transport sector modelling on, and calibrates it against, the detailed models for road, rail and air used by the Department for Transport (DfT). These latter are in turn subject to DfT's quality assurance.

Analytical teams in the relevant areas prepare estimates of the emissions or energy savings due to government policies. These are normally based on the Impact Assessments for each measure. Analysts prepare the latter according to central guidance, which ensures that energy use and GHG emissions are valued consistently across government.

Analysts send the policy savings in a standard template and the EEP team checks them to look for any unaccounted overlaps and to ensure internal consistency between energy and emissions savings. The team confirms the model savings with the submitting analysts and departments. The UK updates its GHG projections annually to inform progress against national carbon budgets and publishes each set of projections. The EEP team improves and adapts the core Energy Demand Model incrementally, quality assuring each change to confirm validity and robustness. (The team responsible for the DDM quality assures any change relating to electricity generation.) The EEP team presents interim and final results to a Steering Group which oversees the process, and stakeholders review draft EEP reports before publication. The independent Committee on Climate Change (CCC) reviews the projections after their release.

5.8 Uncertainty

In April 2019 the UK published annexes of data to accompany the EEP. These included low and high fossil fuel prices and low and high UK GDP rates as variant scenarios and sensitivities.

5.8.1 Fossil fuel prices

Table 33 shows the price assumptions used when modelling the fossil fuel prices scenarios.

Table 33: Prices in fossil fuel variant scenarios (various scenarios, UK coverage)

	Actuals				Projections
	2017	2020	2025	2030	2035
Low Fossil Fuel Prices					
Crude oil (Brent 1 month), $/bbl	56.03	49.81	54.79	59.77	59.77
Gas (NBP), p/therm	45.59	35.00	36.00	36.00	36.00
Coal (CIF ARA), $/tonne	85.58	57.78	61.76	65.75	65.75
High Fossil Fuel Prices					
Crude oil (Brent 1 month), $/bbl	56.03	93.64	106.59	119.54	119.54
Gas (NBP), p/therm	45.59	72.00	75.00	78.00	78.00
Coal (CIF ARA), $/tonne	85.58	112.57	114.56	116.55	116.55

Source: EEP, 2018

The EEP team produced these scenarios following 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. They are not sensitivities to the overall level of fossil fuel prices and do not maintain fuel cross-price ratios.

5.8.2 Growth sensitivities

To investigate the impact of different economic growth rates, the EEP includes scenarios where the economy performs at 25 basis points per annum above or below the reference scenario value. Table 34 shows this.

Table 34: Variant UK GDP growth sensitivities (various scenarios, UK coverage)

	Actuals				Projections
Scenario	2017	2020	2025	2030	2035
High UK GDP Growth	1.7	1.5	2.3	2.6	2.6
Low UK GDP Growth	1.7	1.0	1.8	2.1	2.1

Source: EEP, 2018

Taking the combinations of the different fossil fuel and GDP variants gives 4 different emissions scenarios as shown in Table 35.

Table 35: Total GHG emissions according to fuel price and economic growth variant scenarios, $MtCO_2e$ (WAM policy accounting for various scenarios, UK coverage[1]).

					Projections
Scenario	2017	2020	2025	2030	2035
Reference scenario	448	398	371	361	350
Variant scenarios					
Low Fossil Fuel Prices	448	404	377	378	361
High Fossil Fuel Prices	448	398	364	349	342
Low UK GDP Growth	448	397	368	357	346
High UK GDP Growth	448	399	372	364	353

Note: includes LULUCF

Source: EEP, 2018

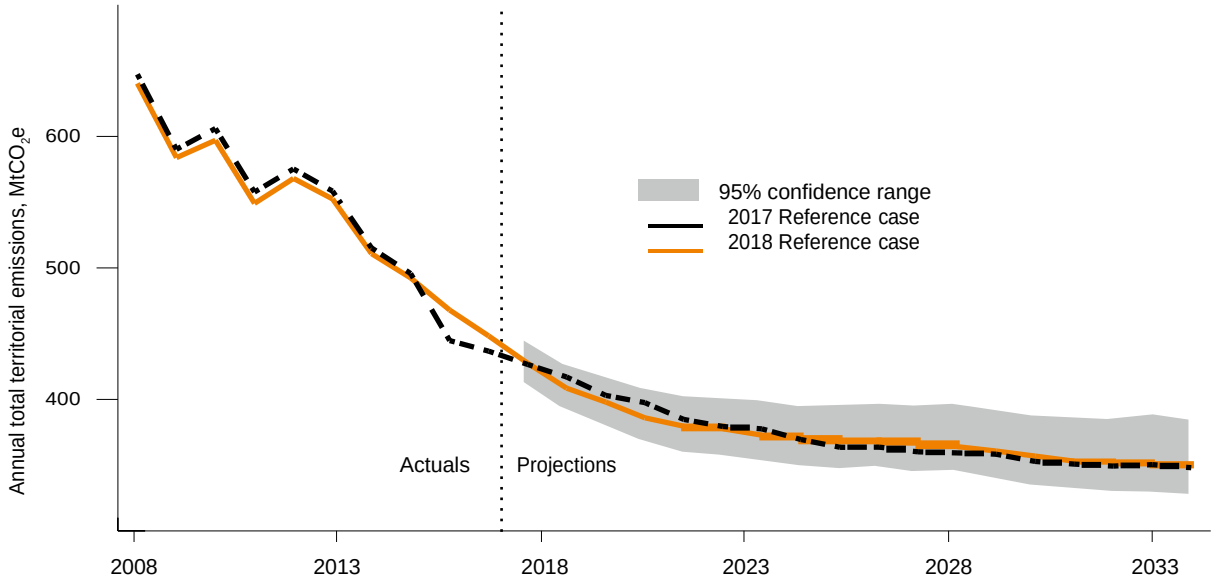
5.8.3 Overall uncertainty

The future values of key variables such as fossil fuel prices, the impacts of policy and demographic/economic growth cannot be known with certainty. However, these variables underpin EEP forecasts. Understanding the impact of this uncertainty is important in the context of the UK's aim to reduce emissions through policy intervention, and so it is regularly investigated in EEP publications. This is based on the most influential drivers of energy use and emissions, previously identified through sensitivity analysis. The EEP team carries out a Monte Carlo simulation to vary the values of these drivers, firstly obtaining historical distributions of input values then running the projections model on samples from these distributions. The approach records the outputs from 10,000 simulations.

This method underpins the 95% confidence interval estimates in Figure 8 and Table 36. The upper and lower boundaries represent the projected emissions corresponding to the lower 2.5% and upper 97.5% percentiles of the simulations respectively. The uncertainty analysis excludes the electricity supply industry and possible "structural breaks" in society or the economy which might significantly affect emissions. For example, societal and behavioural step changes or breakthrough technologies like improved storage could have profound impacts on the UK's energy mix and emissions but are hard to anticipate.

[1] The UK's Crown Dependencies and Overseas Territories are not included in this sensitivity analysis.

Figure 8: Uncertainty in UK projected emissions (WAM scenario, UK coverage)



Note: includes LULUCF

Source: 2018 EEP

Table 36: Confidence interval for total GHG emissions from Monte Carlo simulation (WAM scenario, UK coverage)

			Projections
Uncertainty, $MtCO_2e$	2020	2025	2030
Upper 95% confidence interval	418	394	392
2018 Reference case	398	371	361
Lower 95% confidence interval	380	350	341
Comparisons, %			
Upper 95% confidence interval, difference from reference	5	6	9
Lower 95% confidence interval, difference from reference	-4	-6	-6
Upper 95% confidence interval, change on 1990 values	-47	-50	-51
Reference, change on 1990 values	-50	-53	-55
Lower 95% confidence interval, change on 1990 values	-52	-56	-57

Source: EEP,2018

The methodology only looks at future uncertainty and does not examine uncertainty in historical inputs or emission estimates, such as those before 2018. Uncertainty is higher for later years, reflecting the reduced confidence in modelled projections further into the future. By 2020, the UK projects GHG emissions will be between 47% and 52% below 1990 levels, with the reference case (WAM) estimate 50% below.

5.9 Differences from the last Biennial Report

Table 37 summarises the differences between the projections compared to the last Biennial Report[86], which was based on projections produced in 2017.

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 and economic growth assumptions.

The EEP team has also updated the projections to take account of improvements to the historical inventory and other improvements to methods, emission factors and activity data.

The net effect of these changes is to reduce projected emissions in 2020 from 48% below 1990 levels in the Third Biennial Report to 50% below 1990 levels in the Fourth Biennial Report. The projected GHG reduction of 12 $MtCO_2e$ between the two projections is mostly because the Fourth Biennial Report projects fewer CO_2 emissions: there are minimal changes in the projections of the other gases.

Table 37: Comparison with last Biennial Report, $MtCO_2e$

	Third Biennial Report			Fourth Biennial Report		
GHG including LULUCF	1990	2020	Projected change (%)	1990	2020	Projected change (%)
Carbon dioxide	599	334	-44	599	322	-46
Methane	135	47	-65	133	47	-64
Nitrous oxide	51	22	-57	48	21	-57
Hydrofluorocarbons	14	11	-23	14	11	-22
Perfluorocarbons	2	<0.5	-84	2	<0.5	-79
Sulphur Hexafluoride	1	<0.5	-70	1	<0.5	-65
Total GHG	803	414	-48	798	402	-50

Primary source: EEP, uplifted to UNFCCC coverage

[86] The UK's Third Biennial Report was published in Annex 1 of the UK's Seventh National Communication https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i

6. Provision of financial, technological and capacity-building support to developing country Parties

6.1 Key developments

The UK remains committed to the collective goal to mobilise $100 billion per year in climate finance from a range of sources by 2020. The UK continues to work towards its 2015 pledge to provide £5.8 billion in international climate finance (ICF) between 2016/17 and 2020/21. At the 2019 UN Climate Action Summit, the UK committed to doubling provision of UK climate finance to £11.6 billion for the period between 2021/22 and 2025/26.

The UK's ICF helps developing countries mitigate and adapt to the impacts of climate change, promote jobs and livelihoods, reduce poverty and support cleaner economic growth. UK ICF focuses on achieving transformational change, recognising the need to align all finance flows with a pathway towards climate resilient, low-emission development. The UK is one of the largest contributors to major multilateral climate funds including the Green Climate Fund (GCF), with a £720 million commitment to the Initial Resource Mobilisation and a £1.44 billion pledge to the first replenishment and the Climate Investment Funds (CIF).

In 2017 and 2018, the UK announced several new bilateral programmes to support developing countries. These include the £177.5 million Sustainable Infrastructure Programme in Latin America; the £106 million Market Accelerator for Green Construction; and the £60 million UK Partnerships for Accelerating Climate Transitions (UK PACT), a dedicated technical assistance programme, which aims to build lasting capacity to tackle climate change in accordance with the needs and priorities of developing countries.

Recognising that adaptation is a priority for many developing countries, in our £5.8 billion commitment the UK aims for a balance between adaptation and mitigation.

Between 2011/12 and 2018/19, it is estimated that ICF programmes have supported 57 million people to cope with the effects of climate change; reduced or avoided 16 $MtCO_2e$ and mobilised £3.8 billion public and £1.4 billion private finance for climate change purposes in developing countries. Due to the nature of the UK's long-term transformative programming, these impacts will continue to increase throughout the lifetime of our portfolio.

The UK has also committed to aligning all Official Development Assistance (ODA) – which the UK has a legal commitment to provide at a level equivalent to 0.7% Gross National Income – with the Paris Agreement, given the importance of all finance being aligned with a pathway to low emission, climate resilient development. The UK strategy for aligning all finance flows with clean, resilient growth was set out in the 2019 Green Finance Strategy[87], which included this ODA commitment.

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87 HMT and BEIS, Green finance strategy (2019) https://www.gov.uk/government/publications/green-finance-strategy

UK climate finance is reported according to a leading, in-house accounting framework which enhances accuracy in reporting. The majority of UK climate finance is grant-based, with 91% of support provided over the reporting period done through grants.

62 Overview of UK support, approach and channels

Domestically and internationally the UK plays a leading role combating climate change. Ahead of COP 21, the UK pledged to provide at least £5.8 billion in ICF between 2016/17 and 2020/21. This positions the UK Government as amongst the largest contributors of public climate finance. The UK is committed to providing support that is transparent, transformative and in line with the needs and priorities of developing countries. The UK also remains firmly committed, alongside other developed countries, to jointly mobilising $100 billion of public and private finance a year by 2020, in the context of meaningful mitigation and transparency of action.

Our approach to climate finance recognises that support will play an important but partial role in the collective challenge of driving the shift in finance needed to meet the Paris Agreement. Through ICF, the UK aims to:

- Build resilience of the poorest people and communities, supporting developing countries to prepare for and adapt to climate change, improve disaster management and reduce both the harm caused by climate impacts and the costs of responding.;
- Work to ensure that the vast expansion in infrastructure in developing countries is low carbon and climate resilient, building capacity and unlocking greater flows of private finance towards clean growth, to bring down the costs of a global low carbon transition and help align all finance flows with a pathway to low emission, resilient development; and
- Support work to halt deforestation and create new supply chains that are both profitable and sustainable: the UK helps communities to use land in ways that reduce emissions and improve productivity whilst protecting and restoring forests that support important biodiversity and fragile ecosystems.

In 2019, the UK set out a wider role for the financial sector in delivering global and domestic climate and environmental objectives through our Green Finance Strategy, including setting out where ICF programmes were helping to build green finance capability and capacity in developing countries.

This chapter sets out an overview of the support that the UK provides to developing countries. Where possible with multi-year programmes, the specific amount of finance provided in the reporting period has been stated. The UK's full portfolio of climate finance programming over the reporting period can be found in Annex 1, Table 7.

63 Overview of UK commitments

The UK is continuing to scale up support towards the shared $100 billion goal and continues to work towards fulfilling our pledge to provide £5.8 billion in ICF over a five-year period, enabling a doubling of 2014 levels to at least £1.76 billion in 2020. In 2017 and 2018, the UK delivered just over £2 billion of this commitment (£902.5 million in 2017 and £1,168.5 million in 2018), equivalent to $2,720 million. This does not include climate finance and/or co-benefits delivered through UK contributions to multi-lateral development banks like the World Bank – where, for instance, the UK is the largest shareholder of the International Development Association (IDA), the world's largest provider of concessional climate finance to the poorest and most vulnerable countries.

Recognising that adaptation is a priority for many developing countries, the UK aims for a balance between our mitigation and adaptation funding. The UK provided £1,012 million in adaptation funding over the reporting period. The UK has also committed, alongside Germany and Norway, to provide $5 billion for countries, communities and companies who bring forward ambitious projects to halt and reverse deforestation in the developing world.

ICF represents a dedicated climate commitment which is new and additional to historic Official Development Assistance (ODA) levels – in 2009, when the $100 billion goal was set, total UK ODA was £7.3 billion, compared to £13.4 billion in non-climate ODA in 2018. Non-climate ODA, which is readily trackable given that there is a dedicated ring-fence on climate ODA, has therefore continued to rise alongside UK efforts to scale up climate finance.

The UK has more recently set out a series of ambitious commitments to further strengthen our future support for developing countries to take climate action:

- As part of the UK's Green Finance Strategy, the UK Government has committed to ensuring that all UK ODA is aligned with the Paris Agreement goals and is compatible with a low-carbon, climate resilient pathway;
- At the UN Climate Action Summit, the Prime Minister committed to double the UK's five-year £5.8 billion climate finance, to £11.6 billion over the period between 2021/22 and 2025/26;
- A doubling of our pledge to the GCF through its first replenishment, to £1.44 billion, making the UK the largest contributor to the fund; and
- Up to £1 billion for the Ayrton Fund, a dedicated fund working with developing countries to develop, test and catalyse a range of clean energy technologies and business models to drive sustainable and inclusive growth, and combat climate change.

6.4 Financial support through International Climate Finance

6.4.1 Institutional approach to UK support

The UK's ICF is the delivery vehicle for the UK's £5.8bn of climate finance programmes. UK ICF is part of the UK's broader Official Development Assistance work and is delivered via three government departments, DFID, BEIS and Defra.

The three departments manage a portfolio of investments collectively aiming to support developing countries to address climate change and to eradicate international poverty now and in the future by helping developing countries to manage risk and build resilience to the impacts of climate change, to take up low-carbon development at scale and to manage natural resources sustainably.

Delivery across the departments ensures the best expertise from across government is used, enabling maximum impact in developing countries.

- BEIS primary focus is on low carbon development in countries with high or growing emissions, with a focus on accelerating decarbonisation, making markets work to help finance the climate transition and halting deforestation;
- DFID focuses on helping countries anticipate and cope with climate change, as well as supporting lower carbon development choices, which includes climate resilient food and water supplies, infrastructure and delivery of essential services, as well as supporting sustainable economic growth; and

- Defra focuses on mitigation and adaptation through sustainable natural resource management, food security, and protection of biodiversity with a strong focus on forestry, including mangroves.

Cumulative data collected shows that, between 2011/12 and 2017/18, ICF programmes have:

- Supported 57 million people to cope with the effects of climate change;
- Provided 26 million people with improved access to clean energy;
- Reduced or avoided 16 million tonnes CO_2e;
- Installed 1,600 MW of clean energy capacity; and
- Mobilised £3.8 billion public and £1.4 billion private finance for climate change purposes in developing countries.

UK ICF is provided through a mixture of bilateral and multilateral channels. The following section sets out in more detail how the UK directs its climate finance, firstly by outlining the support the UK provides to the operating entities of the UNFCCC Financial Mechanism and other cross-cutting multilateral funds, and then providing an outline of UK support for mitigation, adaptation and land-use activities.

The UK considers that an integrated approach, combining elements of financial, technological and capacity building support is necessary in order to respond to the needs of developing countries, and therefore all programmes are considered under the ICF umbrella. However, the subsequent sections of this chapter outline programmes with specific technological or capacity building elements.

Alongside the ICF, which is the UK's core climate finance, several other government funds with wider remits also provide finance for climate action. The UK's Cross-Government Prosperity Fund includes a focus on promoting reforms to energy markets to accelerate the transition to low carbon growth, drawing on the UK's world-leading expertise in policy frameworks, energy system optimisation, promotion of renewable energy, roll out of smart technologies and building a green finance industry to accelerate the transition to low carbon growth.

The Global Challenge Research Fund and the Newton Fund leverage the internationally recognised strength of the UK's research base, ensuring that the UK takes a leading role in promoting research and innovation to address development challenges, including flooding and famine caused by climate change, environmental degradation and the development of low-carbon energy. The funds play a critical role in advancing development for the poorest people and countries and promoting long-term sustainable growth.

6.4.2 The UK's categorisation of support

In our reporting tables, the UK has categorised the status of 2017 and 2018 multilaterals and bilateral spend as 'committed'. The reported finance is the amount recorded as spent through promissory notes for UK Government budgetary purposes. Promissory notes represent a binding commitment for the UK to provide the note's total value to the stated recipient. The full value of the note is recorded as spent once formally laid with the Bank of England, but the actual drawdowns of cash from the note will take place over several years.

The tables do not account for spend that has been pledged or committed for future years. However, for each programme covered in the overview below, the total amount pledged for the total duration of each programme is given alongside the amount committed in the reporting period.

6.4.3 Support for multilateral climate funds

The UK has been a key contributor to the financial mechanism of the UNFCCC and continues to support the multilateral climate funds and to ensure their effectiveness in delivering climate finance within the broader financial architecture.

The UK pledged £720 million to the Initial Resource Mobilisation of the GCF mobilization, the key multilateral fund for implementing the Paris Agreement. In 2019, the UK announced a doubling of our pledge for the GCF's first replenishment of an additional £1.44 billion. The UK is committed to ensuring that the GCF delivers maximum impacts in the developing countries it supports, including through both its 50:50 split for mitigation and adaptation and a renewed focus on strategic and effective programming, building on lessons learned to date. Since 2015, the GCF has programmed around $5.2 billion across 111 projects and leveraged over $18.7 billion in co-financing.

The UK is also one of the leading contributors to the Global Environment Facility (GEF), having pledged £250 million for the 2018-2022 period. The GEF has supported over 1,000 climate mitigation projects and contributed to almost 3 billion tonnes of GHG emission reductions.

The UK remains the largest investor in the CIF, having invested over $2.5 billion since 2008 to pilot low-emission and climate resilient development through projects implemented by the multilateral development banks. The CIFs support transformations in 4 key areas of clean technology, energy access, climate resilience and sustainable forests, through a portfolio 310 projects in 72 developing and middle-income countries. These projects are delivering significant development benefits, such as increased energy security, reduced local air pollution, and job opportunities as well as mitigating CO_2 and increasing climate resilience. The CIFs are also unlocking additional private finance flows into climate investments in developing countries.

6.4.4 Mitigation

The UK is using ICF to support increased mitigation action, which is critical to achieving global climate goals. Limiting global warming to 1.5°C will require annual global emissions to fall by around 50% by 2030. Over the same time frame, the global economy is expected to double, and $90 trillion will be needed to invest in infrastructure to meet sustainable development goals. ICF aims to help shift these investment decisions towards low-carbon, climate resilient and inclusive growth, in a way that responds to the needs of developing countries, and to support countries to overcome the barriers they face in implementing their current NDCs.

To address these challenges and support a shift in investment decisions towards low-carbon, climate resilient and inclusive growth, our targeted finance aims to:

- Demonstrate and deploy technologies, policies and approaches that are critical for a 1.5°C or well below 2°C trajectory;
- Drive decarbonisation at scale through the international development system, including by supporting the development banks to scale up their climate investments;
- Build capacity and capability in countries to implement and strengthen their NDCs and raise ambition further, working to overcome regulatory and institutional barriers, including sharing UK skills and expertise where it is helpful; and
- Deliver clean energy to the millions of people currently without any access to electricity and other forms of modern energy.

The following section outlines the UK's ICF support for mitigation, including programmes focussed on investment for decarbonisation, as well as highlighting two specific focus areas for UK ICF: developing carbon markets and directly targeting private finance mobilisation.

These are in addition to our contributions to multilateral funds set out in the above section. ICF programmes that more directly target capacity building and technology transfer can be found in these respective sections.

6.4.4.1 Accelerating Decarbonisation

Over 2017/18, the UK launched several programmes to accelerate decarbonisation internationally, primarily in the areas of infrastructure and cities. The UK also supports decarbonisation in developing countries through its support for research, development and deployment of low-carbon technologies, which are detailed within the '6.5 Technology transfer and development' section of this chapter.

In October 2018, the UK announced the £106.1 million Market Accelerator for Green Construction, a new collaborative programme between the UK and the International Finance Corporation to drive the financing and construction of more energy efficient buildings in developing economies. The programme will build demonstration portfolios of green construction at scale, reducing emissions, mobilising new finance and inspiring markets to shift towards the new energy efficient buildings of the future. An initial £68 million was committed over the reporting period.

The UK pledged an additional £100 million to the Renewable Energy Performance Platform, in addition to the £48 million initially pledged for the period 2015 to 2020. The UK is the sole donor to the programme, which provides technical and financial support to private sector developers of small-scale renewable energy projects in sub-Saharan Africa. As of May 2019, the Renewable Energy Performance Platform is providing support packages to 25 renewable energy projects in 12 countries, which include solar PV, hydropower, onshore wind, and biomass, and both on- and off-grid technologies. £2.8 million was committed over the reporting period.

In 2017, the UK Government announced the £27.5 million ICF Climate Leadership in Cities programme, which supports cities in developing countries to plan for, and attract financing for, ambitious climate action. The programme provides technical assistance on climate action planning to 15 megacities across Latin America and Asia, and helps disseminate lessons learned to a wider network, as well as supporting a finance facility providing technical support to help cities secure financing. In addition, the programme supports national decision makers to shape more sustainable urban development, through a global evidence generation and national advocacy initiative. £8 million was committed over the reporting period.

The UK has contributed £185 million to the Nationally Appropriate Mitigation Action (NAMA) Facility, a multi-donor facility established by the UK and German governments in 2012, working in partnership with Denmark and the European Commission. It supports and funds NAMAs for countries that are unable to attract private sector funding, to encourage low-carbon development pathways and thus reduce GHG emissions. The NAMA Facility currently has 12 projects in implementation over a range of sectors, including renewables, transport, buildings and agriculture, across countries in Latin America, Asia and Africa. £85 million was committed to the facility over the reporting period. £85 million was committed over the reporting period.

The UK's contribution to the Energy Sector Management Assistance Programme during the reporting period supports the clean energy transition and ensures technical support is available and accessible to countries wanting to consider or increase the pace of coal phase out in the short term. £19.2 million was committed over the reporting period.

The Green Mini-Grids Africa Regional Facility aims to help transform the mini grid sector from a growing and sporadic series of pilot projects, to a thriving industry. Work includes development of small-scale electricity generation which serves a limited number of consumers

via a distribution grid that can operate in isolation from national electricity transmission network. Transformation is to be achieved through the creation of a critical mass of experience and evidence of success in Kenya and Tanzania, coupled with improved policy and market conditions for investments regionally. £8.6 million was committed to the programme over the reporting period.

6.4.4.2 Carbon Markets

In addition to programmes specifically targeting decarbonisation, the UK supports climate change mitigation through carbon markets, both nationally and internationally. Carbon pricing provides a cost effective and technology-neutral way of reducing emissions by raising the costs of high carbon activities, thereby incentivising emission reductions and increased ambition for climate change. The UK has invested over £110 million of its ICF across 3 funds that support carbon pricing and decarbonisation through market mechanisms in developing countries.

In March 2017, the Transformative Carbon Asset Facility was operationalised, with a budget of around $205 million of which the UK's share was £60 million. The programme supports emission reduction crediting approaches at the policy and sectoral level by delivering results-based payments for emissions reductions that go beyond the host-country's NDCs and informs the development of international carbon markets.

The UK also continues to support the Partnership for Market Readiness programme with a £7 million commitment (made prior to the reporting period), which provides financial and technical assistance to support the establishment of domestic carbon pricing instruments including carbon taxes, crediting and offset mechanisms, and to facilitate knowledge exchange across borders.

The UK also supports the World Bank's Carbon Initiative for Development with a £50 million commitment (made prior to the reporting period), which connects sub-Saharan homes and communities to clean energy sources, while increasing national capacity to participate in the international carbon market. The programme has helped improve access to clean energy for over 2.8 million people. £110,000 was committed over the reporting period.

6.4.4.3 Focus area: private finance

Mobilising private climate investment is crucial to meeting the long-term goals of the Paris Agreement and to shifting the trillions needed to ensure the sustainability of future global investment. However, there are a range of barriers that continue to prevent increased investment in developing countries, and targeted climate finance can help to overcome these. The UK supports several investments which specifically aim to increase private finance.

In 2017, the UK established the £177.5 million Sustainable Infrastructure Programme Latin America, a technical assistance and capital investment programme to support partner countries to accelerate the implementation of NDCs by mobilising private sector investments into sustainable infrastructure. The programme combines capital investment for demonstration projects with other technical and financial support, including technical assistance to governments to help them shape their regulatory frameworks in a way that is attractive to private investors, support the development of local capital markets. Sustainable Infrastructure Programme Latin America focusses on Brazil, Colombia, Mexico, and Peru. £102 million was committed over the reporting period and the UK is actively exploring opportunities to develop a similar programme in Asia to launch in 2020.

The UK also continues to implement its commitments outlined in the previous Biennial Report. The £200 million UK Climate Investments aims to scale-up private finance flows in Indian and sub-Saharan African markets through equity investments into renewable energy and energy

efficiency. £44 million was committed over the reporting period. £9.2 million was committed over the reporting period to the Get FiT Uganda Programme, which supports small-scale, on-grid projects in Uganda and promotes private investment. £22.5 million was committed over the reporting period to the Global Climate Partnership Fund, a public-private partnership that works with local banks in developing countries to open new markets in sustainable lending.

Support for the second phase of the Private Infrastructure Development Group, aimed at mobilising private investment in infrastructure in to increase service provision for the poor, boost economic growth and alleviate poverty in the world's poorest countries. £16.7 million was committed over the reporting period.

By deploying expertise and small amounts of capital through equity, debt, guarantees, project development funds and grants, the Private Infrastructure Development Group operates across the infrastructure project life-cycle and capital structure to address the early stage risks associated with infrastructure projects, making projects bankable and acting as a key enabler for other DFIs and private investors to co-invest. Through this Private Infrastructure Development Group delivers high development impact in low-income countries and fragile and conflict-affected states that helps economies grow and combat poverty.

The UK supported the Climate Finance Accelerator, an initiative designed to turn countries' NDCs into finance plans with pipelines of investment-grade projects. The Accelerator brings together policy makers, project developers and financial experts from selected countries, to date Colombia, Mexico, Nigeria and Vietnam, enabling the transfer of knowledge, facilitating investment and promoting useful dialogue to increase climate action. £75,000 was committed over the reporting period.

The Global Innovation Lab is a board of experts who scrutinise innovative climate finance projects and help develop them by attracting private sector investment. The project has catalysed over $1.4 billion for Lab-endorsed proposals in the past 4 years. £430,000 was committed over the reporting period.

6.4.5 Adaptation

The need to reduce emissions is widely accepted across the world. But the climate is already changing, with many millions of people facing food and water shortages and greater risks to health and life as a result. Recognising that some climate impacts are unavoidable, and that adaptation is comparatively under-funded, the UK aims for a balance between our adaptation and mitigation funding. 50% (£448 million) of the UK's climate finance was spent on adaptation in 2017, and 49% (£564 million) in 2018. In total, the UK has provided over £2.4 billion in adaptation finance since 2013.

The UK's bilateral adaptation funding is targeted at the poorest and most vulnerable people in the world. Recognising that developing countries face a number of barriers and challenges in accessing and attracting climate finance, the UK uses its influence within climate funds and multilateral banks to ensure that the needs of the poorest are prioritised and that the terms on which the finance is provided are appropriate.

The UK will continue to build on its strong track record through its leadership of the Climate Resilience theme at the UN Secretary General's 2019 Climate Summit, seeking to drive a transformation in the way climate change risk and adaptation is addressed globally.

The UK's support for adaptation concentrates on 4 areas:

- Adapt to long term changes well in advance, changing or diversifying livelihoods and ensuring infrastructure is fit for purpose;

- Anticipate and reduce the impact of climate variability and extremes through effective forecasting and preparedness measures;
- Absorb the effects of climate extremes and disasters through effective and rapid response that enables people to cope with disaster and recover quickly; and
- Respond – the UK is the world's third largest humanitarian donor, having allocated approximately £1.96 billion in funding towards humanitarian aid in 2017, which is a more than quadrupling of humanitarian assistance from 2009 levels.

The UK's adaptation programming include the Disaster Risk Insurance programme which improves the resilience of the private sector in poor countries to natural disasters. By supporting the development of a market for private sector disaster risk insurance, the project will sustainably help strengthen resilience, mitigate the effects of climate change and support economic development through private sector growth. £24.2 million was committed over the reporting period.

The Pacific Catastrophe Risk Assessment and Financing Initiative deploys technical assistance and capital to provide insurance for the Pacific Islands so in future they can protect themselves against natural disasters such as cyclones and Tsunamis, thereby reducing their reliance on humanitarian aid. The nations of Tonga, Marshall Islands, Cook Islands, Vanuatu, and Samoa will benefit from the insurance. £10 million was committed over the reporting period.

Bangladesh's National Urban Poverty Reduction Programme has received £20 million to help ensure rapidly urbanising Bangladesh is ready for climate change. Over 6 million people will benefit from better planned housing and infrastructure that is better protected from floods and extreme weather. £1.7 million was committed over the reporting period.

Future Climate for Africa will enhance the scientific understanding and prediction of climate variability and change in Africa, working with stakeholders to bring this information into use in adaptation planning. The programme funds 4 regional consortia across Africa, with a focus on developing real demonstrations of the use of climate information in practice in areas such as infrastructure, urban plans and national planning. £7.2 million was committed over the reporting period.

Investment from the private sector is an essential part of the equation. AgDevCo is a specialised investor and project developer focused exclusively on early stage Small and Medium Enterprise agribusiness in Sub Saharan Africa. AgDevCo deploys patient capital and technical assistance to build profitable businesses that contribute to food security, drive economic growth and create jobs and income in rural areas and contribute to farmers' resilience to climate change. 1 million people already benefit in rural areas from increased incomes as a result of the jobs and markets created by AgDevCo's investments. 2.3 million people are expected to directly benefit by 2021 in Sierra Leone, Ghana, Rwanda, Malawi, Mozambique, Tanzania, Uganda, Zambia. £30.2 million was committed over the reporting period.

The UK pledged £28 million to the Strengthening Adaptation and Resilience to Climate Change in Kenya Plus programme – supporting scaling up of adaptation products, services and assets and supporting private sector innovation to build resilience to climate impacts. The project supported the production of the Kenya's National Climate Change Action Plan, supporting 2 million people to better cope with climate change and helped establish 2 county level adaptation funds with more in the pipeline. £8.1 million was committed over the reporting period.

The UK has pledged £147.5 million to International Fund for Agricultural Development 'Adaptation for Smallholder Agriculture' programme, helping make it the World's largest climate change adaptation programme focused on smallholder farmers. This programme provides knowledge and best practices to help over 6 million smallholder farmers in up to 43 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; help farmers access markets to sell their crops; to plant trees on farms and introduce soil and water conservation practices; and, enable farmers to access daily and seasonal weather forecasts, such as using text messages, so they know when best to plant and harvest crops. £0.4 million was committed over the reporting period.

Insurance and other forms of risk financing offer a way of providing rapid and predictable responses to disasters. To this end, the UK signed up to the original InsuResilience initiative in 2015. The aim is to increase access to direct or indirect insurance coverage against the impacts of climate change for up to 400 million of the most vulnerable people in developing countries by 2020. Demand, capacity, systems and regulatory environments are binding constraints to building up risk finance markets in developing countries. The UK is addressing these barriers through The London Centre for Global Disaster Protection. The Centre is a £30 million 4-year programme which aims to save lives and help countries get back on their feet quickly after a disaster strikes. It will act as a hub to draw together leading experts from the humanitarian, development and financial sectors internationally in a joint effort.

6.4.6 Crosscutting: Land use change and forestry

Recognising that agriculture, forestry and land use change are responsible for roughly a quarter of global anthropogenic GHG emissions every year, the UK's ICF also supports global efforts to slow, halt and reverse deforestation, and to reduce GHG emissions from land use. Protecting forests also helps deliver important ecosystem services and provides opportunities to protect biodiversity and reduce poverty. The UK works with ambitious governments and private sector stakeholders to address market and failures linked to deforestation.

Together with Germany and Norway, the UK pledged to collectively provide $5 billion between 2015 and 2020 to incentivise governments, companies and communities to protect our largest natural global carbon sinks. UK ICF supports indigenous communities, enhances capacity and provides incentives to reduce emissions from deforestation through government partnerships and results-based finance. ICF crowds in sustainable investments by supporting innovative sustainable farming and forestry businesses, zero-deforestation supply chains for key commodities, carbon-markets and the development of private impact funds.

Forest clearance to cultivate commodities such as palm oil, soy, beef, pulp and paper is the largest driver of deforestation. Meeting global climate and sustainable development goals alongside food security needs will require a new, land-use paradigm that increases agricultural productivity – but not at the expense of forests. The UK has played a key role in brokering ambitious international and multi-stakeholder agreements, such as the New York Declaration on Forests in 2014 and the Leaders' Statement on Forests and Climate Change in Paris, 2015. The UK is also working with private sector stakeholders through the Tropical Forest Alliance 2020 and the BioCarbon Fund.

In 2018, the UK committed £75 million to the Partnerships for Forests programme, which incubates innovative low-carbon farming and forestry practices in South East Asia, Africa and Latin America. The programme catalyses private investment in sustainable forests and land use by supporting public-private-people partnerships that deliver on commitments for deforestation-free commodities, reduce the pressure on forests, and improve livelihoods. £2.8m was committed over the reporting period.

The UK continues to support the Reducing Emissions from Deforestation and Forest Degradation (REDD+) framework, agreed under the UNFCCC to reduce emissions from deforestation and forest degradation and enhance forest carbon stocks in developing countries. The framework aims to demonstrate a new land-use paradigm that delivers large-scale carbon mitigation and sequestration through sustainable forest management. As part of the REDD+ framework, the UK has pledged £141.5 million to the Forest Carbon Partnership Facility (£45m was committed over the reporting period), a results-based fund that pays countries when they can demonstrate that they have reduced emissions from deforestation and forest degradation; £223 million to the Forest Investment Programme, which provides upfront financing for public and private investments in forestry and related sectors across 23 countries and £115 million to the BioCarbon Fund, which supports policy reform and projects to roll out new landscape-wide approaches that produce emission reductions from agriculture, forests and other land use.

The UK committed £73 million to the REDD for Early Movers programme which is an accelerator for the most ambitious countries to reduce emissions from deforestation. REM rewards programmes that are already successful in driving down deforestation, with finance re-invested in agreed activities to deliver further results. This includes strengthening the rights of indigenous communities, increasing the land-efficiency of commercial farming and creating new sustainable forest livelihoods. £42.9m was committed over the reporting period.

The UK has pledged £15 million to support Sustainable Cattle Ranching in Colombia, which provides technical assistance to integrates cattle raising and agroforestry systems across 4000 farms in Colombia, and to shape agricultural methods to increase food production while reducing land degradation, deforestation, biodiversity impacts and GHG emissions from cattle ranching. £260,000 was committed over the reporting period. The Forest Governance, Markets and Climate is a global programme supporting governance and market reforms aimed at reducing the illegal use of forest resources, benefitting poor forest-dependent people and promoting sustainable growth in developing countries. £52.2 million was committed over the reporting period.

The CGIAR is a consortium of 15 independent agriculture research centres operating in around 100 countries globally. Our support enables the CGIAR to scale up its research, contributing to the development of new crop varieties which are more productive and tolerant of biotic and abiotic stress; the development of farming systems which are more resilient, including to the effects of climate change, and more productive; the development of markets and value chains which are better able to deliver benefits to poor people and policies and technology which will directly support better nutritional and health outcomes for the poor. £24 million was committed over the reporting period.

At the 2019 UN Climate action summit, the UK announced a new International Biodiversity Fund, with an initial investment of £220 million, and called for urgent action on biodiversity as part of global efforts to tackle the drivers and impact of climate change. The new International Biodiversity Fund comprises 3 components: a £100 million Biodiverse Landscapes Fund that will help to slow, stop and reverse biodiversity loss in some of the world's most valuable habitats including by pioneering green corridors; £90 million to scale up the world renowned Darwin Initiative to help local communities protect species under threat and preserve their natural habitats; and £30 million to support efforts to tackle the illegal wildlife trade.

6.5 Technology development and transfer

The increasing demand for energy supplies internationally to support sustainable development combined with the urgent need to address the threats of climate change mean that accelerating the deployment of low carbon and energy efficient technologies internationally is essential. Through its ICF programmes and its international engagement, the UK promotes,

facilitates and finances the transfer of technology to developing countries to help address these challenges. Most of the UK's technology transfer support is integrated within the UK's climate finance programmes, recognising the cross-cutting, multi-sectoral needs of developing countries which require integrated support covering technology but also capacity building and finance to ensure they have a positive impact. The below publicly funded programmes have a strong focus on technology development:

In 2017/18, the UK committed an additional £10 million to carbon capture, usage and storage, bringing the total contribution to £70 million. This supports developing countries to build up the technical and institutional knowledge necessary to enable the deployment of CCUS, including supporting the establishment of the necessary regulatory and policy frameworks. CCUS development and deployment is crucial for meeting climate goals, and the UK is the largest multilateral donor to CCUS globally. The UK also has been active internationally in this area, hosting and co-organising high-profile international events including the international CCUS workshop at the Asian Clean Energy Forum in June 2018 and the Global CCUS Summit in November 2018.

Some successful technology transfer examples include the UK Co-financing for a pilot CO2 storage project in South Africa was endorsed by the President of South Africa in November 2017 and signed by the Minister of Finance in February 2018. In Mexico, with UK funding, the first CCUS Centre of Excellence was set up in February 2018 and in China UK financial support has been allocated to CCUS activities, including technical assistance for a full-chain CCUS coal-to-chemical plant.

In December 2018, the UK also announced it would commit £19.2 million to the Energy Sector Management Assistance Programme, which helps developing countries to transition to cleaner energy by providing support to cover a range of technical and advisory services to accelerate the deployment of technology alternatives to coal power generation. The UK's support includes funding for an expert to enable ESMAP to respond to increase demand for technical capacity for offshore wind and to build an investment pipeline.

In 2018, the UK pledged an additional £3.5 million to extend the 2050 Calculator programme, bringing the total UK contribution to £6.2 million. This programme supports developing countries to create interactive and easy-to-use energy models based on the original calculator created by the UK government, thereby helping to support energy planning and improve understanding of pathways for clean energy transitions. It can be used by governments to explore options, consult stakeholders, and develop strategies, and has already been used by 10 countries since 2012. £250,000 was committed over the reporting period.

Completed Calculators are having a clear policy impact and demonstrated the success of technology transfer. Four countries (India, Vietnam, Colombia and Nigeria) have used their Calculator models in the formulation of their NDCs for the Paris Agreement. In 2017, the Government of India used theirs in the development of their new National Energy Policy.

The UK also continues to be the largest donor to the Clean Technology Fund through its contribution to the CIF. The Clean Technology Fund supports technology development and transfer internationally, by providing concessional finance to support the deployment of technologies in developing countries, focusing on renewable energy, energy efficiency and clean transport. The Clean Technology Fund has almost fully committed its resources and the UK is participating in discussions on the future of the fund. The UK has continued to support the idea of establishing a Clean Technology Fund 2.0, which could use existing assets to raise an estimated $3-5 billion, mobilise additional private finance and contribute significantly to the $100 billion goal.

At the UN Climate Action Summit in September 2019, the Prime Minister launched the £1 billion Ayrton Fund. This aid funding will support scientists from around the world, working in partnerships with developing countries to drive the clean energy transition and reduce

emissions. Through research, development and demonstration of new solutions and business models, the fund will strengthen capacity and unlock opportunities in developing countries for cleaner growth and better access to clean energy. Alongside this commitment, the UK will provide £200 million to drive forward the use of energy storage technology in developing countries. This will be deployed through a new Global Energy Storage Programme delivered through the Clean Technology Fund.

The SUNRISE network, which unites several leading universities and industrial collaborators from the UK and India in a transdisciplinary research collaboration. This international network helps develop and implement the technology necessary to build a minimum of 5 solar-powered building demonstrators in rural India. £1.4 million was committed over the reporting period. All UK ICF funded programmes are required to have bespoke monitoring frameworks (logframes, annual reviews and results collection), including programme specific results indicators. The UK uses these monitoring frameworks to ascertain and measure the performance of each programme. Annual Reviews are one of our key tools to monitor the progress of our programmes, as part of UK efforts to ensure continuous improvements, and as a formal control point in the programme cycle. In line with ODA transparency requirements, all annual reviews and logframes are published on the UK Development Tracker (https://devtracker.fcdo.gov.uk/). Information on UK ICF funded programmes, including those supporting technology transfer, can be found via Devtracker.

6.5.1 Securing policy commitments to accelerate low carbon technology deployment

In addition to specific programmes, the UK continues to use its influence internationally in key fora and institutions to build increased policy commitments, interventions and high-level actions to encourage the promotion of low carbon technologies. In 2019, the UK joined the new Energy Storage Partnership, which brings together multilateral agencies, governments, research institutions, industry associations and philanthropies working collaboratively to promote energy storage solutions tailored to the needs of developing countries' power systems. The partnership will provide technical research and data to inform the World Bank Group's $1 billion battery storage investment programme announced in September 2018. The UK has nominated several organisations to participate in the partnership including the Faraday Institute, the Low Carbon Energy for Development Network, Innovate UK and the National Physical Laboratory.

The UK also continues to play an active leadership role in Mission Innovation, the key intergovernmental platform to accelerate clean energy innovation to deliver affordable low carbon solutions. The UK has committed to double its public sector clean energy research, development and deployment spend to £ 400 million by 2020/2021, including at least £100 million on projects that will help to address the clean energy needs of developing countries. The UK is currently Head of Secretariat for Mission Innovation, participates in all eight of the innovation challenges and co-leads the Carbon Capture, Utilisation and Storage and the Affordable Heating and Cooling of Buildings Innovation Challenges. The UK is an active participant in discussions about how Mission Innovation can continue to accelerate clean energy innovation beyond the end of the first phase of its mandate in 2020.

The UK has played a key role in supporting the International Energy Agency's (IEA) increasing focus on low carbon energy technology, including through supporting their flagship

Energy Technology Perspectives analysis. The UK also supports various IEA Technology Collaboration Programmes and is contributing £8 million to the IEA's Clean Energy Transitions Programme, which provides cutting edge technical and policy support across the full range of energy policy areas relevant to the low carbon energy transition.

The UK is an active member of the Clean Energy Ministerial, a forum to promote and share lessons learned from policies and programmes that advance clean energy technology. The UK is a member of many of the CEM's initiatives including the initiative on Super-Efficient Equipment and Appliance Deployment.

6.6 Capacity building

Building lasting capacity is key to the transformational change needed to address climate change, and many ICF programmes include capacity building elements. Following extensive research on best practice and feedback from developing countries, the UK understands that capacity building support should be:

- Country-led, responding to local demand and tailored to local context, reflecting local capacity and social norms and building upon existing national processes and institutions;
- Flexible, able to adapt to evolving circumstances and priorities in country; and
- Sustainable, ensuring capacity is built and sustained in the longer-term.

The UK has an extensive network of officials based in developing countries. This ensures close relationships with governments and key organisations in these countries and the development of bilateral programmes based on developing country needs. Much of the UK's capacity building support is integrated within climate finance programmes, recognising the cross-cutting, multi-sectoral needs of developing countries which require integrated support. The below programmes have been selected for their strong focus on capacity building.

6.6.1 Capacity building for mitigation

The UK supports several programmes which aim to deliver technical assistance to developing countries to support mitigation action, in multiple areas including finance and technology.

The Clean Energy Fund Technical Assistance programme is a £19.5 million programme aiming to improve energy access, to ensure energy security and to transition to low carbon technologies through cost-effective investments that contribute to GHG mitigation, by using technical assistance in the Asia-Pacific region. This capacity building supports the effective development and transfer of low-carbon technologies.

The UK supports the Global Innovation Lab through its £2 million contribution, an international forum of experts from donor governments and the private sector that was brought together to accelerate investment in innovative ideas on climate finance. The board of experts scrutinise innovative climate finance projects and help develop them by attracting private sector investment, helping to close the gap of knowledge between governments and the private sector and make it easier for the private sector to invest. So far, it has endorsed 35 instruments across the Global, India and Brazil Labs, and catalysed over $1.4 billion of investment, with one third of this coming from private sector investors.

The UK is a member of the NDC Partnership and contributed £2 million to the programme which aims to help turn NDCs into specific strategies and measures, raising ambition globally by enhancing cooperation and support for the successfully implementation of the Paris Agreement and Sustainable Development Goals. The programme provides guidance to support countries, intergovernmental organisations, civil society and the private sector to align their plans and action to achieve the NDCs, and helps to identify possible sources of finance, tools and key data for those who need it while also providing a way for increasing transparency and for sharing lessons and experiences. UK funding has enabled the development of knowledge products and tools for climate action – such as the climate toolbox and climate finance explorer – and has supported the knowledge portal and its recent redesign.

In June 2018, the UK announced UK PACT, a new dedicated technical assistance programme to respond to the critical global need for capacity building to address the gap between NDC targets and their implementation. UK PACT works bilaterally with partner countries to deliver demand-led, flexible Technical Assistance in line with country priorities and in areas of UK

expertise, such as green finance, climate legislation and clean energy. The UK recognises the importance of demand-driven, sustainable capacity building, and UK PACT is designed to reflect this, for example through in-country staff to reflect country priorities and by embedding UK staff through secondments to ensure longer term support. Country demand is matched with technical assistance and skills shares, remaining flexible and adaptative as programmes develop.

The UK has committed £60 million to the programme from 2018-2021. £8.4 million has already been invested in an impactful portfolio of projects in Mexico, Colombia and China, and the programme will scale up over the next year. In 2020, PACT will also launch a £12 million Challenge Fund to tackle some of the biggest challenges developing countries face in accelerating their low carbon transitions. Open to all ODA eligible countries, this flexible technical assistance vehicle will have 6 geographically and thematically focused funding windows to ensure the development of an impactful portfolio of projects that are well targeted to the needs of different regions.

6.6.2 Capacity building for adaptation

The Collaborative Adaptation Research Initiative programme (CARIAA), funded jointly with the International Development Research Centre (IDRC) Canada, aims to generate robust evidence to inform policy and practice to increase the resilience of vulnerable populations and their livelihoods in three climate change 'hot spots' across Africa and Asia. The programme has performed well overall, exceeding output milestones and coming in on budget and on time. Notable achievements include a significant contribution to the recent IPCC Special Report on the implications of global warming of +1.5C, with multiple CARIAA papers cited. New and strengthened relationships with key stakeholders and networks have contributed to increased recognition and uptake of CARIAA research results, with an excess of 30 documented examples of contributions to policy and planning activities at local, national and international scales. CARIAA was responsible for developing the expertise of some organizations around topics that they did not previously address, such as climate change and migration. Moreover, the collaborative structure of the consortium also helped some organizations gain international exposure and experience, improve the quality of their research to meet global standards, and gain international recognition. £12.2 million was committed over the reporting period.

WISER is a £35 million, five-year programme designed to enhance the resilience of African people and Africa's economic development to weather-related shocks. The programme aims to improve the generation and use of Weather and Climate Information and Services (WCIS) across Sub-Saharan Africa, with an initial focus on East Africa. There is strong rationale for working regionally as climate change is a cross-border issue and so a regional approach offers greater efficiencies in the pursuit of common national objectives[88]. Addressing the impact of climate change and supporting improved decision making are important, as is improved use of science and research in decision making. There has been good progress with implementing plans and joint studies and WISER is producing good, high quality and relevant outputs (e.g. case studies, joint analysis) and starting to share this across various networks. There has also been very good progress on sharing outputs across key fora and the development, and engagement with a broad number of varied networks, as well as training provided to many individuals and good, broader engagement across a range of stakeholder groups. £9.2 million was committed over the reporting period.

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88 2015 ARD Macro-Evaluation of Regional Approaches (MERA) regional rationales: (a) tackling cross-border issues, (b) maximising reach and impact, and (c) greater efficiencies in the pursuit of common national objectives.

Building Resilience and Adaptation to Climate Extremes and Disasters is a £110 million programme which aims to improve local and national policies and institutions to better integrate disaster risk reduction, climate adaptation and development approaches. It has started community level initiatives in 13 countries through 15 NGO consortia, working on projects such as improved climate information for agriculture, securing livestock migration routes, and building infrastructure to help crops avoid flood and capture water for future use. £64 million was committed over the reporting period.

The Building Resilience in Ethiopia programme builds resilience to shocks by supporting the Government of Ethiopia to lead an effective and accountable humanitarian response system in the most effective way. It has 4 key strands: technical assistance to the Government of Ethiopia to lead and deliver an effective and accountable humanitarian response, delivering food and cash to people in humanitarian need; responding to emergency humanitarian needs, and; monitoring, evaluation and learning to strengthen delivery. £28.5 million was committed over the reporting period.

The UK has also pledged £4.8 million to the Climate Impacts Research Capacity and Leadership Enhancement programme, which is developing the capacity of African scientists to conduct research on the impacts of climate change. The programme provides 1 year visiting fellowships for early stage climate change researchers where they receive professional and technical support from host institutions and undertake original research which is published in peer-reviewed journals. The programme also provide support to their home institutions through an institutional strengthening programme, to strengthen research training programmes, mentoring and quality assurance systems. 50% of fellows have been women.

6.6.3 Capacity building for technology transfer

The UK adopts an integrated approach to supporting developing countries, and therefore recognises that technology transfer and capacity-building are interlinked and that both are necessary to effectively respond to the priorities of developing countries. The UK Government has funded several initiatives to support capacity building in the area of technology.

The UK's Newton Fund aims to develop science and innovation partnerships that promote development and has supported several projects supporting collaboration and capacity building for technology transfer. For example, 2018 winners of the Newton Prize Fund include a collaboration between Surrey University and the University of Antioquia in Columbia on a research project to develop a method for turning waste water from coffee processing into electricity using microbial fuel cell, preventing waste water entering and contaminating water courses; and a programme between scientists in the UK and Chile to use models to develop a framework to strengthen energy infrastructure to withstand extreme weather and natural disasters.

6.6.4 Capacity building for negotiations

In addition to wide-ranging support for mitigation, adaptation and cross-cutting activities, the UK provides support developing countries to develop negotiations capacity and capability internationally. Over the reporting period the UK has provided £1 million funding for Negotiations Support Programmes and £15.6 million to the Climate Ambition Support Alliance. Formerly known as CABIN, this programme aims to level the playing field in international climate change negotiations by providing expert legal and technical support to developing country negotiators, while also offering logistical support to enable sufficient representation at key events.

In 2017/18, the UK also supported Fiji as the first Small Island Developing State to hold the UNFCCC COP Presidency, providing £1.7 million of funding to the Fijian Government. In addition, the UK supported the Climate Development Knowledge Network and provided up to £2 million in 2017 to enable effective participation of the poorest developing nations in the UN Climate Negotiations.

The UK also pays mandatory subscriptions to the UNFCCC to contribute to ensuring an effective Secretariat, as well as voluntary contributions to fund priority activities. These include the UNFCCC Trust Fund for Supplementary Activities, the UNFCCC Trust Fund for Developing Country Participation and the UNFCCC additional intersessional meetings. As a member of the IPCC, the UK also makes voluntary contributions to the IPCC's Trust Fund. The UK contributed £230,000 in 2017 and £115,000 in 2018 and has committed a further £115,000 for 2019.

The UK provides small scale funding to help contribute to the costs of the Organisation for Economic Co-operation and Development (OECD) Climate Change Experts Group programme and to provide small-scale targeted support to the most progressive and vulnerable countries in the negotiations, including through the Cartagena Dialogue.

6.7 Actions to accelerate the alignment of finance flows and raise ambition

6.7.1 ODA alignment

Beyond the UK's core £5.8 billion ICF, the UK continues to provide support for climate action in developing countries via other channels, with considerably more UK Official Development Aid contributing indirectly to helping developing countries respond to climate change. In the UK Government's recently published Green Finance Strategy, the Government committed to aligning all UK ODA with the Paris Agreement, to ensure that development finance is consistent with climate resilient and low emissions development pathways. This will cover the entire of UK ODA, which is enshrined in law as being at least 0.7% GNI.

Beyond dedicated climate finance, the UK also remains one of the largest contributors to the multilateral development banks (MDBs) which have collectively committed almost £200 billion in climate finance over the last 7 years, with 2017 seeing a 28% increase (to $35 billion) in collective multilateral development bank finance provision compared to 2016. The UK is also the largest donor to the International Development Association (part of the World Bank providing finance to the poorest countries) and committed £3,336 million to its 18th replenishment. The UK continues to encourage increased ambition on climate across the multilateral development banks, through partnering on dedicated ICF programmes, actively participating in Board project approvals, and influencing overall strategy, particularly regarding 2020 climate finance commitments and plans for aligning all activity with the goals of the Paris Agreement. The UK continues to support the use of these funds in response to projects and plans driven by the needs of developing countries and in line with NDCs and long-term climate strategies, as well as promoting increased effectiveness and transparency.

6.7.2 Accelerating ambition and implementation internationally

The UK recognises the importance of increasing global climate ambition and action in order to meet the goals of the Paris Agreement. By taking action domestically, the UK is able to demonstrate leadership and share this expertise to support other countries to do the same. In addition to the programmes listed above, the UK also undertakes a number of activities which indirectly support developing country ambition.

In 2017, the UK and Canada launched the PPCA, a global alliance uniting government, business and organisations in taking action to accelerate clean growth and climate protection through the rapid phase-out of traditional coal power. The alliance is approaching 100 members globally, including 30 national governments, all committed to moving away from coal towards cleaner power sources, and the UK is continuing to build this momentum international.

The UK continues to play a leading role in accelerating the global growth of green finance. Building on previous leadership outlined in previous Biennial Reports, in September 2017, the UK established a Green Finance Taskforce, to bring together thinking around accelerating the growth of green finance. In response to the recommendations of the taskforce, the UK established a new Green Finance Institute, jointly funded by the UK Government and the City of London. In July 2019, the UK also published its Green Finance Strategy, setting out green finance objectives and ambitions and how these will be achieved.

The UK continues to support the Montreal Protocol, a global agreement to protect the ozone layer. The UK contributes to the Montreal Protocol's Multilateral Fund to help developing countries to phase out ozone depleting substances and hydrofluorocarbons (HFCs), which both protects the ozone layer and mitigates climate change. In November 2017, the UK was also one of the first countries in the world to ratify the Kigali Amendment to the protocol aimed at phasing down production and usage of HFCs to avoid up to 0.5°C of warming by the end of the century.

6.8 Monitoring and evaluation, lessons learnt and transparency

Designing effective programmes that respond to the needs of developing countries is a priority of UK ICF. The UK draws on evidence from commissioned studies and from its extensive monitoring and evaluation framework to enable continuous improvements in project selection, design and implementation.

6.8.1 Monitoring and evaluation

The UK's monitoring and evaluation framework assesses the performance of the ICF against intended outcomes and supports the generation and use of evidence across the ICF to allow for continuous improvement. The cross-departmental ICF monitoring and evaluation framework includes programme and portfolio results reporting frameworks, internal annual reviews of all programmes, and several independent evaluations at both programme and portfolio level.

The monitoring aspect of the framework consists of both portfolio-wide metrics known as Key Performance Indicators and programme specific data collected through logframes and programme specific indicators. The Key Performance Indicators are defined metrics which are aggregated and publicly report at portfolio level. These are listed on the UK Government website, along with their full methodologies[89]. Programme level metrics are designed specifically for each programme, and these are published on the UKs Development Tracker website.

Each year all programmes receiving International Climate Finance from HMG under-go an annual review process, whereby logframe indicators are collected, assessed and KPI data is quality assured. The programme manager leads this process and reflects on evidence

[89] DFID, UK Climate Finance Results (2019) https://www.gov.uk/government/publications/uk-climate-finance-results

generated over the year – for example any evidence from independent evaluations. The process is core to our learnings as it provides a moment of periodic reflection whereby lessons can be taken and applied across the whole portfolio.

The UK's monitoring and evaluation framework increases the impact of climate finance by filling key evidence gaps. It achieves this through the following objectives:

- Evaluate and monitor programmes to understand why, how and in what contexts our programmes are successful (or otherwise) in achieving their aims;
- Develop and use the evidence base to improve decision-making within HMG and influence the wider climate finance landscape; and
- Provide accountability for our ICF through understanding whether programme results are being achieved.

The evaluation aspect of the framework ensures independent scrutiny and learning from a range of commissioned evaluations. At portfolio level, independent evaluations are carried out through the ICF Monitoring, Evaluation and Learning programme, which provides evidence and learning to increase the effectiveness and to measure the impact of the UK's international climate funding. At individual programme level, the UK commissions independent evaluations specifically targeted at individual programmes. For example, in 2018 the UK published an independent evaluation of our Renewable Energy Performance Platform[90].

The UK's ICF welcomes regular scrutiny from both the UK's Independent Commission on Aid Impact[91] and the International Development parliamentary oversight committee[92]. In particular, the UK's monitoring and evaluation framework has been well regarded by the UK's Independent Commission on Aid Impact, which stated in the 2019 review that: "The UK has made an important contribution to promoting better results measurement across the international climate finance architecture", and that "the UK has been a consistent champion of results measurement […] encouraging its multilateral partners to develop results frameworks and strengthen their monitoring and evaluation processes." The Commission also noted that "other actors in the climate finance area look to the UK as a thought leader on the monitoring and evaluation of climate finance."

6.8.2 Lessons learnt and evidence-based programming

Evidence is critical to designing climate finance programmes effectively and to ensure they deliver the greatest impact and respond effectively to the needs of developing countries. Evidence generated through the UK's monitoring and evaluation process is fed back into programme and portfolio level design decisions through the annual review process which all programmes undertake, management responses to evaluations recommendations, and analytical appraisal for future programming.

Two of the key lessons learnt from this process of evaluation was that technical assistance is crucial for longer term sustainable development and success requires local buy-in and commitment. The UK's Sustainable Infrastructure Programme was designed to reflect these lessons through its combination of technical assistance to address technical or regulatory barriers and investment capital. Experience demonstrates that when working together,

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[90] Trinomics, Mid-term evaluation of Renewable Energy Performance Platform (REPP) https://trinomics.eu/project/mid-term_evaluation_of_renewable_energy_performance_platform/

[91] UK aid for combating climate change inquiry https://icai.independent.gov.uk/report/international-climate-finance/

[92] UK aid for combating climate change https://www.parliament.uk/business/committees/committees-a-z/commons-select/international-development-committee/inquiries/parliament-2017/uk-aid-for-combating-climate-change/

these tools create the greatest opportunities to leverage public and private investment. To ensure that interventions are demand-led and sustainable, this programme works in close collaboration with partner governments and supports national plans.

The ICF portfolio has also yielded important lessons learnt around ensuring effective and efficient project implementation. The UK has been deploying these lessons in the following ways:

- Through the NAMA Facility, the UK identified that countries require greater support for the detailed project preparation phase, to increase the chances of projects progressing successfully through implementation; and
- Through the multilateral funds, such as the Climate Investment Funds, the UK has learned the value of flexible programming to respond to in-country circumstances such as shifts in the costs of technologies.

In addition to the evidence base drawn from the existing ICF portfolio, the UK's Knowledge, Evidence and Engagement Portfolio supports the development of effective climate finance by funding commissioned research to inform the focus and design UK ICF programmes and to build on lessons learned. The programme has helped to develop an evidence base on how to devise interventions that can be transformational and effectively respond to the needs and priorities of developing countries, and how to maximise the impact of UK support to ensure it delivers climate, poverty reduction and economic outcomes. The UK has pledged £18 million over 2018-21 to Knowledge, Evidence and Engagement Portfolio.

The UK also funded the CIF Evaluation and Learning Initiative, which has drawn out learning from the last 10 years of CIF programmes, identifying the transformational impacts these have helped bring about and providing useful lessons for funds across the climate finance landscape.

6.8.3 Reporting and transparency

The UK has an ambitious aid transparency policy ensuring all aid spend data including climate finance, is published and externally assessed to international standards.

In particular, the UK is committed to a conservative and accurate approach to climate finance accounting, giving confidence to developing countries and civil society that the levels of climate-specific support reported accurately reflect the levels of climate-specific support provided. A specific example is our world leading approach to calculating the level of climate finance associated with integrated development projects. Rather than using a standardised co-efficient for calculating this, as most providers of support do, the UK calculates the specific climate related cost of each programme on a case by case basis, reflecting the real contribution of each activity to meeting climate goals.

The UK also works closely with the OECD in reporting climate finance and reports annually to meet the requirements under Article 16 of the EU GHG Monitoring Mechanism Regulation.

In addition, the UK is committed to the avoidance of double counting, having played a key role in developing the Technical Working Group methodology used to enable OECD-CPI analysis of aggregate mobilisation of private finance. The UK is also committed to developing the evidence base on how public finance and policy measures can attract and measure private finance, including through participating in the OECD Research Collaborative for Tracking Private Finance.

Annex 1: Common Tabular Format Tables supporting the UK's fourth 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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
	kt CO_2eq																													*(%)*
CO_2 emissions without net CO_2 from LULUCF	60,1480.56	601,480.56	609,307.74	593,748.10	579,700.11	575,832.96	567,353.52	589,063.32	562,980.06	568,148.01	561,198.18	567,901.86	576,720.67	560,803.39	572,282.26	573,786.44	570,496.68	568,098.12	559,915.61	545,411.80	494,890.21	512,672.50	470,413.81	488,341.12	478,459.35	439,580.09	423,122.05	400,554.10	388,101.10	-35.48
CO_2 emissions with net CO_2 from LULUCF	599,468.36	599,468.36	606,744.11	590,420.33	575,951.10	571,944.94	563,420.61	584,307.35	557,636.58	562,117.81	555,591.24	561,910.30	570,054.02	553,264.94	564,420.42	565,234.23	561,543.46	558,645.24	549,881.92	534,940.50	484,463.41	501,957.99	459,256.84	477,730.28	467,595.57	428,504.30	411,944.19	389,287.91	376,771.27	-37.15
CH_4 emissions without CH_4 from LULUCF	132,990.63	132,990.63	133,748.47	133,409.03	131,767.19	124,890.60	126,394.41	125,516.85	123,192.73	119,685.31	114,123.00	108,900.57	104,044.03	101,590.97	96,389.49	92,082.35	87,360.16	82,970.02	79,095.13	73,503.62	68,974.26	64,297.74	61,606.85	59,973.03	55,883.64	53,685.75	53,088.63	51,507.70	51,884.16	-60.99
CH_4 emissions with CH_4 from LULUCF	133,006.57	133,006.57	133,766.41	133,423.19	131,782.38	124,905.50	126,421.98	125,537.84	123,217.12	119,704.91	114,138.69	108,929.87	104,072.38	101,619.64	96,445.54	92,111.87	87,396.29	83,001.04	79,136.47	73,534.22	69,008.57	64,332.64	61,640.34	60,031.97	55,908.68	53,716.87	53,108.57	51,541.10	51,912.53	-60.97
N_2O emissions without N_2O from LULUCF	46,128.03	46,128.03	46,339.43	41,415.50	37,169.64	37,785.32	36,530.57	36,515.49	36,763.98	36,733.49	27,204.04	26,554.23	25,066.48	23,433.40	23,002.64	23,582.71	22,716.09	21,614.36	21,674.39	21,033.33	19,580.52	19,913.10	19,166.40	18,999.07	18,909.59	19,455.53	18,988.93	18,912.12	19,270.63	-58.22
N_2O emissions with N_2O from LULUCF	48,379.73	48,379.73	48,575.97	43,633.25	39,377.23	39,980.75	38,724.58	38,693.49	38,934.90	38,892.25	29,351.24	28,641.84	27,088.17	25,396.46	24,936.60	25,434.04	24,518.34	23,364.04	23,382.91	22,679.34	21,181.36	21,482.95	20,715.12	20,547.22	20,406.15	20,935.49	20,434.92	20,346.03	20,679.40	-57.26
HFCs	14,391.43	14,391.43	14,991.05	15,597.64	16,505.70	17,593.46	19,096.14	20,249.43	23,104.75	20,074.67	11,466.00	9,884.20	10,893.60	11,391.62	12,829.68	11,909.73	13,132.36	14,047.00	14,496.86	14,992.01	15,622.46	16,486.51	14,934.26	15,481.09	15,808.01	16,002.40	15,987.77	15,216.05	14,192.82	-1.38
PFCs	1,651.53	1,651.53	1,385.14	690.35	602.73	611.39	596.94	596.36	503.11	493.73	473.96	596.79	485.59	408.23	356.61	433.85	385.15	387.67	287.84	266.25	197.33	287.71	416.94	255.05	318.74	278.31	327.23	353.94	371.47	-77.51
Unspecified mix of HFCs and PFCs	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	NO	NO	NO	NO	0.00
SF_6	1,305.31	1,305.31	1,346.64	1,388.22	1,214.71	1,257.12	1,299.96	1,343.14	1,316.14	1,363.09	1,530.12	1,847.78	1,481.62	1,519.52	1,343.38	1,137.47	1,074.26	897.88	852.32	696.10	605.74	702.79	622.21	602.84	522.05	500.32	465.21	490.59	525.41	-59.75
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	0.40	0.44	0.48	0.53	27.83
Total (without LULUCF)	797,947.89	797,947.89	807,118.94	786,249.39	766,960.72	757,971.58	751,272.37	773,285.55	747,861.87	746,499.57	715,996.76	715,687.11	718,693.02	699,148.15	706,205.02	702,933.15	695,164.99	688,015.34	676,322.44	655,903.39	599,870.78	614,360.62	567,160.79	583,652.53	569,901.74	529,502.81	511,980.26	487,034.99	474,346.12	-40.55
Total (with LULUCF)	798,203.35	798,203.35	806,809.80	785,153.51	765,434.48	756,293.89	749,561.03	770,728.57	744,713.71	742,647.73	712,552.70	711,812.46	714,076.41	693,601.44	700,333.19	696,261.79	688,050.14	680,343.15	668,038.60	647,108.69	591,079.12	605,250.86	557,586.02	574,648.77	560,559.55	519,938.08	502,268.32	477,236.10	464,453.44	-41.81
Total (without LULUCF, with indirect)	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	NA	NA	NA	NA	0.00
Total (with LULUCF, with indirect)	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	NA	NA	NA	NA	0.00

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	2014	2015	2016	2017	Change from base to latest reported year
	kt CO_2 eq																													(%)
1. Energy	615,267.74	615,267.74	625,927.49	609,930.08	594,572.73	581,025.93	572,997.54	591,962.15	566,578.20	569,409.04	559,602.76	565,974.40	575,259.83	558,970.75	566,672.31	566,349.59	562,536.10	560,330.44	549,833.95	536,623.53	491,596.82	507,760.17	466,015.66	484,115.14	471,514.26	432,273.29	416,102.28	394,601.31	381,802.83	-37.95
2. Industrial processes and product use	66,557.52	66,557.52	64,781.84	60,375.09	57,000.61	60,315.13	60,857.72	62,955.74	64,165.19	60,769.66	42,737.41	40,618.70	38,817.35	37,068.09	39,366.85	40,495.95	39,675.12	38,887.92	41,238.14	39,476.57	32,825.85	35,576.30	32,059.82	32,402.82	34,504.17	34,217.22	33,718.83	30,875.96	30,330.49	-54.43
3. Agriculture	49,173.86	49,173.86	48,875.87	48,222.62	47,196.19	48,156.49	47,954.35	48,590.59	47,876.46	48,078.03	48,148.45	45,926.29	43,462.10	43,183.64	44,033.15	44,140.59	43,596.43	42,583.22	42,072.57	41,087.52	40,767.60	40,914.35	41,004.79	40,629.90	40,427.63	41,793.33	41,173.05	41,192.07	41,549.10	-15.51
4. Land Use, Land-Use Change and Forestryb	255.46	255.46	-309.14	-1,095.87	-1,526.24	-1,677.69	-1,711.33	-2,556.98	-3,148.17	-3,851.84	-3,444.05	-3,874.65	-4,616.61	-5,546.71	-5,871.83	-6,671.37	-7,114.85	-7,672.18	-8,283.84	-8,794.70	-8,791.66	-9,109.75	-9,574.76	-9,003.76	-9,342.19	-9,564.72	-9,711.94	-9,798.88	-9,892.68	-3972.52
5. Waste	66,948.77	66,948.77	67,533.75	67,721.59	68,191.17	68,474.02	69,462.76	69,777.07	69,242.03	68,242.84	65,508.13	63,167.73	61,153.74	59,925.66	56,132.71	51,947.03	49,357.35	46,213.76	43,177.78	38,715.78	34,680.50	30,109.80	28,080.52	26,504.67	23,455.68	21,218.97	20,986.10	20,365.65	20,663.70	-69.14
6. 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	NO	NO	NO	NO	0.00
Total(includingLULUCF)	798,203.35	798,203.35	806,809.80	785,153.51	765,434.48	756,293.89	749,561.03	770,728.57	744,713.71	742,647.73	712,552.70	711,812.46	714,076.41	693,601.44	700,333.19	696,261.79	688,050.14	680,343.15	668,038.60	647,108.69	591,079.12	605,250.86	557,586.02	574,648.77	560,559.55	519,938.08	502,268.32	477,236.10	464,453.44	-41.81

Table 1(a)
Emissions trends CO_2

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															%
1. Energy	574,309.70	574,309.70	584,462.62	569,018.08	555,645.90	549,432.12	540,423.97	561,094.51	537,791.28	543,146.59	536,175.13	544,400.67	555,033.54	539,571.08	549,034.72	549,167.49	547,190.96	545,907.39	536,036.02	523,473.25	478,784.38	495,061.30	453,761.40	471,681.02	460,179.97	421,381.23	405,592.14	385,125.77	372,285.99	-35.18
A. Fuel combustion (sectoral approach)	566,833.21	566,833.21	577,436.94	561,758.17	548,063.68	541,680.97	531,257.75	551,630.24	530,172.63	535,933.14	529,984.74	538,523.88	548,926.13	533,780.26	543,543.72	543,701.23	541,178.37	540,764.65	530,705.60	518,846.33	473,964.06	490,366.66	449,364.95	467,961.41	456,055.91	417,033.92	400,985.69	380,603.47	367,695.81	-35.13
1. Energy industries	235,851.47	235,851.47	233,624.69	222,494.73	206,473.27	204,633.69	202,380.07	204,220.61	191,890.20	197,689.94	188,510.86	199,263.15	209,710.32	208,064.01	215,686.31	213,684.93	214,037.15	220,219.99	215,081.75	209,472.20	186,331.48	193,640.88	179,555.77	190,683.41	178,500.07	153,781.09	134,087.31	112,012.49	102,629.11	-56.49
2. Manufacturing industries and construction	95,723.43	95,723.43	98,851.91	96,161.73	93,526.92	92,651.33	89,327.72	90,276.47	89,412.91	88,374.00	9,0311.62	9,0273.15	87,934.40	79,377.22	80,799.91	79,716.17	80,592.09	78,865.77	77,119.31	72,282.92	62,274.24	62,236.56	57,522.72	57,270.33	57,683.65	57,420.70	55,080.72	51,352.80	51,175.55	-46.54
3. Transport	119,742.52	119,742.52	118,905.30	120,297.54	121,552.06	122,906.50	122,317.73	126,976.44	128,299.77	128,095.43	129,317.30	127,977.66	127,744.90	130,259.32	129,654.50	130,959.71	131,945.37	131,485.90	132,826.71	127,262.30	122,646.13	120,849.09	118,891.41	117,990.77	116,755.03	118,276.08	120,827.13	123,314.86	123,345.32	3.01
4. Other sectors	110,222.36	110,222.36	121,753.65	118,709.08	122,363.12	117,522.81	113,339.09	126,344.71	116,932.95	118,575.46	118,690.57	118,088.95	120,610.34	113,019.19	114,236.48	116,282.85	111,760.59	106,729.80	101,926.97	106,575.08	99,730.78	110,744.98	90,642.95	99,494.07	100,828.46	85,533.94	89,328.44	92,376.25	88,987.64	-19.27
5. Other	5,293.44	5,293.44	4,301.40	4,095.09	4,148.31	3,966.64	3,893.13	3,812.02	3,636.80	3,198.32	3,154.39	2,920.97	2,926.18	3,060.52	3,166.53	3,057.57	2,843.16	3,463.19	3,750.86	3,253.83	2,981.42	2,895.15	2,752.10	2,522.82	2,288.70	2,022.12	1,662.09	1,547.07	1,558.20	-70.56
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	9,464.26	7,618.65	7,213.45	6,190.39	5,876.79	6,107.40	5,790.82	5,491.00	5,466.26	6,012.59	5,142.74	5,330.42	4,626.91	4,820.32	4,694.64	4,396.45	3,719.61	4,124.06	4,347.31	4,606.44	4,522.30	4,590.18	-38.61
1. Solid fuels	1,698.56	1,698.56	1,312.14	1,122.56	1,022.21	791.77	737.42	552.48	629.34	294.79	214.74	192.99	198.95	194.14	185.41	228.21	161.26	192.04	246.24	324.95	239.62	296.63	379.67	148.54	278.37	435.48	451.88	349.01	359.54	-78.83
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	6,989.32	6,918.66	5,975.65	5,683.81	5,908.46	5,596.69	5,305.59	5,238.05	5,851.33	4,950.70	5,084.18	4,301.96	4,580.70	4,398.01	4,016.78	3,571.07	3,845.68	3,911.83	4,154.56	4,173.29	4,230.64	-26.78
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	NO	NO	NO	NO	0.00
2. Industrial processes	24,527.37	24,527.37	22,217.24	22,199.14	21,993.63	24,151.50	24,726.08	25,704.57	24,034.22	23,406.19	23,357.77	22,203.46	20,570.47	19,958.49	21,258.54	22,534.30	21,291.73	20,318.45	21,925.54	20,063.58	14,322.81	15,892.56	14,818.75	15,030.26	16,866.69	16,427.25	16,010.13	13867.30	14273.11	-41.81
A. Mineral industry	9,803.78	9,803.78	8,050.66	7,544.13	7,578.60	8,657.52	8,748.48	9,071.17	9,395.29	9,569.41	8,972.77	8,851.18	8,418.86	8,442.53	8,485.07	8,756.09	8,711.26	8,716.30	9,009.47	7,851.22	5,681.06	5,984.18	6,346.51	6,062.58	6,430.07	6,562.43	6,627.85	6,326.36	6,249.48	-36.25
B. Chemical industry	6,770.09	6,770.09	7,257.83	7,226.62	7,197.99	7,471.54	7,515.42	7,500.51	6,671.85	6,782.61	7,175.08	6,604.51	6,295.07	6,108.27	6,385.60	6,417.22	6,214.75	5,721.56	6,414.70	5,523.05	4,883.61	5,226.72	4,617.14	5,260.38	4,801.98	4,199.48	4,613.56	4,537.25	4,931.56	-27.16
C. Metal industry	7,400.69	7,400.69	6,399.35	5,919.96	5,522.91	6,338.45	6,856.43	7,051.08	6,464.31	6,034.57	6,687.78	6,154.70	5,302.19	4,311.57	5,278.33	5,484.86	5,849.78	5,400.42	6,045.55	5,973.27	3,352.60	3,573.43	3,098.68	3,017.29	4,994.16	4,857.64	4,423.18	2,480.86	2,572.86	-65.23
D. Non-energy products from fuels and solvent use	552.81	552.81	509.40	1,508.42	1,694.13	1,683.98	1,605.74	2,081.81	1,502.77	1,019.61	522.14	593.06	554.35	1,096.12	1,109.52	1,876.13	515.94	480.17	455.82	716.05	405.54	1,108.24	756.42	690.01	640.47	807.70	345.54	522.83	519.22	-6.08
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	NO	NO	NO	NO	0.00
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	NE,NO,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	0.00
3. Agriculture	1,342.78	1,342.78	1,344.03	1,246.08	831.91	1,227.41	1,221.79	1,274.29	566.44	1,002.28	1,125.51	765.60	571.56	749.29	1,487.14	1,623.50	1,611.76	1,588.27	1,605.17	1,574.60	1,506.28	1,447.61	1,567.19	1,365.01	1,151.21	1,505.43	1,271.05	1,293.83	1,283.09	-4.45
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	1,012.43	1,012.43	1,007.13	1,006.04	629.49	1,012.88	1,070.22	1,136.22	454.49	857.60	976.01	629.90	430.95	560.78	1,330.99	1,392.21	1,405.34	1,393.45	1,352.33	1,390.00	1,234.56	1,175.09	1,257.35	1,081.90	928.96	1,184.96	915.80	926.26	936.67	-7.48
H. Urea application	327.60	327.60	334.16	237.33	199.72	211.85	148.92	135.41	109.26	141.99	146.82	133.02	138.00	185.89	153.53	228.63	203.76	192.27	250.34	181.94	269.11	269.90	307.24	280.73	219.89	318.07	352.79	365.10	343.95	4.99
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	NO	NO	NO	NO	0.00
J. Other	2.75	2.75	2.74	2.72	2.70	2.68	2.65	2.66	2.70	2.69	2.68	2.67	2.61	2.61	2.62	2.66	2.66	2.56	2.50	2.66	2.60	2.62	2.60	2.37	2.37	2.39	2.46	2.46	2.46	-10.43
4. Land Use, Land-Use Change and Forestry	-2,012.20	-2,012.20	-2,563.63	-3,327.77	-3,749.01	-3,888.02	-3,932.92	-4,755.97	-5,343.48	-6,030.20	-5,606.94	-5,991.55	-6,666.65	-7,538.44	-7,861.84	-8,552.21	-8,953.22	-9,452.88	-10,033.69	-10,471.30	-10,426.80	-10,714.51	-11,156.97	-10,610.84	-10,863.78	-11,075.79	-11,177.87	-11,266.19	-11,329.82	463.06
A. Forest land	-15,026.26	-15,026.26	-15,683.62	-16,247.69	-16,533.52	-16,502.08	-16,560.22	-17,064.11	-17,200.78	-17,731.12	-17,917.83	-18,219.49	-18,548.46	-18,826.16	-18,913.83	-18,884.13	-19,025.57	-19,247.45	-19,146.93	-19,675.41	-19,730.30	-19,497.40	-19,128.04	-16,869.93	-18,029.58	-18,207.34	-18,190.32	-18,350.13	-18,211.77	21.20
B. Cropland	14,265.93	14,265.93	14,229.99	14,141.30	14,314.93	14,319.25	14,607.22	14,514.33	14,501.28	14,536.59	14,641.00	14,456.73	14,136.24	13,842.24	13,495.22	13,261.68	12,906.49	12,739.44	12,360.62	12,288.94	12,287.96	12,031.10	11,845.05	11,710.29	11,502.82	11,269.79	11,200.61	11,059.73	10,971.23	-23.09
C. Grassland	-7,111.03	-7,111.03	-7,233.27	-7,350.12	-7,464.41	-7,576.21	-7,685.62	-7,792.79	-7,883.80	-8,001.73	-7,388.43	-6,910.25	-6,931.80	-7,098.93	-7,101.62	-7,410.87	-7,436.49	-7,651.44	-7,625.48	-7,762.80	-7,847.94	-7,929.09	-8,190.95	-8,300.86	-8,462.88	-8,433.86	-8,670.11	-8,654.53	-8,861.80	24.62
D. Wetlands	486.95	486.95	489.16	477.07	464.25	576.23	656.46	556.33	487.62	361.26	490.75	480.33	519.67	321.33	558.08	387.49	443.85	463.85	299.71	256.60	294.59	320.58	277.06	218.27	378.76	268.72	319.91	312.66	336.78	-30.84
E. Settlements	7,011.30	7,011.30	6,940.37	6,873.35	6,821.85	6,768.10	6,712.43	6,678.54	6,651.28	6,613.16	6,610.77	6,479.80	6,446.51	6,446.31	6,485.62	6,542.60	6,502.96	6,341.88	6,371.75	6,358.16	6,349.54	6,444.03	6,415.10	6,382.89	6,367.59	6,313.09	6,337.51	6,532.50	6,451.34	-7.99
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	NO	NO	NO	NO	0.00

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															%
G. Harvested wood products	-1,639.08	-1,639.08	-1,306.26	-1,221.68	-1,352.11	-1,473.31	-1,663.19	-1,648.27	-1,899.08	-1,808.35	-2,043.21	-2,278.68	-2,288.80	-2,223.23	-2,385.32	-2,448.99	-2,344.46	-2,099.15	-2,293.38	-1,936.79	-1,780.65	-2,083.73	-2,375.18	-3,751.49	-2,620.48	-2,286.20	-2,175.46	-2,166.42	-2,015.60	22.97
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	NO	NO	NO	NO	0.00
5. Waste	1,300.71	1,300.71	1,283.85	1,284.81	1,228.67	1,021.94	981.69	989.96	588.11	592.95	539.77	532.13	545.11	524.53	501.86	461.16	402.23	284.02	348.88	300.38	276.74	271.02	266.47	264.83	261.48	266.18	248.74	267.20	258.91	-80.09
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	NO,NE	NO,NE	NO,NE	NO,NE	0.00
B. Biological treatment of solid waste																														
C. Incineration and open burning of waste	1,300.71	1,300.71	1,283.85	1,284.81	1,228.67	1,021.94	981.69	989.96	588.11	592.95	539.77	532.13	545.11	524.53	501.86	461.16	402.23	284.02	348.88	300.38	276.74	271.02	266.47	264.83	261.48	266.18	248.74	267.20	258.91	-80.09
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	NO	NO	NO	NO	0.00
6. Other (as specified in the summary table in CRF)	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	NO	NO	NO	NO	0.00
Memo items:																														
International bunkers	24,279.10	24,279.10	23,998.83	25,827.59	26,762.39	26,923.62	28,638.21	30,716.66	32,965.16	36,120.03	36,064.47	38,106.32	37,961.86	36,512.14	36,920.21	40,872.25	43,528.29	44,963.06	44,931.53	47,653.94	45,642.63	42,991.83	45,299.02	43,006.45	43,296.11	44,103.42	43,776.95	44,689.25	45,165.66	86.03
Aviation	15,396.48	15,396.48	15,158.55	16,777.33	17,964.68	18,767.68	19,969.59	21,116.06	22,455.69	24,995.53	27,152.83	29,958.65	29,171.57	28,632.29	29,316.38	32,140.57	34,698.54	35,229.10	35,063.09	34,287.07	32,489.27	31,426.37	32,901.72	32,042.06	32,331.03	32,570.26	33,118.80	33,409.14	34,614.12	124.82
Navigation	8,882.62	8,882.62	8,840.28	9,050.26	8,797.71	8,155.94	8,668.63	9,600.60	10,509.47	11,124.50	8,911.64	8,147.67	8,790.29	7,879.85	7,603.83	8,731.68	8,829.74	9,733.96	9,868.44	13,366.87	13,153.36	11,565.45	12,397.30	10,964.39	10,965.08	11,533.16	10,658.15	11,280.11	10,551.54	18.79
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	NE	NE	NE	NE	0.00
CO_2 emissions from biomass	2,989.71	2,989.71	3,162.57	3,347.33	3,707.22	5,250.23	5,725.56	6,276.42	6,278.98	6,209.02	6,597.23	6,657.84	7,369.87	7,811.96	9,045.85	10,229.95	11,759.91	12,254.32	12,570.79	15,373.46	16,711.65	19,595.70	19,815.07	21,057.52	25,562.74	29,759.65	34,930.82	37,172.61	39,172.67	1,210.25
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	NO	NO	NO	0.00
Long-term storage of C in waste disposal sites	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	NE	NE	NE	NE	0.00
Indirect N_2O																														
Indirect CO_2 (3)	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	NO,NE	NO,NE	NO,NE	NO,NE	0.00
Total CO_2 equivalent emissions without land use, land-use change and forestry	601,480.56	601,480.56	609,307.74	593,748.10	579,700.11	575,832.96	567,353.52	589,063.32	562,980.06	568,148.01	561,198.18	567,901.86	576,720.67	560,803.39	572,282.26	573,786.44	570,496.68	568,098.12	559,915.61	545,411.80	494,890.21	512,672.50	470,413.81	488,341.12	478,459.35	439,580.09	423,122.05	400,554.10	388,101.10	-35.48
Total CO_2 equivalent emissions with land use, land-use change and forestry	599,468.36	599,468.36	606,744.11	590,420.33	575,951.10	571,944.94	563,420.61	584,307.35	557,636.58	562,117.81	555,591.24	561,910.30	570,054.02	553,264.94	564,420.42	565,234.23	561,543.46	558,645.24	549,881.92	534,940.50	484,463.41	501,957.99	459,256.84	477,730.28	467,595.57	428,504.30	411,944.19	389,287.91	376,771.27	-37.15
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	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	NA	NA	NA	NA	0.00
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	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	NA	NA	NA	NA	0.00

Note: All footnotes for this table are given at the end of the table on sheet 6.

Table 1(b)
Emissions trends CH_4

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															%
1. Energy	1,492.98	1,492.98	1,513.42	1,493.51	1,414.52	1,114.64	1,147.84	1,086.02	1,009.19	909.16	800.98	727.13	674.77	644.46	578.62	564.51	492.86	457.84	438.52	422.78	416.75	410.34	392.27	391.26	348.99	332.48	315.63	279.32	280.14	-81.24
A. Fuel combustion (sectoral approach)	126.11	126.11	131.51	123.52	126.23	114.88	98.97	101.19	92.78	89.04	88.56	80.18	78.28	71.07	66.43	63.98	59.31	55.49	54.63	56.46	53.75	58.77	52.59	55.30	58.32	55.40	59.97	62.10	63.22	-49.87

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															%
1. Energy industries	8.16	8.16	8.25	8.40	8.64	9.87	10.08	10.63	10.43	11.04	11.84	11.45	12.49	13.39	12.98	13.31	13.47	11.71	12.01	12.14	12.36	12.56	11.46	10.96	10.74	11.27	13.18	13.93	15.24	86.81
2. Manufacturing industries and construction	4.67	4.67	4.79	4.80	4.45	4.70	4.52	4.20	4.10	3.86	3.81	3.61	3.55	3.47	3.60	3.78	3.55	3.54	3.54	3.47	3.28	3.69	3.69	3.54	3.72	4.20	4.35	4.52	4.96	6.29
3. Transport	50.38	50.38	49.68	48.75	45.90	41.64	37.58	35.76	33.00	29.99	27.76	25.17	22.17	19.99	17.67	15.93	14.68	13.32	12.10	10.89	8.05	7.15	6.47	5.82	5.21	4.96	4.72	4.46	4.17	-91.73
4. Other sectors	62.76	62.76	68.68	61.47	67.13	58.56	46.69	50.50	45.16	44.07	45.06	39.88	39.99	34.14	32.10	30.88	27.54	26.81	26.87	29.87	29.98	35.29	30.89	34.91	38.59	34.92	37.68	39.15	38.81	-38.16
5. Other	0.14	0.14	0.11	0.10	0.11	0.11	0.10	0.10	0.09	0.09	0.08	0.07	0.08	0.08	0.08	0.08	0.07	0.09	0.10	0.09	0.08	0.08	0.07	0.07	0.06	0.05	0.04	0.04	0.04	-71.06
B. Fugitive emissions from fuels	1,366.88	1,366.88	1,381.91	1,369.99	1,288.28	999.76	1,048.87	984.83	916.41	820.13	712.42	646.95	596.50	573.39	512.19	500.53	433.55	402.35	383.89	366.32	363.00	351.57	339.68	335.96	290.67	277.08	255.65	217.22	216.92	-84.13
1. Solid fuels	873.07	873.07	897.83	890.36	829.10	550.96	602.52	557.61	534.51	455.34	377.12	324.44	288.14	283.20	233.32	209.56	154.76	139.90	113.44	113.70	109.95	102.27	97.98	98.67	68.18	67.28	55.38	20.26	19.51	-97.77
2. Oil and natural gas and other emissions from energy production	493.80	493.80	484.08	479.63	459.18	448.81	446.35	427.21	381.90	364.79	335.31	322.51	308.36	290.19	278.87	290.97	278.79	262.45	270.45	252.62	253.05	249.29	241.70	237.29	222.49	209.80	200.27	196.96	197.41	-60.02
C. CO_2 transport and storage																														
2. Industrial processes	10.92	10.92	10.56	11.13	9.94	11.45	9.37	10.44	9.04	7.10	6.18	5.72	5.57	5.72	6.48	5.97	5.16	5.22	5.57	4.30	4.65	4.83	4.34	4.73	5.02	4.89	3.18	3.55	3.12	-71.42
A. Mineral industry																														
B. Chemical industry	8.20	8.20	8.17	8.77	7.73	9.09	6.98	8.14	6.75	4.90	4.13	3.86	3.77	4.00	4.66	4.17	3.59	3.28	3.63	2.88	3.62	4.00	3.53	3.93	4.11	3.85	2.27	2.87	2.46	-70.03
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	0.56	0.57	0.65	0.73	0.84	0.70	0.45	0.43	-71.05
D. Non-energy products from fuels and solvent use	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	NO,IE	0.00
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	NO	NO	NO	NO	0.00
H. Other	1.24	1.24	1.01	0.90	0.76	0.86	0.85	0.77	0.73	0.71	0.58	0.59	0.58	0.59	0.62	0.61	0.51	0.83	0.88	0.43	0.27	0.27	0.25	0.16	0.18	0.20	0.20	0.24	0.24	-81.06
3. Agriculture	1,223.53	1,223.53	1,209.49	1,209.02	1,202.16	1,205.92	1,194.15	1,209.02	1,199.53	1,202.38	1,196.03	1,156.82	1,096.69	1,077.30	1,084.14	1,093.83	1,081.23	1,063.22	1,053.27	1,022.06	1,010.29	1,015.56	1,010.77	1,007.45	1,008.51	1,027.79	1,032.03	1,031.73	1,035.66	-15.36
A. Enteric fermentation	1,015.70	1,015.70	1,003.62	1,004.91	1,002.05	1,003.91	994.70	1,006.34	996.14	999.04	996.62	966.45	913.82	897.40	906.50	913.68	905.73	887.95	878.35	851.00	840.47	844.77	840.36	837.75	836.16	851.88	855.98	855.44	858.34	-15.49
B. Manure management	189.30	189.30	188.23	188.24	189.14	191.08	188.54	192.10	192.60	192.31	188.25	179.55	172.40	169.72	169.11	171.64	166.95	165.75	165.27	161.64	160.80	162.18	161.90	161.34	164.01	167.45	167.76	168.02	169.07	-10.69
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	NO	NO	NO	NO	0.00
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	NE	NE	NE	NE	0.00
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	NO	NO	NO	NO	0.00
F. Field burning of agricultural residues	7.46	7.46	6.56	4.80	0.16	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. Liming																														
H. Urea application																														
I. Other carbon-containing fertilizers																														
J. Other	11.07	11.07	11.08	11.06	10.81	10.93	10.91	10.59	10.79	11.03	11.16	10.82	10.48	10.19	8.53	8.51	8.56	9.52	9.66	9.42	9.02	8.61	8.52	8.36	8.34	8.45	8.29	8.27	8.25	-25.49
4. Land use, land-use change and forestry	0.64	0.64	0.72	0.57	0.61	0.60	1.10	0.84	0.98	0.78	0.63	1.17	1.13	1.15	2.24	1.18	1.45	1.24	1.65	1.22	1.37	1.40	1.34	2.36	1.00	1.24	0.80	1.34	1.13	77.88
A. Forest land	0.12	0.12	0.20	0.05	0.09	0.07	0.59	0.31	0.41	0.23	0.04	0.13	0.18	0.16	0.13	0.18	0.33	0.33	0.29	0.27	0.24	0.12	0.16	0.74	0.19	0.20	NO,NE, IE,NA	0.02	0.09	-19.96
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	0.00	0.00	0.00	NO, NE, IE, NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-74.10
C. Grassland	0.40	0.40	0.40	0.40	0.40	0.41	0.41	0.41	0.43	0.41	0.41	0.99	0.91	0.92	1.97	0.78	0.91	0.87	1.27	0.86	1.03	1.06	0.97	1.43	0.63	0.90	0.61	0.91	0.71	78.40
D. Wetlands	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	NO, NE,NA	0.00
E. Settlements	0.12	0.12	0.11	0.11	0.11	0.11	0.10	0.12	0.13	0.14	0.17	0.05	0.04	0.07	0.13	0.22	0.20	0.04	0.09	0.09	0.10	0.22	0.21	0.19	0.19	0.14	0.18	0.41	0.33	175.14
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	NO	NO	NO	NO	0.00
G. Harvested wood products																														
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	NO	NO	NO	NO	0.00
5. Waste	2,592.19	2,592.19	2,616.47	2,622.70	2,644.06	2,663.62	2,704.41	2,715.19	2,709.94	2,668.77	2,561.73	2,466.35	2,384.72	2,336.15	2,186.35	2,018.99	1,915.16	1,792.52	1,666.45	1,491.01	1,327.28	1,141.19	1,056.90	995.48	872.83	782.26	772.71	745.70	756.45	-70.82
A. Solid waste disposal	2,417.32	2,417.32	2,441.53	2,444.85	2,466.19	2,487.66	2,532.43	2,540.41	2,532.73	2,492.76	2,382.37	2,283.36	2,234.78	2,187.74	2,040.48	1,865.26	1,757.58	1,630.82	1,498.82	1,325.38	1,168.59	979.83	889.53	830.74	706.75	609.60	593.44	565.18	570.46	-76.40

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															*%*
B. Biological treatment of solid waste	0.73	0.73	0.81	0.86	0.92	0.99	1.30	1.62	2.00	3.45	4.08	4.89	7.70	8.37	8.85	11.87	15.44	18.41	21.84	21.76	25.46	29.62	35.02	34.50	36.91	39.72	42.35	45.43	47.74	6482.88
C. Incineration and open burning of waste	5.39	5.39	5.25	5.00	4.42	3.34	3.19	3.24	1.03	1.01	1.10	1.01	1.03	1.03	1.11	0.93	0.88	0.88	0.83	0.77	0.67	0.51	0.51	0.49	0.45	0.42	0.43	0.42	0.42	-92.25
D. Waste water treatment and discharge	168.76	168.76	168.88	171.99	172.53	171.62	167.50	169.93	174.18	171.55	174.18	177.09	141.21	139.02	135.92	140.93	141.26	142.41	144.96	143.09	132.55	131.23	131.83	129.75	128.72	132.51	136.50	134.67	137.83	-18.33
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	NO	NO	NO	NO	0.00
6. Other (as specified in the summary table in CRF)	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	NO	NO	NO	NO	0.00
Total CH_4 emissions without CH_4 from LULUCF	5,319.63	5,319.63	5,349.94	5,336.36	5,270.69	4,995.62	5,055.78	5,020.67	4,927.71	4,787.41	4,564.92	4,356.02	4,161.76	4,063.64	3,855.58	3,683.29	3,494.41	3,318.80	3,163.81	2,940.14	2,758.97	2,571.91	2,464.27	2,398.92	2,235.35	2,147.43	2,123.55	2,060.31	2,075.37	-60.99
Total CH_4 emissions with CH_4 from LULUCF	5,320.26	5,320.26	5,350.66	5,336.93	5,271.30	4,996.22	5,056.88	5,021.51	4,928.68	4,788.20	4,565.55	4,357.19	4,162.90	4,064.79	3,857.82	3,684.47	3,495.85	3,320.04	3,165.46	2,941.37	2,760.34	2,573.31	2,465.61	2,401.28	2,236.35	2,148.67	2,124.34	2,061.64	2,076.50	-60.97
Memo items:																														
International bunkers	0.47	0.47	0.41	0.39	0.37	0.34	0.35	0.36	0.39	0.39	0.33	0.30	0.27	0.25	0.25	0.26	0.27	0.29	0.29	0.34	0.32	0.29	0.31	0.27	0.27	0.27	0.26	0.26	0.25	-46.71
Aviation	0.34	0.34	0.28	0.25	0.24	0.22	0.22	0.22	0.22	0.23	0.20	0.18	0.15	0.14	0.13	0.13	0.13	0.14	0.13	0.12	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	-69.86
Navigation	0.13	0.13	0.13	0.13	0.13	0.12	0.13	0.14	0.16	0.17	0.13	0.12	0.12	0.11	0.12	0.13	0.14	0.15	0.16	0.22	0.21	0.19	0.20	0.17	0.17	0.17	0.15	0.16	0.15	12.41
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	NE	NE	NE	NE	0.00
CO_2 emissions from biomass																														
CO_2 captured																														
Long-term storage of C in waste disposal sites																														
Indirect N_2O																														
Indirect CO_2 (3)																														

Note: All footnotes for this table are given at the end of the table on sheet 6.

Table 1(c)
Emissions trends N_2O

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															*%*
1. Energy	12.19	12.19	12.18	11.99	11.96	12.51	13.01	12.47	11.94	11.86	11.42	11.39	11.26	11.03	10.64	10.30	10.15	9.99	9.51	8.66	8.03	8.19	8.21	8.90	8.76	8.66	8.79	8.36	8.43	-30.83
A. Fuel combustion (sectoral approach)	12.06	12.06	12.04	11.85	11.80	12.34	12.82	12.27	11.76	11.69	11.25	11.24	11.11	10.89	10.52	10.17	10.00	9.87	9.38	8.55	7.92	8.09	8.07	8.77	8.65	8.54	8.67	8.24	8.30	-31.14
1. Energy industries	4.60	4.60	4.61	4.44	3.98	4.06	4.03	3.95	3.65	3.81	3.47	3.74	4.00	4.11	4.09	3.94	4.04	4.12	3.75	3.55	3.23	3.25	3.30	3.85	3.64	3.36	3.25	2.60	2.52	-45.16
2. Manufacturing industries and construction	1.08	1.08	1.07	1.06	1.03	1.06	1.01	0.98	0.96	0.92	0.89	0.85	0.85	0.83	0.84	0.88	0.84	0.85	0.84	0.79	0.69	0.73	0.70	0.71	0.65	0.72	0.76	0.78	0.84	-22.42
3. Transport	4.87	4.87	4.80	4.90	5.27	5.84	6.58	6.08	5.99	5.84	5.78	5.63	5.24	5.02	4.69	4.48	4.30	4.08	3.97	3.37	3.17	3.20	3.26	3.34	3.45	3.62	3.80	3.98	4.06	-16.57
4. Other sectors	1.32	1.32	1.41	1.30	1.38	1.24	1.06	1.12	1.04	1.01	1.01	0.92	0.92	0.82	0.78	0.76	0.71	0.69	0.68	0.72	0.71	0.80	0.72	0.78	0.83	0.77	0.81	0.83	0.82	-37.58
5. Other	0.19	0.19	0.16	0.15	0.15	0.14	0.14	0.14	0.13	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.12	0.13	0.12	0.11	0.10	0.10	0.09	0.08	0.07	0.06	0.05	0.06	-70.64
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	0.11	0.12	0.12	0.13	-3.60
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	0.00	0.00	0.00	0.00	-80.62
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	0.11	0.12	0.12	0.13	-3.42
C. CO_2 transport and storage																														

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															*%*
2. Industrial processes	81.91	81.91	82.47	67.86	55.15	55.08	50.01	49.67	50.27	51.19	19.31	19.94	17.60	12.24	11.46	14.53	12.29	10.42	11.87	11.24	6.58	7.00	3.89	3.07	2.90	2.97	2.85	2.88	2.98	-96.36
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	10.17	9.39	12.09	9.51	7.64	8.89	8.10	3.86	4.25	0.67	0.14	0.15	0.14	0.10	0.09	0.13	-99.84
C. Metal industry	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.02	0.02	-65.11
D. Non-energy products from fuels and solvent use	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	NO,NE,IE	0.00
E. Electronic industry																														
F. Product uses as ODS substitutes																														
G. Other product manufacture and use	1.99	1.99	2.00	1.99	1.99	1.99	1.99	1.94	1.94	1.96	1.96	2.00	2.02	2.02	2.02	2.39	2.73	2.74	2.93	3.11	2.69	2.71	3.18	2.90	2.71	2.80	2.71	2.77	2.83	42.17
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	NO	NO	NO	NO	0.00
3. Agriculture	57.86	57.86	58.04	56.21	54.73	56.31	56.64	57.35	58.13	57.10	57.46	54.50	51.92	52.02	51.82	50.91	50.18	48.37	47.43	46.85	46.99	47.24	47.54	47.24	47.19	48.97	47.32	47.33	48.24	-16.63
A. Enteric fermentation																														
B. Manuremanagement	11.55	11.55	11.51	11.47	11.49	11.55	11.54	11.87	11.99	11.85	11.54	11.18	10.75	10.40	10.43	10.60	10.38	10.22	9.93	9.65	9.56	9.55	9.43	9.36	9.43	9.43	9.40	9.47	9.45	-18.24
C. Rice cultivation																														
D. Agricultural soils	45.67	45.67	45.92	44.18	42.80	44.33	44.67	45.07	45.71	44.82	45.48	42.91	40.77	41.24	41.05	39.96	39.45	37.81	37.15	36.86	37.10	37.37	37.80	37.57	37.45	39.23	37.61	37.56	38.48	-15.75
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	NO	NO	NO	NO	0.00
F. Field burning of agricultural residues	0.19	0.19	0.17	0.12	0.00	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. Liming																														
H. Urea application																														
I. Other carbon containing fertlizers																														
J. Other	0.44	0.44	0.44	0.43	0.43	0.44	0.43	0.42	0.43	0.43	0.43	0.41	0.40	0.38	0.35	0.35	0.35	0.35	0.35	0.34	0.33	0.31	0.32	0.31	0.31	0.31	0.31	0.31	0.31	-29.53
4. Land use, land-use change and forestry	7.56	7.56	7.51	7.44	7.41	7.37	7.36	7.31	7.28	7.24	7.21	7.01	6.78	6.59	6.49	6.21	6.05	5.87	5.73	5.52	5.37	5.27	5.20	5.20	5.02	4.97	4.85	4.81	4.73	-37.44
A. Forest land	0.78	0.78	0.77	0.74	0.74	0.73	0.75	0.72	0.72	0.70	0.68	0.68	0.69	0.68	0.68	0.67	0.67	0.66	0.64	0.61	0.58	0.55	0.56	0.59	0.55	0.54	0.51	0.50	0.49	-37.44
B. Cropland	3.42	3.42	3.41	3.40	3.40	3.39	3.38	3.38	3.37	3.37	3.36	3.18	3.01	2.85	2.70	2.56	2.43	2.30	2.18	2.07	1.96	1.90	1.84	1.79	1.73	1.68	1.64	1.59	1.55	-54.70
C. Grassland	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.07	0.07	0.08	0.17	0.08	0.09	0.09	0.13	0.09	0.11	0.12	0.12	0.16	0.09	0.12	0.10	0.12	0.11	221.68
D. Wetlands	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-92.85
E. Settlements	1.96	1.96	1.94	1.93	1.91	1.89	1.88	1.87	1.86	1.85	1.84	1.82	1.82	1.81	1.81	1.81	1.80	1.79	1.79	1.78	1.78	1.78	1.78	1.77	1.77	1.76	1.76	1.77	1.76	-10.21
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	NO	NO	NO	NO	0.00
G. Harvested wood products																														
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	NO	NO	NO	NO	0.00
5. Waste	2.83	2.83	2.81	2.92	2.89	2.89	2.92	3.04	3.04	3.12	3.10	3.28	3.32	3.35	3.26	3.39	3.61	3.75	3.92	3.83	4.10	4.39	4.67	4.54	4.61	4.69	4.76	4.89	5.01	77.13
A. Solid waste disposal																														
B. Biological treatment of solid waste	0.04	0.04	0.05	0.05	0.06	0.06	0.08	0.10	0.12	0.21	0.24	0.29	0.46	0.50	0.53	0.71	0.92	1.09	1.30	1.29	1.49	1.74	2.03	1.94	2.05	2.14	2.23	2.33	2.44	5514.00
C. Incineration and open burning of waste	0.16	0.16	0.15	0.15	0.15	0.13	0.13	0.14	0.10	0.19	0.19	0.19	0.20	0.20	0.20	0.20	0.20	0.20	0.19	0.17	0.18	0.20	0.20	0.19	0.18	0.16	0.16	0.14	0.13	-15.08
D. Waste water treatmentanddischarge	2.63	2.63	2.61	2.72	2.68	2.70	2.71	2.81	2.82	2.73	2.67	2.79	2.67	2.65	2.54	2.49	2.50	2.46	2.43	2.36	2.43	2.45	2.44	2.41	2.38	2.38	2.38	2.41	2.44	-7.36
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	NO	NO	NO	NO	0.00
6. Other (as specified in the summary table in CRF)	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	NO	NO	NO	NO	0.00
Total direct N_2O emissions without N_2O from LULUCF	154.79	154.79	155.50	138.98	124.73	126.80	122.59	122.54	123.37	123.27	91.29	89.11	84.12	78.64	77.19	79.14	76.23	72.53	72.73	70.58	65.71	66.82	64.32	63.76	63.46	65.29	63.72	63.46	64.67	-58.22
Total direct N_2O emissions with N_2O from LULUCF	162.35	162.35	163.01	146.42	132.14	134.16	129.95	129.84	130.65	130.51	98.49	96.11	90.90	85.22	83.68	85.35	82.28	78.40	78.47	76.11	71.08	72.09	69.51	68.95	68.48	70.25	68.57	68.28	69.39	-57.26
Memo items:																														

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															*%*
International bunkers	0.91	0.91	0.90	0.96	0.99	0.98	1.04	1.12	1.21	1.32	1.28	1.34	1.34	1.28	1.29	1.43	1.52	1.58	1.58	1.72	1.66	1.55	1.63	1.54	1.54	1.58	1.55	1.58	1.59	74.71
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	1.11	1.09	1.03	1.00	1.04	1.02	1.03	1.03	1.05	1.06	1.10	124.84
Navigation	0.42	0.42	0.42	0.43	0.42	0.38	0.41	0.45	0.50	0.53	0.42	0.38	0.41	0.37	0.36	0.41	0.42	0.46	0.47	0.63	0.62	0.55	0.59	0.52	0.52	0.54	0.49	0.52	0.49	16.35
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	NE	NE	NE	NE	0.00
CO_2 emissions from biomass																														
CO_2 captured																														
Long-term storage of C in waste disposal sites																														
Indirect N_2O	14.94	14.94	14.49	14.21	13.43	12.96	12.39	11.92	11.02	10.84	10.25	9.97	9.80	9.30	9.13	8.90	8.84	8.52	8.18	7.40	6.52	6.38	5.97	6.05	5.75	5.38	5.20	4.72	0.36	-97.60
Indirect CO_2 (3)																														

Note: All footnotes for this table are given at the end of the table on sheet 6.

Table 1(d)
Emissions trends HFCs, PFCs and SF_6

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															*%*
Emissions of HFCs and PFCs – (kt CO_2 equivalent)	16,042.95	16,042.95	16,376.19	16,287.99	17,108.43	18,204.85	19,693.07	20,845.79	23,607.87	20,568.40	11,939.96	10,480.99	11,379.19	11,799.85	13,186.29	12,343.59	13,517.51	14,434.67	14,784.69	15,258.26	15,819.79	16,774.22	15,351.21	15,736.15	16,126.74	16,280.72	16,315.00	15,570.00	14,564.29	-9.22
Emissions of HFCs – (kt CO_2 equivalent)	14,391.43	14,391.43	14,991.05	15,597.64	16,505.70	17,593.46	19,096.14	20,249.43	23,104.75	20,074.67	11,466.00	9,884.20	10,893.60	11,391.62	12,829.68	11,909.73	13,132.36	14,047.00	14,496.86	14,992.01	15,622.46	16,486.51	14,934.26	15,481.09	15,808.01	16,002.40	15,987.77	15,216.05	14,192.82	-1.38
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	0.00	0.00	0.00	0.00	-99.84
HFC-32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.03	0.04	0.06	0.09	0.11	0.14	0.17	0.20	0.24	0.28	0.33	0.39	0.44	0.49	0.55	0.62	0.69	0.79	0.89	4878148.29
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	NO	NO	NO	NO	0.00
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	0.01	0.01	0.01	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	100.00
HFC-125	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.06	0.11	0.18	0.27	0.36	0.46	0.54	0.64	0.74	0.82	0.97	1.03	1.10	1.17	1.36	1.25	1.34	1.41	1.45	1.48	1.42	1.35	3902064.37
HFC-134	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	NO	NO	NO	NO	0.00
HFC-134a	0.00	0.00	0.00	0.01	0.21	0.51	0.83	1.15	1.71	2.29	2.22	2.55	2.89	3.04	3.51	3.71	4.17	4.33	4.39	4.56	4.72	4.76	4.62	4.70	4.72	4.76	4.79	4.77	4.67	591900.78
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	NO	NO	NO	NO	0.00
HFC-143a	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.07	0.12	0.19	0.27	0.36	0.44	0.51	0.58	0.66	0.71	0.77	0.83	0.86	0.89	0.92	0.68	0.69	0.70	0.68	0.62	0.48	0.32	632905.55
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	NO	NO	NO	NO	0.00
HFC-152a	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.07	0.08	0.10	0.11	0.19	0.19	0.18	0.18	0.20	0.20	0.18	0.12	0.12	0.24	0.25	0.27	0.29	0.31	0.33	0.35	41208402.77
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	NO	NO	NO	NO	0.00
HFC-227ea	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.07	0.10	0.11	0.10	0.11	0.11	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.14	0.15	0.15	100.00
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	NO	NO	NO	NO	0.00
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	NO	NO	NO	NO	0.00
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	NO	NO	NO	NO	0.00
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	NO	NO	NO	NO	0.00
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00	0.01	0.01	0.02	0.04	0.06	0.07	0.07	0.08	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.09	0.10	100.00
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00	0.01	0.02	0.04	0.07	0.11	0.13	0.14	0.15	0.16	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.12	0.13	0.13	100.00
Unspecified mix of HFCs(4) – (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	NO	NO	NO	NO	0.00
Emissions of PFCs – (kt CO_2 equivalent)	1,651.53	1,651.53	1,385.14	690.35	602.73	611.39	596.94	596.36	503.11	493.73	473.96	596.79	485.59	408.23	356.61	433.85	385.15	387.67	287.84	266.25	197.33	287.71	416.94	255.05	318.74	278.31	327.23	353.94	371.47	-77.51
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	0.01	0.01	0.01	0.01	-91.82
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	0.01	0.01	0.01	0.01	-63.20
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	0.02	0.01	0.01	0.02	0.02	5108.38

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*	*2014*	*2015*	*2016*	*2017*	*Change from base to latest reported year*
															kt															%
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	NO	NO	NO	NO	0.00
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	0.00	0.00	0.00	0.00	407.49
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	NO	NO	NO	NO	0.00
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	NO	NO	NO	NO	0.00
$C_{10}F_{18}$	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	NO	NO	NO	NO	0.00
c-C_3F_6	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	NO	NO	NO	NO	0.00
Unspecified mix of PFCs(4) – (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	2.38	3.95	2.08	3.58	3.80	3.84	-71.43
Unspecified mix of HFCs and PFCs – (kt CO_2 equivalent)	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	NO	NO	NO	NO	0.00
Emissions of SF_6 – (kt CO_2 equivalent)	1,305.31	1,305.31	1,346.64	1,388.22	1,214.71	1,257.12	1,299.96	1,343.14	1,316.14	1,363.09	1,530.12	1,847.78	1,481.62	1,519.52	1,343.38	1,137.47	1,074.26	897.88	852.32	696.10	605.74	702.79	622.21	602.84	522.05	500.32	465.21	490.59	525.41	-59.75
SF_6	0.06	0.06	0.06	0.06	0.05	0.06	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	0.02	0.02	0.02	0.02	0.02	-59.75
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	0.40	0.44	0.48	0.53	27.83
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	0.00	0.00	0.00	0.00	27.83

Note: All footnotes for this table are given at the end of the table on sheet 6.

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	The emissions reduction target refers to the EU-wide target under the Convention. The EU proposed a similar target under the Second commitment period of the Kyoto Protocol (KP), with different treatment of the LULUCF sectors and different geographical coverage for the UK.
Emission reductions target (% of 1990)	20%	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 (ESD) 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.
Period for reaching target	BY-2020	The ESD and ETS targets for the UK apply to the UK's geographical coverage for the EU (GBE), which differs from UK's geographical coverage under the Kyoto Protocol (GBK), which also differs from the UNFCCC geographical coverage (GBR).

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	In principle, the EU ETS should cover CO_2 emissions of all flights arriving at, and departing from, airports in all EU Member States, Norway, Iceland and Liechtenstein and closely related territories. However, since 2012, flights to and from aerodromes from other countries have not been included in the EU ETS. This exclusion was taken in order to facilitate negotiation of a global agreement to address aviation emissions in the forum of the International Civil Aviation Organisation (ICAO). The EU has decided on a reduced scope in the 2013–2016 period (Regulation (EU) No 421/2014 of the European Parliament and of the Council of 16 April 2014) In light of the adoption of a Resolution by the 2016 ICAO Assembly on the global measure, the EU has decided to maintain the geographic scope of the EU ETS limited to intra-EEA flights from 2017 onwards (Regulation (EU) 2017/2392 of the European Parliament and of the Council of 13 December 2017). In the absence of an amendment, the EU ETS will revert back to its original full scope from 2024.

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

Gases covered	Covered	GWPb 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		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	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)		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: other market-based mechanisms

Possible scale of contributions of market-based mechanisms	0

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.

Under the second commitment period of the Kyoto Protocol (2013 – 2020) the EU has a collective target to reduce its emissions by 20% relative to base year (1990) 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. The Doha Amendment of the Kyoto Protocol has not entered into force and Assigned Amount Units (AAUs) not distributed, however the expected AAUs for the UK have been calculated as indicated in this report. The calculation of the UK's Assigned Amount is set out in UK's Initial Report for the second commitment period, and results in an Assigned Amount of 2,744,937,332 assigned amount units (AAUs) over the commitment period, where one AAU is equivalent to one tCO_2eq.

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

Name of mitigation action	*Included in with measures GHG projection scenario*	*Sector(s) affected*	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument*	*Status of implementation*	*Brief description*	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2020*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2025*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2030*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2035*
Building Regulations Part L (2002+2005/6)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption)	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	Ministry of Housing, Communities & Local Government (MHCLG)	10053	7710	5119	2736
Building Regulations 2010 Part L*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	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	Ministry of Housing, Communities & Local Government (MHCLG)	5088	6374	4885	3794
Building Regulations 2013 Part L*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption)	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	Ministry of Housing, Communities & Local Government (MHCLG)	76	100	98	85
Sustainable Energy-Using Products – Post-Low Carbon Transition Plan*	Yes	Energy	CO2	Efficiency improvement of appliances (Energy consumption)	Regulatory	Implemented	The EU Ecodesign Directive and the Energy Labelling Framework Regulation operate by setting minimum performance and information requirements (respectively) for energy-using products. They aim to take the least efficient products off the market and to give consumers clear energy use-related information to guide their purchasing decisions. This is implemented through product-specific EU regulations.	2010	Department for Business, Energy and Industrial Strategy (BEIS)	2033	1999	1473	921
Sustainable Energy-Using Products – Adopted*	Yes	Energy	CO2	Efficiency improvement of appliances (Energy consumption)	Regulatory	Implemented	The EU Ecodesign Directive and the Energy Labelling Framework Regulation operate by setting minimum performance and information requirements (respectively) for energy-using products. They aim to take the least efficient products off the market and to give consumers clear energy use-related information to guide their purchasing decisions. This is implemented through product-specific EU regulations.	2008	Department for Business, Energy and Industrial Strategy (BEIS)	69	132	139	70

Name of mitigation action	*Included in with measures GHG projection scenario*	*Sector(s) affected*	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument*	*Status of implementation*	*Brief description*	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2020*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2025*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2030*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2035*
Energy Performance of Buildings Directive (EPBD; UK transposition)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Regulatory	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	Ministry of Housing, Communities & Local Government (MHCLG)	510	441	387	337
Carbon Trust measures*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption), Efficiency improvement in services/ tertiary sector (Energy consumption), Efficiency improvement in industrial end-use sectors (Energy consumption), Demand management/ reduction (Energy consumption)	Information	Implemented	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.	2002	Companies acting on advice from Carbon Trust	317	66	0	0
Small and Medium Enterprises (SME) Loans*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption), Efficiency improvement in services/ tertiary sector (Energy consumption), Efficiency improvement in industrial end-use sectors (Energy consumption), Demand management/ reduction (Energy consumption)	Economic	Implemented	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	Administered by the Carbon Trust, Department for Business, Energy and Industrial Strategy (BEIS)	72	31	0	0

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Public Sector Energy Efficiency Loans Scheme – 2014-2015*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption), Efficiency improvement in services/ tertiary sector (Energy consumption), Demand management/ reduction (Energy consumption)	Economic	Implemented	Salix provides interest free loans in England to public sector organisations for energy efficiency schemes. These loans are intended to provide the capital cost of energy efficiency retrofit work and other measures to be installed. These loans then have a payback period of five years (eight for schools) during which the repayments are met with the energy bill savings from the energy efficiency measures. Thus, once the loan has been paid off, the organisations continue to benefit from energy savings for the lifetime of these measures. This funding is then recycled once it has been returned to Salix and once again loaned out. UK Department for Business, Energy and Industrial Strategy provides the most amount of funding to Salix.	2014	Department for Business, Energy and Industrial Strategy (BEIS), Local government (Local)	113	156	130	64
Warm front*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption)	Economic	Implemented	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	Carillion, Department for Business, Energy and Industrial Strategy (BEIS)	252	251	263	260
EEC1 (energy efficiency commitment), EEC2 (2002-2008) & Baseline Carbon Emissions Reduction Target (CERT) (2008-2010)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption)	Regulatory	Implemented	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 CO2 emitted by householders.	2002	Office of Gas and Electricity Markets (Ofgem), Large domestic energy suppliers, Department for Business, Energy and Industrial Strategy (BEIS)	2813	2478	2300	2262

Name of mitigation action	*Included in with measures GHG projection scenario*	*Sector(s) affected*	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument*	*Status of implementation*	*Brief description*	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2020*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2025*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2030*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2035*
Carbon Emissions Reduction Target (CERT) Uplift and Extension (2010-12)*		Energy consumption (comprising consumption of fuels and electricity by end users such as households, services, industry and agriculture)	Carbon dioxide (CO_2)	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption)	Regulatory	Expired (only if the policy or measure has an effect, or is expected to continue to have an effect on greenhouse gas emissions)	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	Office of Gas and Electricity Markets (Ofgem), Larger Energy Suppliers, Department for Business, Energy and Industrial Strategy (BEIS)	1,616	1,421	1,324	1,248
Community Energy Saving Programme (CESP)*		Energy consumption (comprising consumption of fuels and electricity by end users such as households, services, industry and agriculture)	Carbon dioxide (CO_2)	Efficiency improvements of buildings (Energy consumption), Efficiency improvement of appliances (Energy consumption)	Regulatory	Expired (only if the policy or measure has an effect, or is expected to continue to have an effect on greenhouse gas emissions)	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	Office of Gas and Electricity Markets (Ofgem), Larger Energy Suppliers, Department for Business, Energy and Industrial Strategy (BEIS)	94	72	64	55
Energy company obligation (ECO)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	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 ran until March 2017.	2013	Large Energy Suppliers, Department for Business, Energy and Industrial Strategy (BEIS)	645	623	599	579
Smart Metering*	Yes	Energy	CO2	Demand management/ reduction (Energy consumption)	Information, Regulatory	Implemented	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, so avoiding 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 by the system.	2014	Department for Business, Energy and Industrial Strategy (BEIS)	1,484	1,712	1,633	1,548

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Renewable heat incentive (RHI)*	Yes	Energy	CO2	Increase in renewable energy; switch to less carbon-intensive fuels	Economic	Implemented	The Non-Domestic Renewable Heat Incentive (RHI) provides financial incentives to increase the uptake of renewable heat by businesses, the public sector and non-profit organisations. Eligible installations receive quarterly payments for 20 years based on the amount of heat generated. The Domestic RHI is a government financial incentive to promote the use of residential renewable heat. Eligible installations receive quarterly payments for seven years for the estimated amount of renewable heat their system produces.	2011	Department for Business, Energy and Industrial Strategy (BEIS)	4,078	4,469	4,469	3,122
CRC (carbon reduction commitment) Energy Efficiency Scheme*	Yes	Energy	CO2	Efficiency improvement in services/ tertiary sector (Energy consumption)	Economic, Regulatory	Implemented	The CRC (formerly the Carbon Reduction Commitment) 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 1,800-1,900 large users of energy across the business and public sector. The scheme is split into phases. Phase 1 ran from 1 April 2010 until 31 March 2014. Phase 2 runs from 1 April 2014 until 31 March 2019. In the 2016 Spring Budget, the Chancellor announced the closure of the CRC after Phase 2 (i.e. following the 2018/19 compliance year).	2010	Department for Business, Energy and Industrial Strategy (BEIS), Environment Agency (EA)	936	915	0	0
Climate Change Agreements (CCA)*	Yes	Energy	CO2	Efficiency improvement in industrial end-use sectors (Energy consumption)	Economic, Regulatory	Implemented	Climate Change Agreements offer participating energy-intensive industries a discount from the Climate Change Levy in return for meeting targets for emission reductions. From 2013 these are a 90% discount for electricity and a 65% discount for other fuels. From 2019 this will increase to a 93% discount for electricity and 78% discount for other fuels. Target levels represent a cap on emissions if we assume compliance.	2013	Industry Associations, Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

Name of mitigation action	*Included in with measures GHG projection scenario*	*Sector(s) affected*	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument*	*Status of implementation*	*Brief description*	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2020*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2025*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2030*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2035*
Energy Savings Opportunity Scheme (ESOS)*	Yes	Energy	CO2	Demand management/ reduction (Energy consumption)	Information, Regulatory	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 for Business, Energy and Industrial Strategy (BEIS). Environment Agency	670	581	531	477
Energy Performance of Buildings Directive (EPBD) Recast 2010*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Regulatory	Adopted	Extension of the Energy Performance of Buildings Directive (EPBD) requirement for public buildings to display Energy Performance Certificates to include buildings over 250 metres squared from 9 July 2015.	2015	Ministry of Housing, Communities & Local Government (MHCLG)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Private Rented Sector (PRS) Energy Efficiency Regulations*	Yes	Energy	CO2	Efficiency improvement in services/ tertiary sector (Energy consumption)	Information, Regulatory	Adopted	From 1 April 2018 there is 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 came 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.	2018	Department for Business, Energy and Industrial Strategy (BEIS)	382	430	305	197
ECO Transition/ Help to Heat/ Future Supplier Obligation	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Regulatory	Implemented	The 2015 Spending Review announced that ECO will be replaced with a new, lower cost scheme that will run for 5 years (to March 2022) and will tackle the root causes of fuel poverty. The 5-year extension will take place in the two phases, with the ECO Extension (April 2017 – Sept 2018) acting as a bridge between the expired ECO scheme and the new fuel poverty focused scheme, ECO 3, which will run from December 2018 to March 2022.	2017	Department for Business, Energy and Industrial Strategy (BEIS), Large Energy Suppliers	196	188	189	187

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Public Sector Energy Efficiency Loans Scheme – 2014-2020*	Yes	Energy	CO2	Efficiency improvement in services/ tertiary sector (Energy consumption)	Economic	Implemented	The Public Sector Energy Efficiency Loans Scheme, managed by Salix Finance Ltd, provides interest-free loans in England to public sector organisations for energy efficiency schemes. These loans are intended to provide the capital cost of energy efficiency retrofit work and other measures to be installed. These loans have a payback period of five years (eight for schools) during which the repayments are met with the energy bill savings from the energy efficiency measures. Thus, once the loan has been paid off, the organisation continues to benefit from energy savings for the lifetime of those measures. This funding is then recycled: once it has been returned to the Scheme and it is loaned out once again. BEIS provides the largest amount of funding to the Scheme.	2014	Department for Business, Energy and Industrial Strategy (BEIS), Local government	165	343	336	220
Agricultural Action Plan*	Yes	Agriculture	CH4, N2O	Reduction of fertilizer/manure use on cropland (Agriculture), Improved animal waste management systems (Agriculture), Improved livestock management (Agriculture), Activities improving grazing land or grassland management (Agriculture), Improved management of organic soils (Agriculture)	Voluntary Agreement	Implemented	The Agricultural Action Plan covers a range of resource-efficiency and land management measures to reduce emissions to meet UK carbon budgets.	2010	Department for Food, Environment and Rural Affairs (DEFRA), Industry Associations	2,603	3,507	3,841	3,974

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Car Fuel Efficiency Policies*	Yes	Transport	CO2	Efficiency improvements of vehicles (Transport)	Regulatory, Economic, Fiscal, Information	Implemented	EC Regulation 443/2009 sets fuel efficiency targets for new cars to be achieved by 2015 and 2020. The regulation translates a fleet average CO2 tailpipe emissions target for new vehicles sold in the EU market into specific targets for individual manufacturers according to the mass of their fleet. Heavy fines are imposed for non-compliance. The 2021 target is for a fleet average of 95g CO2/km across the EU, with a transition period where 95% of a manufacturer's fleet must meet the 95g target by 2020. Complementary measures are a collection of technologies that could improve 'real world' fuel efficiency of cars which wouldn't be fully captured by the new car CO2 target and which could improve fuel efficiency in 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 introduces labelling for the rolling resistance, wet grip and external rolling noise of tyres. Measures to support the uptake of ultra low emission vehicles include the Plug-in Car and Plug-in Van Grants towards ultra-low emission vehicle (ULEV) cars and vans, as well as various tax incentives including lower rates for Vehicle Excise Duty and Company Car Tax. EV infrastructure is directly supported through the Workplace Charging Scheme grants for EV chargepoints for employees and fleets, the Electric Vehicle Homecharge Scheme grants towards home EV chargepoints and the On-street Residential Charging Scheme. Highways England have committed £15m to ensure EV chargepoints are available every 20 miles on the Strategic Road Network.	2012	Department for Transport	4182	10128	15852	20588
Forestry policies	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF), Enhanced forest management (LULUCF), Sustainable forest management	Voluntary Agreement, Economic	Implemented	Range of policies aimed at driving afforestation and reforestation. Measures quantified in this group are indicated in this table with a label '[2]'.	Various	Forestry Commission, Department for Food, Environment and Rural Affairs (DEFRA)	-150	-94	-6	107

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Van Fuel Efficiency Policies*	Yes	Transport	CO2	Efficiency improvements of vehicles (Transport)	Economic, Fiscal, Information, Regulatory	Implemented	EC Regulation 510/2011 sets fuel efficiency targets for new Light Commercial Vehicles (LCV) to be achieved by 2017 and 2020. EC Regulation 661/2009 sets minimum requirements and introduces labelling for the rolling resistance, wet grip and external rolling noise of tyres. The regulation translates a fleet average CO2 tailpipe emissions target for new vehicles sold in the EU market into specific targets for individual manufacturers according to the mass of their fleet. Heavy fines are imposed for non-compliance. The 2020 target is for a fleet average of 147g CO2 /km and represents a reduction of 19% from the 2012 average. Measures include the car and van grants towards ultra-low emission vehicle (ULEV) cars and vans, as well as various tax incentives including lower rates for Vehicle Excise Duty and Company Car Tax. EV infrastructure is directly supported through workplace charging scheme grants for EV chargepoints for employees and fleets, the Electric Vehicle Homecharge Scheme grants towards home EV chargepoints and the On-street Residential Charging Scheme. Highways England have committed £15m to ensure EV chargepoints are available every 20 miles on the Strategic Road Network.	2012	Department for Transport	1,605	2,521	3,283	4,094
Heavy goods vehicles Fuel Efficiency Policies*	Yes	Transport	CO2	Efficiency improvements of vehicles (Transport), Low carbon fuels/ electric cars (Transport)	Economic, Regulatory, Research	Implemented	EC Regulation 661/2009 sets minimum requirements and introduces 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, which encourages members to record, report and reduce emissions from freight. The Mode Shift Revenue Support scheme encourages modal shift from road to rail or inland waterway where the costs are higher than road, and where there are environmental benefits to be gained. It currently helps to remove around 800,000 lorry journeys a year from Britain's roads. A similar scheme, Waterborne Freight Grant, can provide assistance with the operating costs associated with coastal or short sea shipping.	2012	Department for Transport, Transport Association	476	1,018	1,019	1,012

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Public service vehicles Fuel Efficiency Policies*	Yes	Transport	CO2	Low carbon fuels/ electric cars (Transport), Efficiency improvements of vehicles	Economic	Implemented	The Green Bus Fund (GBF) allowed bus companies and local authorities in England to compete for funds to help them buy new low carbon emission buses. The four rounds of the fund, which ran from 2009- 2014, added around 1250 Low Carbon Emission Buses onto England's roads. The GBF has now been replaced by the Low Emission Bus Fund (LEBS) which offered £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 and the successful bidders were announced in July 2016, adding more than 300 extra low emission buses to fleets.	2006	Department for Transport	137	211	305	306
Renewable Transport Fuel Obligation, (RTFO) – 5% by volume*	Yes	Transport	CO2	Low carbon fuels/ electric cars (Transport), Transport	Regulatory	Implemented	The RTFO set a 4.75% target for biofuel use by diesel and petrol suppliers to be achieved by 2014. Targets are by volume rather than by energy. Implemented the EU Renewables Directive (2009/28/EC).	2007	Department for Transport	2,867	2,916	2,993	3,075
Renewable Transport Fuel Obligation, (RTFO) – Increase target to meet RED*	Yes	Transport	CO2	Low carbon fuels/ electric cars (Transport), Efficiency improvement of vehicles	Regulatory	Implemented	This policy sets enhanced overall targets of 9.75% (by volume) for biofuel use by diesel and petrol suppliers by 2020 and at least 12.4% in 2032. It implements the EU Renewables Directive (2009/28/EC) as amended by the ILUC Directive (2015/1513).	2018	Department for Transport	2,802	3,298	3,386	3,216
Local Sustainable Transport Fund*	Yes	Transport	CO2	Modal shift to public transport or non-motorized transport (Transport), Improved transport infrastructure (Transport), Low carbon fuels/electric cars (Transport), Improved behaviour (Transport), Modal shift to public transport or non-motorised transport	Economic	Implemented	£600m of capital and revenue funding was provided between 2011 and 2015 to support sustainable travel investments by Local Government. The projects included 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 through competitive bidding processes. Since then central Government has made funding of £65m (2015/16) and £20m p.a. (2016/17 to 2019/20) available for similar schemes.	2011	Bids submitted to Department for Transport, Department for Transport	510	393	329	293

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Rail Electrification*	Yes	Transport	CO2	Improved transport infrastructure (Transport), Transport, Reduce travel times and costs	Other (Other)	Implemented	Major programme of rail electrification underway to replace older diesel trains with modern, low-emission electric trains. This means that operators are contractually obliged to meet emissions levels based on running modern electric rather than diesel traction. Trans Pennine Express (TPE) and Northern are examples where 11% and 17% reductions in CO2e emissions per vehicle km respectively where contracted based on electrification schemes. Reducing costs: electric trains tend to be cheaper to buy, operate and maintain than diesels. They are also lighter so do less damage to the track. So whilst there is clearly a large capital cost associated with installing new electrification infrastructure, this can be compensated over time by the lower operational costs of electric trains. Increasing capacity and reliability and reducing journey times: electric trains tend to outperform equivalent diesels in terms of reliability, acceleration and carrying capacity. Reducing environmental impacts: electric trains are quieter and more carbon efficient than diesels and zero emission at point of use which helps with local air quality.	2013	Department for Transport, Network Rail	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Renewables Obligation*[1]	Yes	Energy	CO2	Increase in renewable energy (Energy supply)	Regulatory, Economic	Implemented	Set 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 paying a 'fine' into the RO Buy Out Fund, which is then redistributed to other energy suppliers who have met their obligation.	2002	Department for Business, Energy and Industrial Strategy (BEIS), Office of Gas and Electricity Markets (Ofgem)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Feed-In Tariffs (FITs)*[1]	Yes	Energy	CO2	Increase in renewable energy (Energy supply)	Regulatory, Economic	Implemented	Feed-in Tariffs (FITs) support organisations, businesses, communities and individuals to generate low-carbon electricity using small-scale (5 MW or less total installed capacity) systems. Electricity suppliers are obliged to pay the regulated tariffs to eligible generators.	2010	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

Name of mitigation action	*Included in with measures GHG projection scenario*	*Sector(s) affected*	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument*	*Status of implementation*	*Brief description*	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2020*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2025*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2030*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2035*
Contract for Difference (2014-2020)*[1]	Yes	Energy	CO2	Increase in renewable energy (Energy supply), Switch to less carbon-intensive fuels (Energy supply), Enhanced non-renewable low carbon generation (nuclear) (Energy supply)	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 to new capacity 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 for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Contract for Difference (2021-2035) [1]	No	Energy	CO2	Increase in renewable energy (Energy supply), Switch to less carbon-intensive fuels (Energy supply), Enhanced non-renewable low carbon generation (nuclear) (Energy supply)	Economic	Planned	Planned continuation of Contracts for Difference (CfDs) for new low carbon capacity after 2020.	2021	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Carbon Price Floor*[1]	Yes	Energy	CO2	Increase in renewable energy (Energy supply), Switch to less carbon-intensive fuels (Energy supply), Enhanced non-renewable low carbon generation (nuclear) (Energy supply)	Fiscal	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 for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
EU Emissions Trading System*	Yes	Energy	CO2	Increase in renewable energy (Energy supply), Switch to less carbon-intensive fuels (Energy supply), Enhanced non-renewable low carbon generation (nuclear) (Energy supply)	Economic, Fiscal, Regulatory	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 (CO2) and other greenhouse gases at least cost.	2005	European Commission, Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
New Energy Supply policies	Yes	Energy	CO2	Increase in renewable energy (Energy supply), Switch to less carbon-intensive fuels (Energy supply), Enhanced non-renewable low carbon generation (nuclear) (Energy supply)	Regulatory, Economic, Fiscal	Implemented	Combined impact of electricity supply and decarbonisation policies. Measures quantified in this group are indicated in this table with a label '[1]'.	2002	Department for Business, Energy and Industrial Strategy (BEIS), Office of Gas and Electricity Markets (Ofgem)	50059	61798	50896	69265

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Woodland Carbon Code*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF)	Voluntary Agreement	Implemented	Voluntary Code and associated carbon registry (2013) for UK domestic woodland carbon schemes to encourage private sector funding for woodland creation projects. Recognised as component of net GHG emissions reporting for businesses in Government's Environmental Reporting Guidelines.	2011	Forestry Commission	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Revised UK Forestry Standard*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF), Sustainable forest management	Regulatory, Information	Implemented	Revised (2017) national standard for sustainable forest management, previously revised in 2011 to include a new guideline on climate change, covering both adaptation and mitigation.	2011	Forestry Commission	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Grown in Britain*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF), Sustainable forest management	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 Environment Food and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Rural Development Programme (2015)*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF), Sustainable forest management	Economic	Implemented	Woodland creation grants provided through EU co-financed Rural Development Programmes in England.	2015	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Woodfuel Implementation Plan*[2]	Yes	Energy	CO2	Increasing biomass supply, primarily for small to medium scale heat applications.	Economic, Information, Education	Implemented	Initiative to develop supply chains, including through support for harvesting/processing and woodland access, to increase woodfuel supply from existing woodland.	2011	Forestry Commission	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Nitrates Action Plan*	Yes	Agriculture	N2O	Reduction of fertilizer/ manure use on cropland (Agriculture)	Regulatory, Information	Implemented	This ensures 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 each NVC. It includes also code of good practice for areas outside NVZs.	2013	Department for Food, Environment and Rural Affairs (DEFRA), Environment Agency (EA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Catchment Sensitive Farming*	Yes	Agriculture	N2O	Activities improving grazing land or grassland management (Agriculture), Improved management of organic soils (Agriculture)	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)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

Name of mitigation action	*Included in with measures GHG projection scenario*	*Sector(s) affected*	*GHG(s) affected*	*Objective and/or activity affected*	*Type of instrument*	*Status of implementation*	*Brief description*	*Start year of implementation*	*Implementing entity or entities*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2020*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2025*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2030*	*Estimate of mitigation impact (not cumulative, in kt CO_2 eq) 2035*
Soils For Profit*	Yes	Agriculture	N2O	Activities improving grazing land or grassland management (Agriculture), Improved management of organic soils (Agriculture)	Education	Implemented	Provides on farm reviews and training on soils manures and nutrients. The programme closed in 2013.	2009	Natural England (NE)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Countryside Stewardship*	Yes	Agriculture	N2O	Activities improving grazing land or grassland management (Agriculture), Improved management of organic soils (Agriculture)	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)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Waste measures*	Yes	Waste management/ waste	CH4	Enhanced recycling (Waste), Reduced landfilling (Waste), Demand management / reduction (Waste), Enhanced CH4 collection and use (Waste), Improved treatment technologies (Waste), Improved landfill management (Waste), Waste incineration with energy use (Waste)	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 CH4 emissions.	1996	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Ozone depleting substances regulation*	Yes	Industry/ industrial processes	HFCs	Reduction of emissions of fluorinated gases (Industrial processes), Installation of abatement technologies (Industrial processes), Replacement of fluorinated gases by other substances (Industrial processes), Improved control of fugitive emissions from industrial processes (Industrial processes)	Regulatory	Implemented	This regulation implements obligations under the Montreal Protocol and EU Regulation 1005/2009/EC on ozone depleting substances. With the exemption of some critical use exemptions, CFCs, HCFCs and halon use is banned. Most ozone depleting substances are potent greenhouse gases, so reductions in their use protects both the ozone layer and climate.	2009	Department for Environment, Food and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

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F-gas regulation (2015)*	Yes	Industry/ industrial processes	HFCs, PFCs, SF6	Reduction of emissions of fluorinated gases (Industrial processes)	Regulatory	Implemented	This introduced a 79% phase down in the quantities of hydrofluorocarbons that can be placed on the EU market and was 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; and some strengthening of obligations in the 2007 regulation relating to leak checking, repairs, F gas recovery and technician training.	2015	Department for Food, Environment and Rural Affairs (DEFRA)	3533	7283	10850	12980
Climate Change Levy (CCL)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Economic, Fiscal	Implemented	The Climate Change Levy (CCL) was introduced in 2001. It is levied on the supply of energy to business and public sector consumers to incentivise them to reduce energy consumption. Each of the four main groups of taxable commodities (electricity, gas, solid fuels, and liquefied petroleum gas [LPG]) has its own main rate per unit of energy. Eligible energy-intensive industries may pay reduced main rates of CCL through CCAs, or be exempt from the CCL (for mineralogical/ metallurgical processes). Budget 2016 announced that CCL rates will increase from April 2019, moving to an electricity-to-gas ratio of 2.5:1 compared to the previous 2.9:1 ratio. In the longer term, the Government intends to rebalance the rates further, reaching a ratio of 1:1 by 2025. CCL rates to April 2022 were announced at Budget 2018, however changes between 2022 and 2025, as well as the rates from 2025 onwards, have not yet been announced.	2001	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Energy Performance of Buildings Directive (EPBD) 2017 Cost Optimal Review and Nearly Zero Energy Buildings (NZEB) (2018 and 2020)	No	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	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	Ministry of Housing, Communities & Local Government (MHCLG)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

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Sustainable Energy-Using Products – Pre-Low Carbon Transition Plan*	Yes	Energy	CO2	Efficiency improvement of appliances (Energy consumption)	Regulatory	Implemented	The EU Ecodesign Directive and the Energy Labelling Framework Regulation operate by setting minimum performance and information requirements (respectively) for energy-using products. They aim to take the least efficient products off the market and to give consumers clear energy use-related information to guide their purchasing decisions. This is implemented through product-specific EU regulations.	2008	Department for Business, Energy and Industrial Strategy (BEIS)	2185	1068	369	-333
Additional Renewables in Generation (Renewable Energy Strategy)*[1]	Yes	Energy	CO2	Increase in renewable energy (Energy supply)	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 for Business, Energy and Industrial Strategy (BEIS), Office of Gas and Electricity Markets (Ofgem)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Capacity Mechanism*[1]	Yes	Energy	CO2	Increase in renewable energy (Energy supply), Switch to less carbon-intensive fuels (Energy supply)	Economic	Implemented	Part of the Government's Electricity Market Reform package, the Capacity Mechanism ensures security of electricity supply by encouraging investments in electricity generation capacity.	2017	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Heat Networks Investment Project*	Yes	Energy	CO2	Switch to less carbon-intensive fuels (Energy supply)	Economic	Implemented	The heat networks investment project (HNIP) is a capital funding scheme across England and Wales to encourage the development of heat networks. The scheme will be open for applications from heat networks for up to three years and allocate commercialisation and construction funding through a competitive process. The key objective of the project is to build a sustainable market for heat networks to support the decarbonisation of heat in buildings, helping the UK reach the carbon budget targets.	2017	Department for Business, Energy and Industrial Strategy (BEIS)	-63	-88	-96	43
Forestry Act Felling Licence Regulations and Environmental Impact (Forestry) regulations*[2]	Yes	Forestry/ LULUCF	CO2	Prevention of deforestation (LULUCF)	Regulatory	Implemented	Strong regulatory framework that controls felling. It only allows deforestation for purposes of nature conservation and prevents the afforestation of deep peat. Legislation updated 1999 and 2017.	1999	Forestry Commission (FC)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

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Natural England's Strategic Approach to the Restoration of Blanket Bog	Yes	Forestry/ LULUCF	CO2	Restoration of degraded lands (LULUCF)	Information	Implemented	Natural England published the Strategy for the Restoration of Blanket Bog in England in 2015. The approach sets out the extent, nature and importance of the blanket bog resource across England and what is currently being done to conserve it, as well as setting out the required management and timeframe for delivery to achieve an improvement in site condition across the resource at a strategic level.	2015	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Natural Environment White Paper (NEWP) targets on horticultural peat	Yes	Forestry/ LULUCF	CO2	Restoration of degraded lands (LULUCF)	Information	Implemented	The Sustainable Growing Media Taskforce was set up to look at ways in which the barriers to the use of peat alternatives could be overcome. The Government published its response to the Task Force's report and draft roadmap in 2013 which set out where our resources will be focused.	2011	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Peatland Area Designations	Yes	Forestry/ LULUCF	CO2	Restoration of degraded lands (LULUCF)	Regulatory	Implemented	According to the UK's draft integrated National Energy and Climate Plan (NECP), 3 out of 12 Nature Improvement Areas (NIA, 2012) are focussed on peatland restoration. 47% England's wetlands are protected by Sites of Special Scientific Interest (SSSIs).	2004	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Peatland Code	Yes	Forestry/ LULUCF	CO2	Restoration of degraded lands (LULUCF)	Voluntary Agreement, Information, Economic	Implemented	A UK Voluntary Code to encourage and support private sector funding for peatland restoration projects. Provides standards and robust science to give business supporters confidence that their financial contribution is making a measurable and verifiable difference.	2011	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Rural Development Programme (2007)*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF), Enhanced forest management (LULUCF)	Economic	Implemented	Woodland creation grants provided through EU co-financed Rural Development Programmes in England.	2007	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
CAP Cross Compliance*	Yes	Agriculture, Forestry/ LULUCF	CO2	Improved management of organic soils (Agriculture)	Regulatory	Implemented	Good Agricultural and Environmental Conditions in place to ensure minimum soil cover, to maintain soil organic matter and to minimise erosion. Implementation of the Nitrates Directive Retention of permanent pasture (up to 2014 – now under Greening measures)	2015	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Woodland Carbon Fund*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF)	Economic	Implemented	The Woodland Carbon Fund is an exchequer-funded grant to support the creation of large-scale productive woodlands which also enhance natural capital.	2016	Forestry Commission (FC)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

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Woodland Creation Planning Grant*[2]	Yes	Forestry/ LULUCF	CO2	Afforestation and reforestation (LULUCF)	Economic, Regulatory	Implemented	Grant to support the planning of large-scale productive woodlands, compliant with the UK Forestry Standard.	2015	Forestry Commission (FC)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Industrial Emissions Directive (as it applies to Large Combustion Plant Directive)*[1]	Yes	Industry/ industrial processes	CO2, CH4, N2O	Improved control of fugitive emissions from industrial processes (Industrial processes), Efficiency improvement in industrial end-use sectors (Energy consumption)	Regulatory	Implemented	As transposed into UK law, the IED replaced the LCPD from 1 January 2016 with similar (although more stringent) provisions set out in chapter III of the Industrial Emissions Directive (2010/75/EU) (IED). Those provisions apply in respect to any plant newly permitted since 7 January 2013. Three compliance routes are available to generating plants; to abate emissions and comply with more stringent limits by 2020; to comply with less stringent limits but face a 1,500 hour per year load factor constraint; or to close by 2023.	2016	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Large Combustion Plant Directive*[1]	Yes	Industry/ industrial processes	CH4, CO2, N2O	Efficiency improvement in industrial end-use sectors (Energy consumption)	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. This has now been replaced by the Industrial Emissions Directive.	2007	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Common Agricultural Policy (CAP) Greening*	Yes	Agriculture, Forestry/ LULUCF	CO2	Activities improving grazing land or grassland management (Agriculture)	Regulatory	Implemented	Obtain consent before improving grassland that has not been cultivated for 15 years or more (Environmental Impact Assessment/ EIA). Select a range of Ecological Focus Area (EFA) measures to meet new standards: relevant actions include enhanced buffer strips, cover crops and growing N-fixing crops	2015	Department for Food, Environment and Rural Affairs (DEFRA)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated
Amendments to Heat Networks Metering & Billing Regulations (2014)	No	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Regulatory	Planned	UK legislation requiring heat network operators to submit data on networks and to install heat meters/heat cost allocators in buildings on networks unless it is not cost-effective to do so. The amendments will revise the cost-effectiveness methodology and address ambiguities in the existing legislation	2020	Department for Business, Energy and Industrial Strategy (BEIS)	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated	Mitigation impact not estimated

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Energy company obligation 3 (ECO 3)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Regulatory	Implemented	The 2015 Spending Review announced that ECO will be replaced with a new, lower cost scheme that will run for 5 years (to March 2022) and will tackle the root causes of fuel poverty. The 5-year extension will take place in the two phases, with the ECO Extension (April 2017 – Sept 2018) acting as a bridge between the expired ECO scheme and the new fuel poverty focused scheme, ECO 3, which will run from December 2018 to March 2022.	2017	Department for Business, Energy and Industrial Strategy (BEIS)	140	182	172	165
Boiler Plus (technical standards for domestic boiler installations)*	Yes	Energy	CO2	Efficiency improvements of buildings (Energy consumption)	Regulatory	Implemented	The policy objectives are to deliver additional energy and carbon savings from the domestic heating sector in England by lowering overall gas demand from domestic properties. It aims to do this by increasing the deployment of devices which increase the efficiency of domestic heating systems, through controls and measures to make gas boilers heat homes more efficiently. The policy instrument is a technical standard set through statutory guidance under the Building Regulations framework. This requires existing households in England to install an additional energy saving measure from a choice list at the point of installing a new or replacement combi gas boiler in an existing dwelling	2018	Department for Business, Energy and Industrial Strategy (BEIS)	147	391	635	586
Industrial Heat Recovery Support (IHRS)*	Yes	Industry/ industrial processes	CH4, CO2, N2O	Efficiency improvement in industrial end-use sectors (Energy consumption)	Economic, Information	Implemented	The policy aims to: increase industry confidence to invest in the technology potential to recover heat from industrial processes, and increase the deployment of such technologies across manufacturing and data centres in England and Wales. It establishes a fund for feasibility studies that examine the potential for industrial businesses to adopt heat recovery technologies and a fund to subsidise the deployment of heat recovery technologies.	2018	Department for Business, Energy and Industrial Strategy (BEIS)	123	112	87	10

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Streamlined energy and carbon reporting framework for business (SECR)*	Yes	Energy	CO2	Efficiency improvement in industrial end-use sectors (Energy consumption)	Information, Regulatory	Adopted	SECR is a reporting framework which obligates all large (as defined by the Companies Act 2006) UK registered companies to report their energy use and associated emissions relating to electricity, gas and transport in their annual reports. Companies will also be required to provide an intensity metric and disclose any energy efficiency actions undertaken during the reporting period. Quoted companies will in addition be required to report their global energy use and GHG emissions.	2019	Department for Business, Energy and Industrial Strategy (BEIS)	532	447	400	358

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

[1] – This action is not quantified in isolation, but its impact is included in the emission savings for 'New Energy Supply Policies'.

[2] – This action is not quantified in isolation, but its impact is included in the emission savings for 'Forestry Policies'.

Table 4
Reporting on progress

Year	Base year (1990)	2010	2011	2012	2013	2014	2015	2016	2017	Comment
Total emissions excluding LULUCF (kt CO_2 eq)	797,947.89	614,360.62	567,160.79	583,652.53	569,901.74	529,502.81	511,980.26	487,034.99	474,346.12	Total GHG including domestic aviation, indirect CO_2, excluding LULUCF, excluding international aviation
Contribution from LULUCF (kt CO_2 eq)	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not applicable: Numbers for LULUCF are not reported because this sector is not included under the Convention target
Quantity of units from market based mechanisms under the Convention[1] (number of units and kt CO_2 eq)	NA	NO	NO	NO	NO	NO	2,003,378.00 units 2,003,378.41 kt CO_2 eq	NO	NO	NO is not occurring: no units were surrendered in those years
Quantity of units from other market based mechanisms (number of units and kt CO_2 eq)	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not applicable: No "other" market based mechanisms are in use.

(1) In 2015 there were a significant number of AAUs retired as part of the compliance procedure for the first Kyoto Protocol true-up period.

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 and 4, of the Kyoto Protocol

GREENHOUSE GAS SOURCE AND SINK ACTIVITIES	*Base year*	*Net emissions/removalse*									*Accounting Parameters*[n]	*Accounting Quantity*[i]
		2013	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*Totalg*		
		(kt CO_2 eq)										
A. Article 3.3 activities												
A.1. Afforestation/reforestation		-1,208.95	-1,485.40	-1,817.48	-2,138.66	-2,440.76				-9,091.25		-9,091.25
Excluded emissions from natural disturbances		NA	NA	NA	NA	NA				NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA	NA	NA				NA		NA
A.2. Deforestation		1,212.44	1,325.05	1,249.48	1,610.47	1,439.05				6,836.49		6,836.49
B. Article 3.4 activities												
B.1. Forest management										-91,468.46		-3,208.46
Net emissions/removalse		-19,097.08	-18,660.53	-18,247.14	-17,985.44	-17,478.27				-91,468.46		
Excluded emissions from natural disturbances		NO	NO	NO	NO	NO				NO		NO
Excluded subsequent removals from land subject to natural disturbances		NO	NO	NO	NO	NO				NO		NO
Any debits from newly established forest (CEF-ne)		NO	NO	NO	NO	NO				NO		NO
Forest management reference level (FMRL)											-8,268.00	
Technical corrections to FMRL											-9,384.00	
Forest management capl											224,517.59	-3,208.46
B.2. Cropland management (if elected)	14,401.10	13,025.57	12,818.23	12,773.90	12,656.12	12,589.48				63,863.29		-8,142.20
B.3. Grazing land management (if elected)	-6,768.73	-5,558.15	-5,603.80	-5,675.97	-5,724.53	-5,789.73				-28,352.18		5,491.47
B.4. Revegetation (if elected)	NA	NA	NA	NA	NA	NA				NA		NA
B.5. Wetland drainage and rewetting (if elected)	NE	NE	NE	NE	NE	NE				NE		NE

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

Units of market based mechanisms			Year	
			2017	2018
Kyoto Protocol units[d]	*Kyoto Protocol units*	*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO
	AAUs	*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO
	ERUs	*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO
	CERs	*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO
	tCERs	*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO
	lCERs	*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO
Other units[d]	*Units from market-based mechanisms under the Convention*	*(number of units)*		
		(kt CO_2 eq)		
	Units from other market-based mechanisms	*(number of units)*		
		(kt CO_2 eq)		
	Units from market-based mechanisms under the Convention	*(number of units)*		
		(kt CO_2 eq)		
Total		*(number of units)*	NO	NO
		(kt CO_2 eq)	NO	NO

Abbreviations: AAUs = assigned amount units, CERs = certified emission reductions, ERUs = emission reduction units, lCERs = long-term certified emission reductions, tCERs = temporary certified emission reductions, NO =not occurring,

Note: 2019 is the latest reporting year.

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 and assumptions used in the projection analysis[a]

						Historical								*Projected*		
Key Underlying assumptions	*Unit*	*1990*	*1995*	*2000*	*2005*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2017*	*2020*	*2025*	*2030*	*2035*
EU ETS carbon price	EUR/EUA, 2018 prices	NO	NO	NO	22.78	16.35	14.56	8.1	4.82	6.32	8.11	5.92	15.2	18.97	45.73	45.73
Electricity generation carbon price – includes Carbon Price Support Levy	EUR/EUA, 2018 prices	NO	NO	NO	22.78	16.35	14.56	8.1	9.52	17.37	31.31	26.78	34.76	35.6	45.73	106.4
Pound Sterling to Euro exchange rate	EUR per GBP	1.52	1.52	1.64	1.46	1.17	1.15	1.23	1.18	1.24	1.38	1.14	1.1	1.07	1.07	1.07
Pound Sterling to US Dollars exchange rate	USD per GBP	1.79	1.58	1.52	1.82	1.55	1.6	1.59	1.56	1.65	1.53	1.29	1.38	1.42	1.42	1.42
UK GDP growth rate	per cent/per annum	NO	NO	NO	3.15	1.71	1.64	1.45	2.05	2.95	2.35	1.66	1.29	2.09	2.32	2.32
Crude oil – Brent 1 month	GBP/bbl, 2018 prices	22.98	16.54	26.54	37.65	59.07	77.45	77.6	75.31	63.79	37.11	43.48	51.95	54.66	59.56	59.56
Coal – CIF ARA	GBP/tonne, 2018 prices	42.12	43.25	33.52	41.81	67.93	85.13	63.74	56.65	48.33	38.48	66.4	62.05	60.26	60.97	60.97
Gas – NBP	GBP/therm, 2018 prices	NE	NE	8.61	17.4	16.29	21.33	22.48	25.03	18.08	15.49	15.59	16.38	19.11	21.5	21.5
Number of households	millions	22.64	23.54	24.39	25.34	26.32	26.52	26.71	26.94	27.21	27.48	28.03	28.81	30.04	31.23	32.33
Population	thousands	57,237.5	58,024.8	58,886.1	60,413.3	62,759.5	63,285.1	63,705	64,105.7	64,596.8	65,110	66,040.2	67,254.54	68,927.52	70,369.95	71,588.73

Note:

Abbreviations: NE = not estimated, NO = not occurring.

CRF Table 6(a)

Information on updated greenhouse gas projections under a 'with existing measures' scenario

		GHG Emissions & Removals[3]								*GHG Projections*			
		(kt CO_2 eq)								*(kt CO_2 eq)*			
Sector		*Base Year*[1]	*1990*	*1995*	*2000*	*2005*	*2010*	*2015*	*2017*	*2020*	*2025*	*2030*	*2035*
Other:	Energy Supply[2]	279,115	279,115	239,433	222,971	232,773	208,822	146,699	113,921	70,865	60,345	57,650	46,451
Other:	Business[2]	114,207	114,207	112,022	115,756	109,307	94,434	85,374	80,445	82,876	72,963	69,408	68,912
Other:	Industrial Processes[2]	59,938	59,938	50,825	27,095	20,568	12,643	12,719	10,837	10,655	9,786	9,427	9,180
Other:	Transport[2]	129,612	129,612	131,101	134,886	137,757	126,131	125,095	127,490	116,538	109,663	105,425	102,815
Other:	Residential[2]	80,305	80,305	81,910	89,058	86,110	87,925	67,795	67,371	68,340	70,727	73,516	77,616
Other:	Public[2]	13,498	13,498	13,277	12,105	11,174	9,469	7,972	7,819	6,977	6,951	7,491	7,814
Other:	Agriculture[2]	54,406	54,406	53,339	50,716	48,203	44,936	45,448	45,907	44,545	42,452	41,604	41,241
Other:	LULUCF[2]	255	255	-1,711	-3,875	-7,115	-9,110	-9,712	-9,893	-15,634	-14,015	-10,575	-8,139
Other:	Waste[2]	66,891	66,891	69,405	63,115	49,289	30,014	20,889	20,566	16,687	14,743	13,835	13,279
Gas													
CO_2	Emissions including Net CO_2 from LULUCF	599,468	599,468	563,421	561,910	561,543	501,958	411,944	376,771	321,707	300,750	300,184	294,173
CO_2	excluding Net CO_2 from LULUCF	601,481	601,481	567,354	567,902	570,497	512,672	423,122	388,101	338,888	316,485	312,596	304,199
CH_4	Emissions including Net CH_4 from LULUCF	133,029	133,029	126,462	108,946	87,412	64,347	53,119	51,923	47,422	44,188	42,252	41,315
CH_4	excluding Net CH_4 from LULUCF	133,013	133,013	126,435	108,917	87,376	64,312	53,099	51,895	47,387	44,156	42,225	41,292
N_2O	Emissions including Net N_2O from LULUCF	48,380	48,380	38,725	28,642	24,518	21,483	20,435	20,679	20,756	20,542	20,159	20,087
N_2O	excluding Net N_2O from LULUCF	46,128	46,128	36,531	26,554	22,716	19,913	18,989	19,271	19,244	18,855	18,349	18,224
HFCs		14,391	14,391	19,096	9,884	13,132	16,487	15,988	14,193	11,159	7,316	4,328	2,688
PFCs		1,652	1,652	597	597	385	288	327	371	354	354	354	354
SF_6		1,305	1,305	1,300	1,848	1,074	703	465	525	451	466	506	551
NF_3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total with LULUCF		798,226	798,226	749,600	711,827	688,066	605,265	502,278	464,463	401,849	373,616	367,783	359,169
Total without LULUCF		797,970	797,970	751,312	715,701	695,181	614,375	511,990	474,356	417,483	387,631	378,358	367,308

Notes:

1 Base year of 1990

2 UK National Communications sectors

3 GHG Emissions & Removals are reported for UNFCCC coverage from the latest (2019) inventory

Abbreviations:

NA = not applicable

Numbers are reported on UNFCCC coverage and as such will not precisely match nationally published equivalents.

CRF Table 6(b)

Information on updated greenhouse gas projections under a 'with additional measures' scenario

		GHG Emissions & Removals[3]								*GHG Projections*			
		(kt CO_2 eq)								*(kt CO_2 eq)*			
Sector		*Base Year*[1]	*1990*	*1995*	*2000*	*2005*	*2010*	*2015*	*2017*	*2020*	*2025*	*2030*	*2035*
Other:	Energy Supply[2]	279,115	279,115	239,433	222,971	232,773	208,822	146,699	113,921	70,528	61,236	54,140	40,269
Other:	Business[2]	114,207	114,207	112,022	115,756	109,307	94,434	85,374	80,445	82,833	72,869	69,355	68,793
Other:	Industrial Processes[2]	59,938	59,938	50,825	27,095	20,568	12,643	12,719	10,837	10,652	9,783	9,423	9,182
Other:	Transport[2]	129,612	129,612	131,101	134,886	137,757	126,131	125,095	127,490	116,538	109,659	105,430	102,867
Other:	Residential[2]	80,305	80,305	81,910	89,058	86,110	87,925	67,795	67,371	68,342	70,581	73,363	77,458
Other:	Public[2]	13,498	13,498	13,277	12,105	11,174	9,469	7,972	7,819	6,977	6,951	7,492	7,818
Other:	Agriculture[2]	54,406	54,406	53,339	50,716	48,203	44,936	45,448	45,907	44,545	42,448	41,605	41,251
Other:	LULUCF[2]	255	255	-1,711	-3,875	-7,115	-9,110	-9,712	-9,893	-15,634	-14,015	-10,575	-8,139
Other:	Waste[2]	66,891	66,891	69,405	63,115	49,289	30,014	20,889	20,566	16,687	14,743	13,835	13,279
Gas													
CO_2	Emissions including Net CO_2 from LULUCF	599,468	599,468	563,421	561,910	561,543	501,958	411,944	376,771	321,328	301,385	296,476	287,802
CO_2	excluding Net CO_2 from LULUCF	601,481	601,481	567,354	567,902	570,497	512,672	423,122	388,101	338,509	317,120	308,889	297,828
CH_4	Emissions including Net CH_4 from LULUCF	133,029	133,029	126,462	108,946	87,412	64,347	53,119	51,923	47,420	44,189	42,248	41,307
CH_4	excluding Net CH_4 from LULUCF	133,013	133,013	126,435	108,917	87,376	64,312	53,099	51,895	47,386	44,157	42,220	41,283
N_2O	Emissions including Net N_2O from LULUCF	48,380	48,380	38,725	28,642	24,518	21,483	20,435	20,679	20,755	20,546	20,155	20,075
N_2O	excluding Net N_2O from LULUCF	46,128	46,128	36,531	26,554	22,716	19,913	18,989	19,271	19,243	18,859	18,345	18,213
HFCs		14,391	14,391	19,096	9,884	13,132	16,487	15,988	14,193	11,159	7,316	4,328	2,688
PFCs		1,652	1,652	597	597	385	288	327	371	354	354	354	354
SF_6		1,305	1,305	1,300	1,848	1,074	703	465	525	451	466	506	551
NF_3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total with LULUCF		798,226	798,226	749,600	711,827	688,066	605,265	502,278	464,463	401,468	374,256	364,067	352,777
Total without LULUCF		797,970	797,970	751,312	715,701	695,181	614,375	511,990	474,356	417,102	388,271	374,642	360,916

Notes:

1 Base year of 1990

2 UK National Communications sectors

3 GHG Emissions & Removals are reported for UNFCCC coverage from the latest (2019) inventory

Abbreviations: NA = not applicable

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 2017

	2017								
Allocation channels	*Domestic currency (£m)*					*USD ($m)*			
	Core/general	*Climate-specific*				*Core/general*	*Climate-specific*		
		Mitigation	*Adaptation*	*Cross-cutting*	*Other*		*Mitigation*	*Adaptation*	*Cross-cutting*	*Other*
"Total contributions through multilateral channels "	1,783.43			154.3		2,295.28			198.58	
Multilateral climate change funds	31.5			154.3		40.54			198.58	
Other multilateral climate change funds										
Multilateral financial institutions, including regional development banks	1,636.78					2,106.54				
Specialised United Nations bodies	115.15					148.21				
Total contributions through bilateral, regional and other channels		375.44	372.91	-0.11			483.13	479.94	-0.17	
Total climate specific by funding type (total for mitigation, adaptation, crosscutting, other)	1,783.43	375.44	372.91	154.19		2,295.29	483.13	479.94	198.41	
Total climate specific finance		902.54					1,161.48			

2017 Exchange rate $1 = £0.777 (source: Annual exchange rates for DAC donor countries)

Provision of information on definitions or methodologies used for reporting information in the following reporting parameters:

1: Core/general	The UK has reported the core contributions it has made to the listed multilaterals, plus some other contributions. These contributions are to the core budget and the UK cannot specify these as climate specific.
2: Climate-specific	"The UK has reported climate specific contributions through multilateral channels. For the Green Climate Fund, we have counted 100% of our contribution as climate specific. For the Global Environment Facility, this has a wider remit than climate and therefore have accounted for this in the amount scored as climate specific. For the purposes of reporting we have scored these climate specific contributions as split 50% adaption and 50% mitigation. Our contributions through other channels are identfied as climate specific as they are funded from the UK's dedicated ring fence of climate finance with clear climate change objectives. The business cases for these programmes are scrutnised to ensure they comply with these objectives. Building on the provision of £3.87 billion in International Climate Finance (ICF) between 2011/12- 2015/16, the UK has committed to further scale up climate finance to at least £5.8 billion between 2016/17-2020/21. This represents a new, dedicated climate commitment which is additional to historic (ODA) levels and has not diverted funds from existing development spending. "
3: Status – disbursed and committed	The UK has categorised spend to multilaterals and bilaterals as 'committed'. The reported finance is the amount recorded as spent for UK Government budgetary purposes. Therefore we do not account for spend that has been pledged or committed for future years, but we do account for spend using promissory notes. These represent a legal promise for the UK to provide to total value of the promissory note, to the note's recipient.
4: Funding source	The UK has reported annual spend from its International Climate Finance (ICF) – a dedicated ring fence of the UK's ODA budget for climate finance.
5: Financial instrument	The UK has provided the majority of it's climate finance via grants. The exceptions to this are four bilateral contributions that are marked as equity and one bilateral contribution marked as loan/equity. The spend for these instruments is accounted for in accordance with OECD-DAC requirements
6: Type of support	All of reported UK climate finance is ODA. As part of our return, the UK has reported reflows of climate finance for example due to programmes closing down or no longer requiring UK finance. These reflows count as negative ODA and therefore affect the overall spend totals. We have grouped these reflows under the appropriate thematic area in order to properly account for their impact on the reported spend.
7: Sector	The UK has reported the same sector for each programme as per its overall ODA reporting to the OECD-DAC that took place earlier in the year.

Table 7
Provision of public financial support: summary information in 2018

	2018									
Allocation channels	*Domestic currency (£m)*					*USD ($m)*				
	Core/general	*Climate-specific*				*Core/general*	*Climate-specific*			
		Mitigation	*Adaptation*	*Cross-cutting*	*Other*		*Mitigation*	*Adaptation*	*Cross-cutting*	*Other*
Total contributions through multilateral channels	2,374.25			217.29		3,167.00			289.86	
Multilateral climate change funds	31.5			214.66		42.00			286.21	
Other multilateral climate change funds				6.5					8.67	
Multilateral financial institutions, including regional development banks	2,219.93					2,959.91				
Specialised United Nations bodies	123.82			2.73		165.09			3.64	
Total contributions through bilateral, regional and other channels		487.22	460.26	3.80			649.62	613.66	5.06	
Total climate specific finance			1,168.67					1,558.19		

2018 Exchange rate $1 = £0.750 (source: Annual exchange rates for DAC donor countries)

Provision of information on definitions or methodologies used for reporting information in the following reporting parameters:	
1: Core/general	The UK has reported the core contributions it has made to the listed multilaterals, plus some other contributions. These contributions are to the core budget and the UK cannot specify these as climate specific.
2: Climate-specific	"The UK has reported climate specific contributions through multilateral channels. For the Green Climate Fund, we have counted 100% of our contribution as climate specific. For the Global Environment Facility, this has a wider remit than climate and therefore have accounted for this in the amount scored as climate specific. For the purposes of reporting we have scored these climate specific contributions as split 50% adaption and 50% mitigation. Our contributions through other channels are identfied as climate specific as they are assessed as having clear climate change objectives. Building on the provision of £3.87 billion in International Climate Finance (ICF) between 2011/12- 2015/16, the UK committed to further scale up climate finance to at least £5.8 billion between 2016/17-2020/21. Since parties to the UNFCCC committed to providing new and additional fast-start finance from 2010, the scale up in climate finance has been accompanied by a significant scale up in UK ODA from £7.3 billion in 2009 to £14.6 billion in 2018. UK Climate Finance committments therefore represents a new, dedicated climate commitment which is additional to historic ODA levels. We have furthered this commitment through a recent announcement of £11.6bn in ICF from 2021-2025."
3: Status – disbursed and committed	The UK has categorised spend to multilaterals and bilaterals as 'committed'. The reported finance is the amount recorded as spent for UK Government budgetary purposes. Therefore we do not account for spend that has been pledged or committed for future years, but we do account for spend using promissory notes. These represent a legal promise for the UK to provide to total value of the promissory note, to the note's recipient.
4: Funding source	The UK has reported annual spend from its ODA budget that it has assessed as having clear climate change objectives.
5: Financial instrument	The UK has provided the majority of it's climate finance via grants. The exceptions to this are five bilateral contributions that are marked as equity and one bilateral contribution marked as loan/grant. The spend for these instruments is accounted for in accordance with OECD-DAC requirements
6: Type of support	All of reported UK climate finance is ODA. As part of our return, the UK has reported reflows of climate finance for example due to programmes closing down or no longer requiring UK finance. These reflows count as negative ODA and therefore affect the overall spend totals. We have grouped these reflows under the appropriate thematic area in order to properly account for their impact on the reported spend.
7: Sector	The UK has reported the same sector for each programme as per its overall ODA reporting to the OECD-DAC that took place earlier in the year.

Table 7a

Provision of public financial support: contribution through multilateral channels in 2017

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	31.5	40.54	31.5	40.54	Committed	ODA	Grant	Cross-cutting	Not applicable
2. Least Developed Countries Fund									
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund			122.8	158.04	Committed	ODA	Grant	Cross-cutting	Not applicable
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds									
i) Global Green Growth Insitute									
ii) Climate Investment Funds- Clean Technology Fund									
Sub-total	31.5	40.54	154.3	198.58					
Multilateral financial institutions, including regional development banks									
1. World Bank	1,330.41	1,712.24			Committed	ODA	Grant/Loan		Not applicable
2. International Finance Corporation									
3. African Development Bank	176.39	227.02			Committed	ODA	Grant		Not applicable
4. Asian Development Bank	125.48	161.49			Committed	ODA	Grant		Not applicable
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank									
7. Other	4.50	5.79			Committed	ODA	Grant		Not applicable
Sub-total	1,636.78	2,106.54							
Specialised United Nations bodies									
1. United Nations Development Programme (specific programmes)	55.00	70.79			Committed	ODA	Grant		Not applicable
2. United Nations Environment Programme (specific programmes)									
3. Other	60.15	77.42			Committed	ODA	Grant		Not applicable
Sub-total	115.15	148.20							
Total	1,783.44	2,295.28	154.30	198.58					

Table 7a

Provision of public financial support: contribution through multilateral channels in 2018

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	31.5	42.00	12.70	16.93	Committed	ODA	Grant	Cross-cutting	Unspecified
2. Least Developed Countries Fund									
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund			195.46	260.61	Committed	ODA	Grant	Cross-cutting	Unspecified
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds			6.5	8.67	Committed	ODA	Grant	Cross-cutting	Unspecified
i) Global Green Growth Insitute									
ii) Climate Investment Funds- Clean Technology Fund									
Sub-total	31.50	42.00	214.66	286.21					
Multilateral financial institutions, including regional development banks									
1. World Bank	1,944.13	2,592.17			Committed	ODA	Grant/Loan		Unspecified
2. International Finance Corporation									
3. African Development Bank	152.82	203.77			Committed	ODA	Grant		Unspecified
4. Asian Development Bank	27.50	36.67			Committed	ODA	Grant		Unspecified
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank									
7. Other	95.48	1,27.30			Committed	ODA	Grant		Unspecified
Sub-total	2,219.93	2,959.91							
Specialised United Nations bodies									
1. United Nations Development Programme (specific programmes)	55.00	73.33			Committed	ODA	Grant		Unspecified
2. United Nations Environment Programme (specific programmes)									
3. Other	68.82	91.76	2.73	3.64	Committed	ODA	Grant	Cross-cutting	Unspecified
Sub-total	123.82	165.10	2.73	3.64					
Total	2,375.25	3,167.01	217.39	289.85					

Table 7b

Provision of public financial support: contribution through bilateral, regional and other channels 2017

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Building Resilience and Adaptation to Climate Extremes and Disasters	37.84	48.70	Committed	ODA	Grant	Adaptation	General Environment Protection	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). 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. These will all contribute to the Millennium Development Goals on the eradication poverty and hunger, and environmental sustainability, and also respond to the Humanitarian and Emergency Response Review recommendation that DFID should integrate the threat from climate change into a Disaster Risk Reduction.
CDC Programme of Support in Africa and South Asia (2015-2018)	33.60	43.24	Committed	ODA	Equity	Mitigation	Banking & Financial Services	To enable CDC to scale up its activity of investing and lending to support the building of businesses in developing countries, to create jobs and make a lasting difference to people's lives in some of the world's poorest places. CDC is DFID's main vehicle for investing in private companies in Africa and South Asia. CDC encourages capital investments, including in climate change mitigation and adaptation measures, from other private investors by being a first mover, demonstrating to other investors that commercial returns are possible in these frontier markets, and by sharing risk and expertise. The additional equity from DFID will enable CDC to meet demand for capital in its target markets and allow CDC to sustain a higher volume of more developmental investments across priority regions and business sectors
Productive Safety Net Programme Phase 4	31.82	40.95	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	To reduce hunger, improve livelihoods and reduce the risk of famine in rural Ethiopia by (i) providing cash and food transfers, livelihoods advice and access to microfinance to 1.2 million extremely poor Ethiopians and (ii) creating local infrastructure which reverses environmental degradation and improves access to markets and basic services. 85% of participant households receive transfers as wages for labour on public works projects (including 32,000 km of hillside terraces, 3,000 km of rural roads and 400 new or expanded schools); while the remainder (the elderly, those with disabilities, and pregnant women) receive cash and / or food without a labour requirement. This programme contributes towards national and international development goals and DFID's own targets for reducing poverty and hunger and for building household resilience to climate change and other shocks.
Forest Governance, Markets and Climate	15.67	20.17	Committed	ODA	Grant	Mitigation	Forestry	A global programme supporting governance and market reforms aimed at reducing the illegal use of forest resources, benefitting poor forest-dependent people and promoting sustainable growth in developing countries.
Forest Governance, Markets and Climate	15.67	20.17	Committed	ODA	Grant	Adaptation	Forestry	A global programme supporting governance and market reforms aimed at reducing the illegal use of forest resources, benefitting poor forest-dependent people and promoting sustainable growth in developing countries.
Africa Division funding to the African Agriculture Development Company (AgDevCo)	17.72	22.81	Committed	ODA	Grant	Adaptation	Agriculture	AgDevCo is a specialised investor and project developer focused exclusively on early stage Small and Medium Enterprise agribusiness in Sub Saharan Africa. AgDevCo deploys patient capital and technical assistance to build profitable businesses that contribute to food security, drive economic growth and create jobs and income in rural areas and contribute to farmers' resilience to climate change. It currently operates in Sierra Leone, Ghana, Rwanda, Malawi, Mozambique, Tanzania, Uganda, Zambia.
Building Resilience in the Sahel through Adaptive Social Protection	15.31	19.70	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	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 to climate change and can be scaled in a time of crisis.
TEA – Transforming Energy Access	15.12	19.46	Committed	ODA	Grant	Mitigation	Energy Policy	The project is up to £65 million over five years, to support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy services for poor households and enterprises, especially in Africa. The programme will include: i) partnership with Shell Foundation, enabling support to another 30+ early stage private sector innovations. ii) Innovate UK's Energy Catalyst to stimulate technology innovation by UK enterprises; iii) build other strategic clean energy innovation partnerships (e.g. testing a new 'P2P Solar' crowdfunding platform; and scoping a potential new partnership with Gates Foundation on Mission Innovation); iv) skills and expertise development. To support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy services for poor households and enterprises, especially in Africa
Hunger Safety Net Programme	14.09	18.14	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	To reduce poverty, hunger and vulnerability by providing the poorest households in Kenya's arid and semi-arid lands with cash transfers including in response to climate shocks such as droughts. 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.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Livelihoods and Food Security Trust Fund for Burma (NUTSEM)	12.50	16.09	Committed	ODA	Grant	Adaptation	Agriculture	To improve the incomes and nutrition status of over 1.63 million poor people in Burma by promoting resilient livelihoods and food security food security through agricultural commercialisation and climate smart agriculture, financial inclusion, business and skills development, and targeted nutrition support to mothers and children in the 'One thousand day' window between conception and a child's second birthday.
Solar Nigeria Programme	10.31	13.27	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	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.
Solar Nigeria Programme	1.82	2.34	Committed	ODA	Grant	Adaptation	Energy generation, renewable sources	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.
Rural Electrification in Sierra Leone	11.98	15.41	Committed	ODA	Grant	Mitigation	Energy distribution	"To increase access to clean energy through the creation of environmentally and economically sustainable electric mini-grid systems for small remote rural communities in Sierra Leone by 2020. This is expected to directly benefit around 360,000 people in rural Sierra Leone, and indirectly help up to 1.8 million people access low carbon electricity. This will add more than 10 Mega Watts (MW) to the country's power generation capacity of an estimated average peak demand requirement of 300-500 MW. There will be a welfare increase in rural communities in terms of saved fuel costs, improved health and education outcomes, improved communications and access to information and health and safety. The project will also result in a significant reduction in Sierra Leone's future Green House Gas emissions through supported private investment in the installation and operation of renewably-powered mini-grids'".
Forestry, Land-use and Governance in Indonesia	10.44	13.44	Committed	ODA	Grant	Mitigation	Forestry	To reduce greenhouse gas emissions and deforestation in Indonesia as part of the UK's efforts to avoid catastrophic climate change that would hit the very poorest first and set back global efforts at poverty reduction
Strategic Partnership Arrangement II between DFID and BRAC	10.00	12.87	Committed	ODA	Grant	Adaptation	Basic Education	To provide support to BRAC's development programmes to improve access to quality basic services (health, education, water and sanitation), help the poorest, most marginalised people across the whole of Bangladesh graduate from extreme poverty, support inclusive growth and help build effective formal and informal institutions. Climate finance will be integrated across BRAC's programmes to strengthen the resilience of BRAC's investments and the communities they serve. UK support will include: helping over 950,000 children (600,000 girls) gain a decent education; providing additional nutritional support to 11 million people (7 million women and girls); helping 5.7 million girls and women gain access to family planning services; providing at least 75,000 people with sustainable access to clean water and sanitation; supporting over 80,000 women to better cope with the effects of climate change; and lifting 240,000 women and their families (over 960,000 people) out of extreme poverty.
The Water Security Programme	9.06	11.66	Committed	ODA	Grant	Adaptation	Water Supply & 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, World Bank Water Partnership Programme and GIZ International Water Stewardship Programme to support increased investment in the information, institutions and infrastructure required to deliver water security.
Kenya – Strengthening Regional Economic Integration	5.10	6.56	Committed	ODA	Grant	Mitigation	Transport & Storage	To improve the pace of infrastructure development and enhance regional trade competitiveness, by delivering improvement to the managerial capacity and physical layout for cargo handling at the Port of Mombasa, including climate resilient infrastructure and lower emission transport systems, and improved regulatory framework for trade. This will contribute to increased exports and regional trade in East Africa benefitting the regional population.
Kenya – Strengthening Regional Economic Integration	3.40	4.38	Committed	ODA	Grant	Adaptation	Transport & Storage	To improve the pace of infrastructure development and enhance regional trade competitiveness, by delivering improvement to the managerial capacity and physical layout for cargo handling at the Port of Mombasa, including climate resilient infrastructure and lower emission transport systems, and improved regulatory framework for trade. This will contribute to increased exports and regional trade in East Africa benefitting the regional population.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Multi-Year Humanitarian Programme in Pakistan	8.33	10.73	Committed	ODA	Grant	Adaptation	Emergency Response	Support for up to three million of the most vulnerable people affected by natural disaster and conflict. This will cover both immediate relief and early recovery interventions for shelter, food, non-food items, water and sanitation, livelihood and protection needs, depending on the emergency, including enhancing resilience of the beneficiary communities to climate extremes such as floods and droughts. This programme will also support developments in the UN and local civil society which are required for humanitarian responses to be more locally owned and effective in future, as well as effective monitoring and evaluation, targeted active research and piloting.
Productive Social Safety Net Programme	8.00	10.30	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	To support the scale up of the Productive Social Safety Net which will reach 1 million households, and these households are the poorest 15%. through the provision of conditional Cash Transfers, Green Public Works and Livelihood Enhancement. This programme will aim to improve the opportunities available to the poorest communities by reducing the depth of income poverty, improving food consumption and increasing their resilience to climate-related shocks. DFID will also support central government to develop and strengthen systems and institutions to deliver more comprehensive social protection provision that can respond to any future economic, food or climate shocks in Tanzania
Climate Smart Agriculture in Africa	2.61	3.36	Committed	ODA	Grant	Mitigation	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 Smart Agriculture in Africa	4.85	6.24	Committed	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.
Green Mini-Grids Africa Regional Facility for Market Preparation, Evidence and Policy Development	5.73	7.38	Committed	ODA	Grant	Mitigation	Energy Policy	The Green Mini-Grids programme aims to help transform the mini grid sector from a growing and sporadic series of pilot projects, to a thriving industry. Work includes development of small-scale electricity generation which serves a limited number of consumers via a distribution grid that can operate in isolation from national electricity transmission network. Transformation is to be achieved through the creation of a critical mass of experience and evidence of success in two countries (Kenya and Tanzania), coupled with improved policy and market conditions for investments regionally.
Green Mini-Grids Africa Regional Facility for Market Preparation, Evidence and Policy Development	1.43	1.85	Committed	ODA	Grant	Adaptation	Energy Policy	The Green Mini-Grids programme aims to help transform the mini grid sector from a growing and sporadic series of pilot projects, to a thriving industry. Work includes development of small-scale electricity generation which serves a limited number of consumers via a distribution grid that can operate in isolation from national electricity transmission network. Transformation is to be achieved through the creation of a critical mass of experience and evidence of success in two countries (Kenya and Tanzania), coupled with improved policy and market conditions for investments regionally.
International Forestry Knowledge (KnowFor)	3.47	4.46	Committed	ODA	Grant	Mitigation	Forestry	Uptake of international forestry knowledge, evidence and tools for international forestry policy and practice
International Forestry Knowledge (KnowFor)	3.47	4.46	Committed	ODA	Grant	Adaptation	Forestry	Uptake of international forestry knowledge, evidence and tools for international forestry policy and practice
Pacific Catastrophe Risk Assessment and Financing Initiative	6.68	8.59	Committed	ODA	Grant	Adaptation	Banking & Financial Services	"To provide technical assistance and capital to provide insurance for the Pacific Islands so in future they can protect themselves against natural disasters such as cyclones and Tsunamis thereby reducing their reliance on humanitarian aid. The nations of Tonga, Marshall islands, Cook Islands, Vanuatu, and Samoa (625,000 people in total) will benefit from the insurance at the start of the programme"
South Sudan Humanitarian Programme (HARISS) 2014 – 2020	6.63	8.54	Committed	ODA	Grant	Adaptation	Agriculture	To help approximately three million South Sudanese by providing critical life-saving support and helping people to better cope with shocks from conflict, drought and flooding. This programme aims to save the lives of an estimated two million people who will receive at least one form of humanitarian assistance; and build the capacity of an estimated one million people to recover and cope better with shocks. Over five years this programme will provide food, shelter and access to water and health services to millions of vulnerable people, including women and children.
Water, Environmental Sanitation and Hygiene Programme	6.56	8.44	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	To provide sanitation and hygiene services in Freetown. Establishing and expanding sustainable waste management services in three large towns and improving water, sanitation and hygiene services in rural areas and in two small towns. Includes increasing water security and building resilience to future water scarcity as a result of climate change.
Strengthening Health Facilities in the Caribbean	0.32	0.41	Committed	ODA	Grant	Mitigation	Health, General	To provide safer, greener health facilities in Belize, Dominica, Grenada, Guyana, Jamaica, St Lucia and Saint Vincent and the Grenadines to deliver care in disasters, generate operational savings and reduce disaster losses.
Strengthening Health Facilities in the Caribbean	6.08	7.82	Committed	ODA	Grant	Adaptation	Health, General	To provide safer, greener health facilities in Belize, Dominica, Grenada, Guyana, Jamaica, St Lucia and Saint Vincent and the Grenadines to deliver care in disasters, generate operational savings and reduce disaster losses.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Climate Proofing Growth and Development in South Asia	6.29	8.09	Committed	ODA	Grant	Adaptation	Government & Civil Society	Integrate climate change into development planning, budgeting and delivery in national and sub-national governments in Afghanistan, India, Nepal and Pakistan.This will done by strengthening planning, budgeting, delivery mechanisms, building awareness and capacity of stakeholders through technical and some implementation support. It will help to mobilise domestic and International finance. Sharing lesssons and knowledge in South Asia is a key element of the project.
Investments in Forests and Sustainable Land Use	3.02	3.88	Committed	ODA	Grant	Mitigation	Forestry	To support public-private partnerships that demonstrate how companies, communities, smallholders and governments can work collaboratively to reduce deforestation and benefit forest dependent communities
Investments in Forests and Sustainable Land Use	3.02	3.88	Committed	ODA	Grant	Adaptation	Forestry	To support public-private partnerships that demonstrate how companies, communities, smallholders and governments can work collaboratively to reduce deforestation and benefit forest dependent communities
Climate Action for Middle East and North Africa (CAMENA)	1.50	1.93	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	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 Action for Middle East and North Africa (CAMENA)	4.50	5.79	Committed	ODA	Grant	Adaptation	Energy generation, renewable sources	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.
Rehabilitation of Freetown's Water Supply System	5.98	7.70	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	The project will increase sustainable access to safe water in Freetown, the capital city, and safe-guard water security and reduce climate change vulnerability. This will be achieved through rehabilitation of water infrastructure for improved public service delivery of water.
Provision of finance to the Rwanda Fund for Climate Change and Environment	1.47	1.90	Committed	ODA	Grant	Mitigation	Agriculture	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. This will benefit 15 000 people to cope better with climate change impacts, 2000 people gain access to clean energy especially in rural areas, protect 1200 hectares of land against soil erosion, create 2000 green jobs as well as mobilise £8 million of additional finance from the private sector by July 2015. This contributes towards the MDG on environmental sustainability and ensuring an effective response to the impacts of climate change, thus securing current and future development gains as well as protection of the livelihoods of the poorest people.
Provision of finance to the Rwanda Fund for Climate Change and Environment	4.42	5.69	Committed	ODA	Grant	Adaptation	Agriculture	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. This will benefit 15 000 people to cope better with climate change impacts, 2000 people gain access to clean energy especially in rural areas, protect 1200 hectares of land against soil erosion, create 2000 green jobs as well as mobilise £8 million of additional finance from the private sector by July 2015. This contributes towards the MDG on environmental sustainability and ensuring an effective response to the impacts of climate change, thus securing current and future development gains as well as protection of the livelihoods of the poorest people.
Multi-Year Humanitarian Support to Afghanistan	0.58	0.74	Committed	ODA	Grant	Mitigation	Disaster Prevention & Preparedness	To provide support to the most vulnerable groups in Afghanistan to have access to timely, appropriate and cost-effective humanitarian aid, have fewer life-critical needs, build the capacity of communities to mitigate the risk of natural disasters, including climate risk mitigation, and to better respond to these events when they occur.
Multi-Year Humanitarian Support to Afghanistan	5.19	6.67	Committed	ODA	Grant	Adaptation	Disaster Prevention & Preparedness	To provide support to the most vulnerable groups in Afghanistan to have access to timely, appropriate and cost-effective humanitarian aid, have fewer life-critical needs, build the capacity of communities to mitigate the risk of natural disasters, including climate risk mitigation, and to better respond to these events when they occur.
Kenya Market Assistance Programme (MAP)	1.38	1.78	Committed	ODA	Grant	Mitigation	Agriculture	To reduce poverty in Kenya by enabling poor people to benefit from better functioning markets, including through mainstreaming climate resilience into market interventions, and by building greater awareness among influential decision makers of how markets can work better for the poor. This will increase household incomes of 148,000 small scale farmers and entrepreneurs – of whom 33% are women – by an average of over 20% by 2018. 36,000 jobs for women and 73,000 for men and male youth will also be created.
Kenya Market Assistance Programme (MAP)	4.14	5.33	Committed	ODA	Grant	Adaptation	Agriculture	To reduce poverty in Kenya by enabling poor people to benefit from better functioning markets, including through mainstreaming climate resilience into market interventions, and by building greater awareness among influential decision makers of how markets can work better for the poor. This will increase household incomes of 148,000 small scale farmers and entrepreneurs – of whom 33% are women – by an average of over 20% by 2018. 36,000 jobs for women and 73,000 for men and male youth will also be created.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
On and off Grid Small Scale Renewable Energy in Uganda	5.50	7.08	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	To improve the environment for private investment in Uganda's renewable energy sector by accelerating the market for off grid solar energy and supporting the construction of at least 15 on-grid small scale power plants. This will increase Uganda's energy production by approximately 20%, improve access to clean and modern energy for over 200,000 households and businesses or 1.2m people; mobilise up to £240 million in 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 MtCO2e.
Post-Earthquake Reconstruction in Nepal – Building Back Better	5.39	6.94	Committed	ODA	Grant	Adaptation	Reconstruction Relief & Rehabilitation	Establish partnerships with local & central government, communities and businesses to support the (i) districts effected by the Earthquake to "build back better" including leading to more resilient (including climate resilient) infrastructure and institutions; (ii) the most vulnerable recover their livelihoods and assets; and (iii) the Government of Nepal to plan for and manage the response to the earthquake.
Northern Uganda: Transforming the Economy through Climate Smart Agribusiness (NU-TEC)	0.52	0.67	Committed	ODA	Grant	Mitigation	Agriculture	To increase the resilience to climate change of poor farmers in Northern Uganda, and to increase their incomes. This will be achieved by working with agricultural businesses to supply farmers with cheaper, better and more varied agricultural inputs and services, and to create stronger markets for farmer produce. This will benefit 250,000 households in Northern Uganda, who will adopt new practices, products and markets that will make them more resilient to climate change, while 150,000 households will see measurable increases to income. This will contribute to the MDGs (and their successor targets) by reducing poverty in Uganda.
Northern Uganda: Transforming the Economy through Climate Smart Agribusiness (NU-TEC)	4.70	6.04	Committed	ODA	Grant	Adaptation	Agriculture	To increase the resilience to climate change of poor farmers in Northern Uganda, and to increase their incomes. This will be achieved by working with agricultural businesses to supply farmers with cheaper, better and more varied agricultural inputs and services, and to create stronger markets for farmer produce. This will benefit 250,000 households in Northern Uganda, who will adopt new practices, products and markets that will make them more resilient to climate change, while 150,000 households will see measurable increases to income. This will contribute to the MDGs (and their successor targets) by reducing poverty in Uganda.
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	2.24	2.88	Committed	ODA	Grant	Mitigation	Industry	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). Enabling this change will require targeted support to critical aspects of climate change governance, and stimulation of civil society demand. This contributes to the UK Government's International Climate Fund (ICF) commitments and will benefit 828,000 people able to cope with the effects of climate change and 17,600 people with improved access to clean energy.
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	2.74	3.52	Committed	ODA	Grant	Adaptation	Industry	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). Enabling this change will require targeted support to critical aspects of climate change governance, and stimulation of civil society demand. This contributes to the UK Government's International Climate Fund (ICF) commitments and will benefit 828,000 people able to cope with the effects of climate change and 17,600 people with improved access to clean energy.
Climate and Development Knowledge Network	2.52	3.24	Committed	ODA	Grant	Mitigation	General Environment Protection	To improve access for developing countries to high quality research and information in designing climate change policies and programmes by 2015 (funded by Climate and Environment Dept).
Climate and Development Knowledge Network	2.32	2.99	Committed	ODA	Grant	Adaptation	General Environment Protection	To improve access for developing countries to high quality research and information in designing climate change policies and programmes by 2015 (funded by Climate and Environment Dept).
Sustainable Energy for Women and Girls (SEWG)	3.35	4.31	Committed	ODA	Grant	Mitigation	Energy Policy	Programme aims to shift clean energy markets and delivery systems towards improving the health, safety and economic opportunities of low income girls and women in developing countries, principally in DFID and International Climate Fund (ICF) priority countries in Africa.
Sustainable Energy for Women and Girls (SEWG)	1.43	1.85	Committed	ODA	Grant	Adaptation	Energy Policy	Programme aims to shift clean energy markets and delivery systems towards improving the health, safety and economic opportunities of low income girls and women in developing countries, principally in DFID and International Climate Fund (ICF) priority countries in Africa.
UK Caribbean Infrastructure Fund	0.51	0.65	Committed	ODA	Grant	Mitigation	Transport & Storage	As announced by the UK government in September 2015, the UK Caribbean Infrastructure Fund will create critical economic infrastructure including: bridges; renewable energy; ports; water; and sea defences that will increase productivity and resilience to natural disasters and climate change. This fund aims to improve economic development in 8 ODA eligible and 1 ODA eligible Overseas Territory by helping to boost growth and creating jobs across the region.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
UK Caribbean Infrastructure Fund	4.09	5.27	Committed	ODA	Grant	Adaptation	Transport & Storage	As announced by the UK government in September 2015, the UK Caribbean Infrastructure Fund will create critical economic infrastructure including: bridges; renewable energy; ports; water; and sea defences that will increase productivity and resilience to natural disasters and climate change. This fund aims to improve economic development in 8 ODA eligible and 1 ODA eligible Overseas Territory by helping to boost growth and creating jobs across the region.
Promoting Conservation Agriculture in Zambia	1.31	1.69	Committed	ODA	Grant	Mitigation	Agriculture	To raise agricultural productivity in Zambia, particularly small scale farmers, using climate smart agriculture techniques and facilitating commercial relationships with agriculture companies
Promoting Conservation Agriculture in Zambia	3.06	3.94	Committed	ODA	Grant	Adaptation	Agriculture	To raise agricultural productivity in Zambia, particularly small scale farmers, using climate smart agriculture techniques and facilitating commercial relationships with agriculture companies
Climate and Development Knowledge Network	2.25	2.89	Committed	ODA	Grant	Mitigation	General Environment Protection	To improve access for developing countries to high quality research and information in designing climate change policies and programmes by 2015 (funded by Research Dept).
Climate and Development Knowledge Network	2.07	2.67	Committed	ODA	Grant	Adaptation	General Environment Protection	To improve access for developing countries to high quality research and information in designing climate change policies and programmes by 2015 (funded by Research Dept).
Support to improved water and sanitation in rural areas – Zimbabwe	0.85	1.10	Committed	ODA	Grant	Mitigation	Water Supply & Sanitation	Contribute to the reduction of morbidity and mortality due to water, sanitation and hygiene related diseases. To reduce burden of water collection on women and girls; to improve basic education and gender equality. The programme target areas where effects of climate change and variability such as droughts and floods have affected community access to safe drinking water. Specifically, the programme is (i) Increasing the number of water sources in affected areas through rehabilitating and drilling high yielding and perennial water sources, (ii) Installing more energy efficient and clean solar powered Piped water systems with water storage facilities to ensure constant water supply and efficient water demand management during periods of water stress, (iii) Promoting water conservation through constructing waste water collection troughs at water points for livestock and (iv) Working with district water and sanitation technicians to construct climate resilient infrastructure.
Support to improved water and sanitation in rural areas – Zimbabwe	3.41	4.39	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	Contribute to the reduction of morbidity and mortality due to water, sanitation and hygiene related diseases. To reduce burden of water collection on women and girls; to improve basic education and gender equality. The programme target areas where effects of climate change and variability such as droughts and floods have affected community access to safe drinking water. Specifically, the programme is (i) Increasing the number of water sources in affected areas through rehabilitating and drilling high yielding and perennial water sources, (ii) Installing more energy efficient and clean solar powered Piped water systems with water storage facilities to ensure constant water supply and efficient water demand management during periods of water stress, (iii) Promoting water conservation through constructing waste water collection troughs at water points for livestock and (iv) Working with district water and sanitation technicians to construct climate resilient infrastructure.
Rural Access Programme 3	4.23	5.44	Committed	ODA	Grant	Adaptation	Transport & Storage	To improve road access for 800,000 members of rural communities in the Western Region of Nepal, thereby improving economic opportunities and increasing access to markets and social services throughout the year. The project will lift 20,000 people out of poverty through access to work, skill trainings, and will promote equal opportunities for women. The project aims to contribute towards sustainable poverty reduction through investments in high value crops and will lay the foundations for private sector led development in the poorest region in the country. Climate variability and climate change are integrated in building new roads and maintaining existing roads through the programme.
Improving Rural Access in Tanzania	4.00	5.15	Committed	ODA	Grant	Adaptation	Transport & Storage	To provide support to the local government infrastructure development by improving access to markets by reducing transport costs. This includes building more climate resilient structures to restore access for vulnerable communities, cut off by extreme weather events, and the development of National Guidelines for climate resilient rural roads and structures. This will lead to an increase in rural income to 45,000 households by 2015. This contributes towards MDG by providing agricultural growth and underpinning strong economic development in Tanzania.
Improving Livelihoods and Land Use in Congo Basin Forests	1.97	2.54	Committed	ODA	Grant	Mitigation	Forestry	To improve the the livelihoods of forest dependent communities and reduce deforestation in the Congo Basin by providing support to forest zoning, independent forest monitoring, civil society advocacy and the strengthening of legal frameworks for community forestry, as well as direct investments in community forest enterprises. The programme is expected to benefit 2.4million beneficiaries (direct and indirect). The programme will also have a demonstration effect, building a body of evidence on Community Forestry in the Congo Basin.

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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*	
	Domestic currency (£m)	*USD ($m)*						
Improving Livelihoods and Land Use in Congo Basin Forests	1.97	2.54	Committed	ODA	Grant	Adaptation	Forestry	To improve the the livelihoods of forest dependent communities and reduce deforestation in the Congo Basin by providing support to forest zoning, independent forest monitoring, civil society advocacy and the strengthening of legal frameworks for community forestry, as well as direct investments in community forest enterprises. The programme is expected to benefit 2.4million beneficiaries (direct and indirect). The programme will also have a demonstration effect, building a body of evidence on Community Forestry in the Congo Basin.
Enhancing Community Resilience Programme	0.38	0.48	Committed	ODA	Grant	Mitigation	Agriculture	To achieve sustainable disaster-resilient communities through community-based best practices, public awareness and policy change.
Enhancing Community Resilience Programme	3.38	4.35	Committed	ODA	Grant	Adaptation	Agriculture	To achieve sustainable disaster-resilient communities through community-based best practices, public awareness and policy change.
Transboundary Water Management in Southern Africa	3.71	4.78	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	The project will support countries in Southern Africa to manage their shared water resources, thereby helping 2-3 million poor people to better cope with the impacts of existing climate variability and climate change (especially floods and drought). It will do this by improving assessment and planning concerning these resources, and designing and building water infrastructure such as irrigation schemes, water supply or hydropower schemes. This will help poor and vulnerable people gain access to clean and safe water, produce a predictable agricultural yield and store water for when it is needed during the dry months of the year. The programme will also help countries to communicate hydrological data between themselves – thus providing downstream countries with advance notice of floods and enabling countries to optimise how much water is stored in each country to ensure each has enough to meet their basic requirements.
Zimbabwe Resilience Building Fund Programme(ZRBF)	0.70	0.90	Committed	ODA	Grant	Mitigation	General Environment Protection	To improve the resilience capacity of households affected by climatic shocks and trends through inclusive economic development. The programme will have a risk financing mechanism to make timely, appropriate and predictable funding available for communities that experience large scale humanitarian shocks. The program will also build evidence to improve the policy environment and stimulate service provision to enhance household and community resilience.
Zimbabwe Resilience Building Fund Programme(ZRBF)	2.80	3.60	Committed	ODA	Grant	Adaptation	General Environment Protection	To improve the resilience capacity of households affected by climatic shocks and trends through inclusive economic development. The programme will have a risk financing mechanism to make timely, appropriate and predictable funding available for communities that experience large scale humanitarian shocks. The program will also build evidence to improve the policy environment and stimulate service provision to enhance household and community resilience.
Nepal Climate Change Support Programme	3.49	4.49	Committed	ODA	Grant	Adaptation	Government & Civil Society	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.
Building Disaster Resilience in Pakistan	3.43	4.42	Committed	ODA	Grant	Adaptation	Emergency Response	DFID support will strengthen community and household resilience to emergencies and disasters over six years. The programme will aim to build resilience in communities and households in Pakistan to manage the impact of disasters by maintaining or transforming living standards in the face of shocks and stresses without compromising their long-term prospects.
Energy Security and Resource Efficiency in Somaliland	0.68	0.87	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	To support Somaliland in diversifying its energy mix, enhancing resilience and facilitating an enabling institutional and regulatory environment for the expansion of access to electricity.
Energy Security and Resource Efficiency in Somaliland	2.72	3.50	Committed	ODA	Grant	Adaptation	Energy generation, renewable sources	To support Somaliland in diversifying its energy mix, enhancing resilience and facilitating an enabling institutional and regulatory environment for the expansion of access to electricity.
Building Resilience Through Asset Creation and Enhancement II – South Sudan (ICF Programme)	3.38	4.35	Committed	ODA	Grant	Adaptation	Agriculture	To reduce hunger gaps, improve long-term food security and mitigate conflict among 400,000 rural poor in five states of South Sudan. By working together beneficiaries earn food or cash in return for identifying and building community assets (such as irrigation ponds). This enables communities to develop and manage their resources against extreme climate damage and shocks. This will contribute to Sustainable Development Goals 1, 2, 13, 15 and 16 to end poverty and hunger; take action on climate; protect life on land and; promote peaceful and inclusive societies for sustainable development.
Infrastructure for Climate Resilient Growth in India	3.31	4.26	Committed	ODA	Grant	Adaptation	Rural development	In line with the UK government's aid policy and revised development partnership with India, the Infrastructure for Climate Resilient Growth (ICRG) programme sees the UK provide world class expertise to improve the impact of the Indian Government's $5 billion per year National Rural Employment Guarantee Scheme. The scheme will help over 5 million people living in three of India's poorest states – Odisha, Chhattisgarh and Bihar – to increase their incomes and resilience to climate shocks. It guarantees 40 million households per year the opportunity to build small scale works (irrigation, flood defences, forest plantations etc.) to increase their incomes and protect themselves from extreme weather events. UK support will improve the design and quality of infrastructure built, increase the capacity of the government to deliver its own programmes and influence the policies of the largest programme of this type in the world.

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Supporting Structural Reform in the Indian Power Sector	3.11	4.01	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	In line with the UK government's aid policy and new development partnership with India, the 'Supporting Structural Reform in the Indian Power Sector' programme will improve the efficiency, reliability and sustainability of electricity supply in India through technical expertise, not through traditional grant support. It will provide world class expertise to support the market reforms and scale up of renewable energy supply that the Indian power sector needs to support growth and create jobs. It will work at the Central level and in upto three States which may include DFID focus states such as Odisha, Andhra Pradesh and Madhya Pradesh.
Building Urban Resilience to Climate Change in Tanzania	3.04	3.91	Committed	ODA	Grant	Adaptation	Urban development and management	To build urban resilience to current climate variability and future climate change in Tanzania's cities and towns through improved data and evidence, urban planning, and infrastructure provision for sustainable economic growth and development.
Support for Protection and Assistance of Refugees in Kenya (SPARK)	3.03	3.90	Committed	ODA	Grant	Mitigation	Emergency Response	To improve the efficiency in delivery of basic services to refugees (including developing or rehabilitating climate-smart camp infrastructure) and to strengthen their resilience and that of the communities hosting them. This will be achieved through targeted assistance and greater use of cash-based assistance. This programme will assist adolescent girls and women of reproductive age and malnourished children under 5 years of age through nutritional interventions as well as ensuring that the survivors of sexual and gender based violence (SGBV) receive appropriate medical care in a timely manner. The project will also assist 8,000 refugees with livelihoods opportunities , including climate smart opportunities such as processing solid waste for onselling or producing energy-efficient stoves, and will support the voluntarily return of refugees to their countries of origin.
WISER – Weather and climate Information and SERvices for Africa	0.60	0.77	Committed	ODA	Grant	Mitigation	Disaster Prevention & Preparedness	WISER will help at least 24 million people across Africa (focusing initially on East Africa (Ethiopia, Kenya, Tanzania, Uganda, Rwanda and Burundi) to be more resilient to natural disasters and climate change by 2030 by improving early warning systems (giving more time to prepare for heavy rains for example) as well as helping them make better decisions by knowing what the weather and climate is likely to be (enabling them to make better crop choices or alter planting times in farming, for example). We estimate that this will save over £190 million in terms of avoided damage to health, homes, livelihoods and infrastructure between now and 2030. The WISER programme will initially benefit the East African fishing and farming communities, as well as a wide range of African people, including young, old, men and boys and women and girls.
WISER – Weather and climate Information and SERvices for Africa	2.40	3.09	Committed	ODA	Grant	Adaptation	Disaster Prevention & Preparedness	WISER will help at least 24 million people across Africa (focusing initially on East Africa (Ethiopia, Kenya, Tanzania, Uganda, Rwanda and Burundi) to be more resilient to natural disasters and climate change by 2030 by improving early warning systems (giving more time to prepare for heavy rains for example) as well as helping them make better decisions by knowing what the weather and climate is likely to be (enabling them to make better crop choices or alter planting times in farming, for example). We estimate that this will save over £190 million in terms of avoided damage to health, homes, livelihoods and infrastructure between now and 2030. The WISER programme will initially benefit the East African fishing and farming communities, as well as a wide range of African people, including young, old, men and boys and women and girls.
Malawi Health Sector Support Programme	2.97	3.82	Committed	ODA	Grant	Mitigation	Health, General	To improve utilisation of quality, effective essential health services especially by the poor, and deliver the following outputs through an Essential Health Package: 4.3 million children underfive treated for pneumonia; 63,000 patients treated for TB; 2.3 million deliveries by skilled health workers; 363,000 additional family planning users; 416,000 adults on HIV treatment in 2015; 2.4 million children fully immunised; 25 million children treated for malaria and 10 million bednets distributed. Some unreliable and costly energy supplies will be replaced by solar power.
Renewable Energy and Adaptation Climate Technologies (Africa Enterprise Challenge Fund)	1.45	1.86	Committed	ODA	Grant	Mitigation	Energy distribution	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. Every business supported by REACT must demonstrate a positive impact on the rural poor through increased incomes, employment and productivity or by reducing costs.
Renewable Energy and Adaptation Climate Technologies (Africa Enterprise Challenge Fund)	1.45	1.86	Committed	ODA	Grant	Adaptation	Energy distribution	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. Every business supported by REACT must demonstrate a positive impact on the rural poor through increased incomes, employment and productivity or by reducing costs.
Disaster Risk Insurance	2.87	3.69	Committed	ODA	Loan/Equity	Adaptation	Banking & Financial Services	To improve the resilience of the private sector in poor countries to natural disasters by improving access to insurance products. By supporting the development of a market for private sector disaster risk insurance in developing countries, the project will sustainably help strengthen resilience, mitigate the effects of climate change and supporting economic development through private sector growth.

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Southern Agriculture Growth Corridor Programme in Tanzania	2.80	3.61	Committed	ODA	Grant	Adaptation	Transport & Storage	To raise rural incomes and increase food security by contributing to the improvements in the business environment for commercial agriculture in Tanzania (especially the southern corridor), as well as growth in number and scale of commercial agribusinesses and substantial improvement in the market operations of a number of agricultural commodity markets. This includes ensuring infrastructure is climate resilient, such as no weather-related road closures. The programme is expected to benefit 100,000 rural households by March 2015 and over 230,000 households by end of the Programme in 2017
Social Protection Support to the Poorest in Rwanda	2.75	3.54	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	To increase the coverage of social protection and to strengthen social protection systems for the poorest by providing financial aid to the Rwanda Local Development Support Fund (RLDSF) and technical assistance to RLDSF and the Ministry of Local Government. This will benefit an additional 55,000 poor households (approximately 217,680 individuals) each year with social cash transfers, helping them to meet their basic needs and to better manage risks such as natural disasters e.g. floods and landslides which will be exacerbated by climate change.
Nepal Local Governance Support Programme	2.71	3.49	Committed	ODA	Grant	Adaptation	Government & Civil Society	To improve governance and services at the local level in Nepal, benefitting 2 million households. This includes introducing simple anti-corruption measures (e.g. public audits) and providing the poorest and most excluded with tools to build their confidence to voice demands and hold officials to account. Parts of the programme will also ensure that Local Government's awareness and capacity on climate change adaptation, disaster resilience and environmentally friendly governance is improved.
Adapt Environmental and Climate Resilience in Sudan	2.70	3.47	Committed	ODA	Grant	Adaptation	General Environment Protection	To increase understanding and integration of climate resilience and environmental management into delivery, plans and policy in Sudan. 100% ICF Funding
South Asia Water Governance Programme (SAWGP)	2.68	3.46	Committed	ODA	Grant	Adaptation	Water Supply & 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
Assisting Public Institutions and Markets to Become Resilient to Effects of Climate Change in Tanzania (AIM for Resilience)	0.13	0.17	Committed	ODA	Grant	Mitigation	Government & Civil Society	To enable the poorest and most vulnerable in Tanzanian society to become more resilient to climate change and to benefit from low carbon growth through the strengthening of the United Republic of Tanzania Public sector institutions to implement the national climate change strategy and adaptation plans. The programme will also support relevant sector Ministries to implement their sector resilience plans; support to building the capacity of the Tanzania Meteorological Agency to provide meteorological data management and providing efficient services to its customers; and seek to develop sustainable private sector markets. This programme is a central element of the UK International Climate Fund portfolio in Tanzania and will help maximise the return from the wider investments.
Assisting Public Institutions and Markets to Become Resilient to Effects of Climate Change in Tanzania (AIM for Resilience)	2.50	3.22	Committed	ODA	Grant	Adaptation	Government & Civil Society	To enable the poorest and most vulnerable in Tanzanian society to become more resilient to climate change and to benefit from low carbon growth through the strengthening of the United Republic of Tanzania Public sector institutions to implement the national climate change strategy and adaptation plans. The programme will also support relevant sector Ministries to implement their sector resilience plans; support to building the capacity of the Tanzania Meteorological Agency to provide meteorological data management and providing efficient services to its customers; and seek to develop sustainable private sector markets. This programme is a central element of the UK International Climate Fund portfolio in Tanzania and will help maximise the return from the wider investments.
Providing Clean Energy to the Rural Poor of Bangladesh	2.59	3.33	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	Climate change mitigation and access to clean energy to improve the livelihoods of rural poor in off- grid areas in Bangladesh
I2I – Ideas to Impact – Testing new technologies and innovative approaches to address development challenges.	1.39	1.79	Committed	ODA	Grant	Mitigation	Industry	I2I stimulates technological innovations addressing intractable development challenges, initially in the focal areas of energy, water and climate, and then increasingly in emerging "frontier" technologies with broader applicability. It tests different funding mechanisms and approaches – including prizes, peer-to-peer financing, Frontier Technology Livestreaming, and innovative cross-government partnerships – for ensuring technology ideas lead to a real-world development impact.
I2I – Ideas to Impact – Testing new technologies and innovative approaches to address development challenges.	1.14	1.46	Committed	ODA	Grant	Adaptation	Industry	I2I stimulates technological innovations addressing intractable development challenges, initially in the focal areas of energy, water and climate, and then increasingly in emerging "frontier" technologies with broader applicability. It tests different funding mechanisms and approaches – including prizes, peer-to-peer financing, Frontier Technology Livestreaming, and innovative cross-government partnerships – for ensuring technology ideas lead to a real-world development impact.

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Corridors for Growth	0.79	1.02	Committed	ODA	Grant	Mitigation	Transport & Storage	To increase Tanzania's infrastructure for trade in three ways (i) Co-financing the Dar Port expansion together with the World Bank and Tanzania Port Authority will double port capacity and enable Tanzania's entire trade volume to increase by two thirds. (ii) Project preparation funding for six more major regional transport projects are expected to catalyse up to £600m of development finance incorporating climate resilent design. (iii) Launching a new approach to Public-Private Partnerships will improve infrastructure in municipal areas and build capacity for larger PPP's in the future.The programme is expected to reduce the costs of doing business in Tanzania, contributing to growth, more jobs and lower poverty. The short-term beneficiaries will be users such as traders, logistics providers and public citizens. International business including from the UK will benefit from better access to trade.In the medium to long run employment is expected to increase from indirect effects.
Corridors for Growth	1.61	2.07	Committed	ODA	Grant	Adaptation	Transport & Storage	To increase Tanzania's infrastructure for trade in three ways (i) Co-financing the Dar Port expansion together with the World Bank and Tanzania Port Authority will double port capacity and enable Tanzania's entire trade volume to increase by two thirds. (ii) Project preparation funding for six more major regional transport projects are expected to catalyse up to £600m of development finance incorporating climate resilent design. (iii) Launching a new approach to Public-Private Partnerships will improve infrastructure in municipal areas and build capacity for larger PPP's in the future.The programme is expected to reduce the costs of doing business in Tanzania, contributing to growth, more jobs and lower poverty. The short-term beneficiaries will be users such as traders, logistics providers and public citizens. International business including from the UK will benefit from better access to trade.In the medium to long run employment is expected to increase from indirect effects.
Strengthening humanitarian preparedness and response in Bangladesh	2.37	3.05	Committed	ODA	Grant	Adaptation	Emergency Response	This programme will deliver improvement in disaster preparedness and response for large-scale catastrophic emergencies (e.g. earthquakes and cyclones) and recurrent, predictable events such as flooding as well as providing predictable support to Rohingya refugees and vulnerable refugee hosting communities.
African Risk Capacity (ARC)	2.32	2.99	Committed	ODA	Grant	Adaptation	Disaster Prevention & Preparedness	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.
Climate Public Private Partnership Programme (CP3)	2.17	2.80	Committed	ODA	Grant	Mitigation	Banking & Financial Services	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 as pension funds and sovereign wealth funds into these areas by creating two commercial private equity funds of funds which will invest in subfunds and projects in developing countries, creating track records of investment performance which should in turn encourage further investments and accelerate the growth of investment in climate.
Regional Transboundary Water Resources Programme – Phase 3	0.21	0.27	Committed	ODA	Grant	Mitigation	Water Supply & 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. These outcomes will contribute to MDG 1 ("Eradicate Extreme Poverty and Hunger") and MDG7 ("Ensure Environmental Sustainability").
Regional Transboundary Water Resources Programme – Phase 3	1.92	2.47	Committed	ODA	Grant	Adaptation	Water Supply & 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. These outcomes will contribute to MDG 1 ("Eradicate Extreme Poverty and Hunger") and MDG7 ("Ensure Environmental Sustainability").
East Africa Geothermal Energy (EA-Geo)	1.89	2.43	Committed	ODA	Grant	Mitigation	Energy Policy	The programme aims to increase investment in geothermal energy in East Africa, contributing to economic development and growth, by addressing market failures which hinder the very early stages of geothermal market development, including: • reducing the risk of exploratory test drilling, leading to increased investor confidence in under exploited East Africa geothermal energy; and, • improving geothermal strategy, policy and regulations that facilitate investment."
Green Mini-Grids Kenya	2.00	2.58	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	Support for project preparation and leveraging of private investment in Green Mini-Grids (GMGs) in Kenya
Global Network of Climate Technology Innovation Centres	1.00	1.29	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	The purpose is to build a global community of practice of entrepreneurs and innovators dedicated to develop and deploy climate smart technologies providing clean, safe, reliable and sustainable access to energy, water and other natural resources to poor communities in developing countries

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	Domestic currency (£m)	*USD ($m)*						
Global Network of Climate Technology Innovation Centres	1.00	1.29	Committed	ODA	Grant	Adaptation	Energy generation, renewable sources	The purpose is to build a global community of practice of entrepreneurs and innovators dedicated to develop and deploy climate smart technologies providing clean, safe, reliable and sustainable access to energy, water and other natural resources to poor communities in developing countries
Cities and Infrastructure for Growth (CIG)	2.00	2.57	Committed	ODA	Grant	Mitigation	Energy Policy	The UK will provide up to £165m over 5 years in two phases of £82.5m. The programme will provide technical support on city and regional interventions in 3 focus countries, Burma, Uganda and Zambia resulting in increased inclusive economic growth and job creation. The interventions will help city economies to become more productive, deliver access to reliable, affordable, renewable power for businesses and households, and strengthen investment into infrastructure services, including from the UK.
Water for Three States (Red Sea, Gadarif and Kassala)	1.95	2.51	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	To provide the people of Eastern Sudan with access to sustainable clean drinking water sources, improved sanitation facilities, and hygiene promotion by 2018. This will be achieved by implementing water and sanitation projects in selected rural areas of Gadaref, Kassala and Red Sea States and by designing a comprehensive and feasible plan for rehabilitation and expansion of Port Sudan water and sanitation systems. The programme contributes to the seventh Millennium Development Goal that is to ensure environmental sustainability by reducing the proportion of people without sustainable access to safe drinking water and basic sanitation. 40% ICF funding.
Humanitarian Innovation and Evidence Programme: greater use of evidence and innovation in humanitarian responses	1.72	2.22	Committed	ODA	Grant	Mitigation	Research/scientific institutions	This is business case 2/3 which implements the DFID Humanitarian Innovation and Evidence Strategy. This programme will develop and test innovative approaches to humanitarian practice; provide evidence of the cost effectiveness of investments in disaster risk reduction; provide new evidence on the scaling up of cash-based approaches; support better evidence on insurance as a risk management tool; and create new evidence on the best intervention to improve health and nutrition in emergencies.This is one of three business cases which implements the DFID Humanitarian Innovation and Evidence Strategy. Between 2000-2009, more than 2.2 billion people were affected by 4,484 natural disasters. Vulnerability to hazards is increasing as a result of demographic, political and environmental changes. Demand for humanitarian assistance is likely to rise while economic constraints are also increasing. In this context it is important to ensure that the most effective and cost efficient approch
Punjab Education Support Programme II	1.64	2.11	Committed	ODA	Grant	Mitigation	Basic Education	To improve access, retention and the quality of education for all children in primary and secondary schools of Punjab Province in Pakistan. All government school children (6 million primary, 4 million secondary) and children attending school through the Punjab Education Foundation (around 2.2 million) will have benefited from UK support in Punjab by March 2019. Buildings will be sited and constructed in environmentally sound and climate resilient ways (such as to build resilient to floods), testing new approaches including using climate-friendly local materials.
Direct Response through Emergency Cash Transfers	1.56	2.00	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	To provide financial grants to food insecure households with children under the age of two that are affected by effects of climate change so as to enable them access basic services (food, water, clothing) to cushion the impact until 2018
Climatescope – Clean Energy Investment Index	1.47	1.89	Committed	ODA	Grant	Mitigation	Energy Policy	To increase private investment in renewable energy projects in developing countries by providing investors with comparable and robust policy and market information in an easilyaccesible data tool. Renewable energy is becoming a cheaper solution than fossil fuels in many developing countries and by providing better information to potential investors, Climatescope supports increasing investment in renewable energy in developing countries. This in turn will support economic growth through greater access to sustainable energy and allow businesses to prosper.
African Agriculture Technology Foundation (AATF) Phase III (2015-2020)	1.45	1.87	Committed	ODA	Grant	Adaptation	Agriculture	"The expected impact of support to the proposed intervention is increased productivity of small-holder farmers in Sub-Saharan Africa, including scaling up of crops resilient to climate shocks such as drought. This impact will be achieved through two outcomes a. Increased access/availability of appropriate agricultural technologies for small-holder farmers in targeted countries in Sub-Saharan Africa. b.A financially sustainable organisation/mechanism that is responsive to the needs of small-holder farmers in ensuring that market failures in the development and adoption of appropriate agricultural technologies continue to be addressed."
Transparency and Right to Information	1.41	1.81	Committed	ODA	Grant	Adaptation	Government & Civil Society	To increase transparency and accountability in Bangladesh by improving systems for management and proactive publication of official information that is relevant and accessible, timely and accurate, and by enabling state reformers, businesses and social activists to hold officials and decision makers answerable for their actions across a range of services including health, education, local government, climate finance and land administration

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	Domestic currency (£m)	*USD ($m)*						
Programme of Support to Agriculture in Rwanda	0.13	0.17	Committed	ODA	Grant	Mitigation	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. The programme will build resilience to climate variability and improve sustainable management of agricultural land by increasing soil erosion control, small scale irrigation and strengthening sustainability and resilience strategies. The programme will result in increased agricultural productivity, food security and incomes of poor households and contributes towards the MDG's by helping to eradicate extreme poverty and hunger and; promoting gender equality and empowering women.
Programme of Support to Agriculture in Rwanda	1.21	1.55	Committed	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. The programme will build resilience to climate variability and improve sustainable management of agricultural land by increasing soil erosion control, small scale irrigation and strengthening sustainability and resilience strategies. The programme will result in increased agricultural productivity, food security and incomes of poor households and contributes towards the MDG's by helping to eradicate extreme poverty and hunger and; promoting gender equality and empowering women.
Accelerating Investment and Infrastructure in Nepal	1.24	1.60	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	To accelerate private investment and economic growth in Nepal by providing technical expertise to help Nepalese institutions develop major infrastructure (including renewable energy); improve the business climate for domestic and foreign investors; improve the implementation of economic policy and test new approaches for local economic development. This will result in at least £600 million of private investment into growth-boosting sectors and a reduction by at least 10% in time or cost for at least five regulatory processes perceived as burdensome by the private sector.
Research Programme Consortium on Leveraging Agriculture for Nutrition in South Asia (LANSA)	1.14	1.46	Committed	ODA	Grant	Adaptation	Health, General	"The purpose of this research programme is to answer the question "how can South Asian agriculture and related food security policies and interventions best be designed and implemented to increase their impacts on nutrition, especially the nutrition status of children and adolescent girls"? This programme will contribute to the acceleration in reductions in poverty and under nutrition of women and children by generating a body of high quality evidence in this area, working closely with policy makers and programme decision makers in the region to get this evidence into use in making agriculture pro poor and pro nutrition and supporting development of climate resilient agriculture. Work is undertaken in four countries with high levels of malnutrition: Afghanistan, Bangladesh, India and Pakistan."
India: Infrastructure Equity Fund – Investment in small infrastructure projects in India's poorest states	1.12	1.44	Committed	ODA	Equity	Mitigation	Energy generation, renewable sources	To improve access to better quality transport, clean energy and basic urban services for households and businesses, by investing in equity to private sector-led infrastructure projects. This will benefit an estimated 280,000 people with improved infrastructure services.
ESPA – Eco System Services for Poverty Alleviation	0.22	0.28	Committed	ODA	Grant	Mitigation	General Environment Protection	To understand why ecosystems are becoming degraded, including as a result of climate change, 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.
ESPA – Eco System Services for Poverty Alleviation	0.87	1.12	Committed	ODA	Grant	Adaptation	General Environment Protection	To understand why ecosystems are becoming degraded, including as a result of climate change, 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.
Climate Smart Development for Nepal	0.52	0.68	Committed	ODA	Grant	Mitigation	Government & Civil Society	This will help Nepal to cope with impacts of climate change (CC) and promote clean development. It will provide strategic support to the Govt of Nepal to design and implement CC policies, to integrate resilience throughout government planning. This will:Improve resilience of 700,000 poor & vulnerable people (especially women) to floods, landslides, droughts in most remote districts;Improve resilience of businesses in 5 growing urban centres & 3 river basins through investments in urban planning, large scale irrigation systems & flood management;Facilitate connection of over 25,000 households to new micro-hydro power installations; connect over 70,000 homes to solar power & install RET in more than 200 schools/health clinics;Develop industry standard for 'clean' brick production and enable over half of the brick kilns (at least 400) to adopt more efficient technologies;Improve design of future CC programming & beyond through generation of world class evidence

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	Domestic currency (£m)	*USD ($m)*						
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Monitoring , Evaluation and Learning from the International Climate Fund	0.45	0.58	Committed	ODA	Grant	Mitigation	General Environment Protection	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.
Monitoring , Evaluation and Learning from the International Climate Fund	0.45	0.58	Committed	ODA	Grant	Adaptation	General Environment Protection	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.
Kenya Devolution Support Programme	0.27	0.35	Committed	ODA	Grant	Mitigation	Government & Civil Society	The Kenyan Constitution, adopted by referendum in 2010, introduced far reaching devolution to 47 newly-established counties. Hopes are high that devolution will improve accountability and service delivery and contribute to poverty reduction. The purpose of this programme is to build and improve public services for Kenyan citizens, particularly focusing at the county level where poverty exists and where public service delivery is poor. The programme will improve the ability of county governments to better plan, deliver and monitor the delivery of public services. This includes working with county governments to strengthen public financial management systems (e.g. improving accounting, audit and procurement systems) to ensure that public money is effectively spent and can be accounted for. It also includes a focus on critical services for example health and natural resource management (such as water scarcity due to climate change). The programme will help county governments to improve planning and allocation of budgets
Kenya Devolution Support Programme	0.63	0.81	Committed	ODA	Grant	Adaptation	Government & Civil Society	The Kenyan Constitution, adopted by referendum in 2010, introduced far reaching devolution to 47 newly-established counties. Hopes are high that devolution will improve accountability and service delivery and contribute to poverty reduction. The purpose of this programme is to build and improve public services for Kenyan citizens, particularly focusing at the county level where poverty exists and where public service delivery is poor. The programme will improve the ability of county governments to better plan, deliver and monitor the delivery of public services. This includes working with county governments to strengthen public financial management systems (e.g. improving accounting, audit and procurement systems) to ensure that public money is effectively spent and can be accounted for. It also includes a focus on critical services for example health and natural resource management (such as water scarcity due to climate change). The programme will help county governments to improve planning and allocation of budgets
Green Economic Growth for Papua	0.85	1.09	Committed	ODA	Grant	Mitigation	Forestry	"The programme aims to promote green growth in Papua. It will contribute to the government of Papua's vision and spatial plan that intends to preserve 90 per cent forest cover in the province. In doing so the programme will support the provinces transition away from a high carbon business as usual growth trajectory onto a low carbon development pathway. The programme is designed to address the key barriers to private sector development in Papua that will enable firms to pursue low carbon business opportunities. It will work directly with firms, the financial sector, and the public sector to improve the commercial and environmental sustainability of small and medium sized enterprises. In addition, the programme will generate knowledge on how green growth can be implemented in Indonesia and globally."
Regional Vulnerability Assessment and Analysis Programme	0.85	1.09	Committed	ODA	Grant	Adaptation	General Environment Protection	Supporting countries in the Southern Africa Development Community to measure vulnerability to climate change and use this to inform and strengthen emergency and development responses.
Care Adaptation Learning Programme	0.70	0.90	Committed	ODA	Grant	Adaptation	Agriculture	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. Including, specifically, to increase the capacity of vulnerable households in sub-Saharan Africa to adapt to climate variability and change.
Low Energy Inclusive Appliances	0.66	0.84	Committed	ODA	Grant	Mitigation	Energy Policy	To undertake research to accelerate the availability, affordability, efficiency and performance of Low Energy Inclusive Appliances (LEIA) suited to developing country contexts. Domestic and small-industrial electrical appliances are key to increasing the impact of energy access for poor consumers, expanding the markets for household solar and mini-grid systems, and enabling the most efficient use of available power where the grid is unreliable."

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Pakistan National Cash Transfers Programme'	0.63	0.80	Committed	ODA	Grant	Adaptation	Other Social Infrastructure & Services	To reduce poverty and improve living standards and educational attainment in the poorest families by providing regular payments to the female head of household. This includes reducing vulnerability to shocks such as flooding due to climate change. 315,000 additional beneficiary families will benefit by 2020. This programme will contribute to 1.05 million primary school children being supported in school and directly contribute to Millennium Development Goals 1: Eradicating extreme poverty and hunger; and Millennium Development Goals 2: Achieve universal primary education.
UK Support to Access to Finance Rwanda (AFR) Phase II Operations (2016-2020)	0.62	0.80	Committed	ODA	Grant	Adaptation	Banking & Financial Services	To support a deeper and more inclusive financial sector that supports the livelihoods and well-being of low income people in Rwanda. This will be done by: (1)Supporting the capacity and systems development of financial service providers that serve the poor, with a specific focus on automating the operations of Rwanda's Umurenge Savings and Credit Cooperatives (SACCOs) and their connectivity to microfinancial institutions and commercial banks; (2) Supporting the flow of financial services to the agriculture sector; (3) Supporting the development of pensions for informal sector workers to promote long term savings; and (4) Supporting improved resilience to shocks whilst reducing the risks associated with productive investments through the utilisation of microinsurance. AFR targets to enhance livelihood opportunities for 1,670,000 poor women and men during the period 2016-2020.
Zimbabwe Reconstruction Fund (ZIMREF)	0.12	0.15	Committed	ODA	Grant	Mitigation	Agriculture	To improve the business environment for growth, strengthen resilience (including to the impacts of climate change) and improve the skill set of the Zimbabwean people. This will be based on strong analytical work, policy dialogue and strengthened government systems for service delivery. The project will also improve donor coordination and World Bank capacity in Zimbabwe.
Zimbabwe Reconstruction Fund (ZIMREF)	0.48	0.62	Committed	ODA	Grant	Adaptation	Agriculture	To improve the business environment for growth, strengthen resilience (including to the impacts of climate change) and improve the skill set of the Zimbabwean people. This will be based on strong analytical work, policy dialogue and strengthened government systems for service delivery. The project will also improve donor coordination and World Bank capacity in Zimbabwe.
Africa Clean Energy Programme (ACE)	0.60	0.77	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	"The programme will catalyse a market based approach for private sector delivery of solar home system (SHS) products and services. This will lead to improved energy access for people in sub-Saharan Africa currently who are currently without modern energy. The programme will work in 14 priorty countries: Mozambique, Malawi, Zambia, Zimbabwe, Tanzania, Rwanda, Uganda, Kenya, Ethiopia, Somalia, Nigeria, Ghana, Sierra Leonne and Senegal. The programme will support: 1) Technical assistance to improve the enabling environment for a market based approach for private sector delivery of solar home system (SHS) products and services (Policy and Regulatory Reform, investment readiness, learning and Coordination) 2) Finance for businesses wanting to enter new and emerging SHS markets in sub-Saharan Africa for their start up and early commercialisation of ideas 3) Test innovative approaches to stimulating private sector investment and a market development."
Support to Bangladesh's National Urban Poverty Reduction Programme (NUPRP)	0.06	0.08	Committed	ODA	Grant	Mitigation	Urban development and management	Improvement in the integration of poor communities into municipal planning, budgeting and management, with a particular focus on women and girls and climate resilience; piloting of options for scale up and lesson learning at national level to inform overall urban policy and poverty reduction
Support to Bangladesh's National Urban Poverty Reduction Programme (NUPRP)	0.54	0.69	Committed	ODA	Grant	Adaptation	Urban development and management	Improvement in the integration of poor communities into municipal planning, budgeting and management, with a particular focus on women and girls and climate resilience; piloting of options for scale up and lesson learning at national level to inform overall urban policy and poverty reduction
Providing Humanitarian Assistance in Sahel Emergencies (PHASE)	0.58	0.74	Committed	ODA	Grant	Adaptation	Emergency Response	To provide humanitarian assistance to vulnerable people in the Sahel and help them to cope with future disasters, including strengthening early-warning mechanisms and disaster preparedness. This will be linked to the seasonal calendar and work alongside longer-term resilience programmes to reduce the long term demand for humanitarian assistance in the Sahel, and will be delivered through NGO and multilateral partners.
Reducing Maternal and Newborn Deaths in Kenya	0.27	0.34	Committed	ODA	Grant	Cross-cutting	Population Policies/ Programmes & Reproductive Health	To avert 4000 maternal deaths and 5500 neonatal deaths through nationwide life saving skills training for health professionals, and integrated health system strengthening in selected counties, 2013-2018, including water conservation and solar panels at health facilities.
Reducing Maternal and Newborn Deaths in Kenya	0.27	0.34	Committed	ODA	Grant	Cross-cutting	Population Policies/ Programmes & Reproductive Health	To avert 4000 maternal deaths and 5500 neonatal deaths through nationwide life saving skills training for health professionals, and integrated health system strengthening in selected counties, 2013-2018, including water conservation and solar panels at health facilities.

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Rural Water for Sudan (RW4S)	0.53	0.68	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	This programme will address the root causes of crisis in Darfur by tackling one of the main drivers of local conflict and poverty – availability of water. Water is scarce and there is competition over its use. This can result in conflict and lead to unsustainable livelihoods, forcing people to migrate to find alternatives. The climate is likely to get hotter and drier, further increasing scarcity of water. The programme will increase the availability of water for drinking and livelihoods for 250,000 people, and will support communities to sustainably manage their water resources for the benefit of all users. This will increase communities' resilience to the impacts of drought, contributing to more sustainable livelihoods and reducing the risk of conflict, overall improving stability in Darfur and reducing the pressure to migrate. In addition, the programme will improve sanitation and hygiene behaviour, improving the health and well-being of communities. 80% ICF funding.
Dar Es Salaam Port Improvement Programme (preparatory Phase)	0.26	0.34	Committed	ODA	Grant	Mitigation	Transport & Storage	To increase Tanzania's trade competiveness by providing the Port of Dar es Salaam with essential infrastructure and efficiency enhancements including reducing greenhouse gases and other emissions. This will benefit Tanzania and neighbouring countries through improved market access. This will contribute towards our G8 commitment to cut bureaucracy at international borders by reducing port dwell time from 9 to 5 days by 2017."
Dar Es Salaam Port Improvement Programme (preparatory Phase)	0.26	0.34	Committed	ODA	Grant	Adaptation	Transport & Storage	To increase Tanzania's trade competiveness by providing the Port of Dar es Salaam with essential infrastructure and efficiency enhancements including reducing greenhouse gases and other emissions. This will benefit Tanzania and neighbouring countries through improved market access. This will contribute towards our G8 commitment to cut bureaucracy at international borders by reducing port dwell time from 9 to 5 days by 2017."
Enhancing resilience in Karamoja Uganda	0.49	0.64	Committed	ODA	Grant	Adaptation	Agriculture	To increase the resilience of targeted communities to climate extremes and weather events. The programme will support 700,000 people to cope with the effects of climate change, this includes: 200,000 people with improved food security through participation in public works programmes; 6,000 agro-pastoralists and pastoralists with access to improved animal nutrition; and 175,000 children under five and pregnant and lactating women treated for malnutrition and with improved access to water by March 2017
Burma Humanitarian Assistance and Resilience Programme	0.49	0.63	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	To save lives, reduce poverty and suffering of 400,000 crisis affected people in Burma and Burmese refugees in Thailand through providing humanitarian assistance, enhancing resilience and building local and international organisations' capacity to respond to future humanitarian need in Burma. Longer term work on resilience and vulnerability will assist people to cope with shocks and stresses that will include climate-related shocks.
New Climate Economy Phase 2	0.36	0.47	Committed	ODA	Grant	Mitigation	Government & Civil Society	Phase II of the New Climate Economy will build on the success of the report launched in September 2014 by focusing on engagement with key decision-makers in priority countries; catalysing action on a small number of targeted opportunities for change; and developing and communicating a new report that focuses on supporting global growth and poverty reduction while reducing carbon emissions through international collaboration.
New Climate Economy Phase 2	0.12	0.16	Committed	ODA	Grant	Adaptation	Government & Civil Society	Phase II of the New Climate Economy will build on the success of the report launched in September 2014 by focusing on engagement with key decision-makers in priority countries; catalysing action on a small number of targeted opportunities for change; and developing and communicating a new report that focuses on supporting global growth and poverty reduction while reducing carbon emissions through international collaboration.
Carbon Market Finance for Africa (CMF-Africa)	0.32	0.41	Committed	ODA	Grant	Mitigation	Energy distribution	The project will transform the use of Clean Development Mechanism and other carbon market finance in Africa, for increased access to small scale, low carbon energy applications in rural areas. This will be through demonstrating the practical use and financial viability of innovative "standardised baselines" and new approaches to bundle small scale CDM projects (programmatic approaches)
Carbon Market Finance for Africa (CMF-Africa)	0.14	0.18	Committed	ODA	Grant	Adaptation	Energy distribution	The project will transform the use of Clean Development Mechanism and other carbon market finance in Africa, for increased access to small scale, low carbon energy applications in rural areas. This will be through demonstrating the practical use and financial viability of innovative "standardised baselines" and new approaches to bundle small scale CDM projects (programmatic approaches)
India: Affordable Housing in Poor States	0.45	0.58	Committed	ODA	Grant	Mitigation	Urban development and management	The project, in partnership with National Housing Bank, will stimulate the growth of the affordable housing market by providing loans to build 17,000 housing units and 10,000 home loans for low income families. This will result in 27,000 construction jobs for the poorest people in low income states in India by 2020. This programme is predominantly in the form of Development Capital Investment, which generates a return to the UK. The technical assistance will support policy and system strengthening for the scetor as well as promote innovative models and technologies. Appropriate choice of location will enhance resilience to climate shocks (flood, cyclone etc.) and disasters. Effective site planning and building envelope design, use of efficient building materials and construction practices, maximising the reuse and recycling of materials, and use of renewable resources can all help in reducing GHG emissions and environmental degradation.

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Development of Geothermal Energy in Montserrat	0.40	0.52	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	To support the development of geothermal energy in Montserrat, by undertaking the exploratory drilling and testing of 3 geothermal wells.
Infrastructure and Cities for Economic Development (ICED)	0.19	0.24	Committed	ODA	Grant	Mitigation	Urban development and management	To improve the enabling environment for sustainable, inclusive growth-enhancing infrastructure service delivery in DFID focus countries; and, Harness the benefits of cities for sustainable economic growth and poverty reduction in DFID focus countries. The ICED programme can help DFID to deliver low carbon growth and resilient economic growth which sustainably manage our natural resources.
Infrastructure and Cities for Economic Development (ICED)	0.19	0.24	Committed	ODA	Grant	Adaptation	Urban development and management	To improve the enabling environment for sustainable, inclusive growth-enhancing infrastructure service delivery in DFID focus countries; and, Harness the benefits of cities for sustainable economic growth and poverty reduction in DFID focus countries. The ICED programme can help DFID to deliver low carbon growth and resilient economic growth which sustainably manage our natural resources.
Energy Access Policy Fund	0.28	0.36	Committed	ODA	Grant	Mitigation	Energy Policy	To strengthen national and state level policies and practices that will enable India's poor gain access to energy, particularly achieving benefits for poor women and girls. The Fund will support development of policy products through the provision of technical assistance for enhancing access to power for cooking, lighting and productive activities . It will pilot projects for supply of electricity or renewable energy products in the poorest areas of Indian states such as Jharkhand, Orissa, Bihar etc.
13-91106 International Carbon Capture, Usage and Storage	5.00	6.44	Committed		Grant	Mitigation	Energy generation, non-renewable sources	Supports developing and emerging economies to develop both the technical and institutional knowledge necessary to enable CCUS technology deployment.
Energy Access Policy Fund	0.07	0.09	Committed	ODA	Grant	Adaptation	Energy Policy	To strengthen national and state level policies and practices that will enable India's poor gain access to energy, particularly achieving benefits for poor women and girls. The Fund will support development of policy products through the provision of technical assistance for enhancing access to power for cooking, lighting and productive activities . It will pilot projects for supply of electricity or renewable energy products in the poorest areas of Indian states such as Jharkhand, Orissa, Bihar etc.
Arid Lands Support Programme	0.17	0.22	Committed	ODA	Grant	Cross-cutting	Agriculture	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, increase average real value of assets owned by households, and will allow 64,000 beneficiaries to become less poor relative to non-beneficiaries in the four counties.
Arid Lands Support Programme	0.17	0.22	Committed	ODA	Grant	Cross-cutting	Agriculture	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, increase average real value of assets owned by households, and will allow 64,000 beneficiaries to become less poor relative to non-beneficiaries in the four counties.
Sustainable Inclusive Livelihoods through Tea Production in Rwanda	0.34	0.43	Committed	ODA	Grant	Adaptation	Trade Policies & Regulations	The project supports job creation and increased incomes by working with smallholder farmers to develop greenfield tea. The Wood Foundation Africa (TWFA) will set up and run two Services Companies supporting approximately 12,000 smallholder tea farmers over 7,500 hectares. Farmers will be supported to produce tea for the first time, employing best farming practices, including understanding and managing climate risk and variability.The Services Company will be co-owned by the farmers. This will lead to improved incomes and livelihoods (in particular nutrition and education) for the farmers and their families. Unilever and Luxmi will build a factory which will heavily rely on the tea supplied by the smallholder farmers with support from The Wood Foundation Africa.
Deepening Democracy Programme	0.10	0.12	Committed	ODA	Grant	Mitigation	Government & Civil Society	To improve the Kenyan Government's accountability to its citizens by delivering peaceful, transparent, inclusive elections and providing support to non-governmental organisations, oversight bodies and independent commissions that can influence and deliver reforms thereby supporting the goal of making Kenya a more stable democracy. The project aims to improve county government planning, budgeting, human resource management, results, performance management and citizen engagement. In each of these areas, UK support will focus on governance, health, climate change and local economic development.

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Deepening Democracy Programme	0.22	0.29	Committed	ODA	Grant	Adaptation	Government & Civil Society	To improve the Kenyan Government's accountability to its citizens by delivering peaceful, transparent, inclusive elections and providing support to non-governmental organisations, oversight bodies and independent commissions that can influence and deliver reforms thereby supporting the goal of making Kenya a more stable democracy. The project aims to improve county government planning, budgeting, human resource management, results, performance management and citizen engagement. In each of these areas, UK support will focus on governance, health, climate change and local economic development.
Increasing renewable energy and energy efficiency in the Eastern Caribbean	0.25	0.32	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	To increase the use of renewable energy and energy efficiency measures and to improve energy security in the Eastern Caribbean
Increasing renewable energy and energy efficiency in the Eastern Caribbean	0.06	0.08	Committed	ODA	Grant	Adaptation	Energy generation, renewable sources	To increase the use of renewable energy and energy efficiency measures and to improve energy security in the Eastern Caribbean
Achieving Water Security in the Southern Agricultural Growth Corridor	0.06	0.08	Committed	ODA	Grant	Mitigation	Water Supply & Sanitation	To ensure economic growth and poverty eradication resulting from investment in agriculture is sustainable in the context of climate change
Achieving Water Security in the Southern Agricultural Growth Corridor	0.19	0.25	Committed	ODA	Grant	Adaptation	Water Supply & Sanitation	To ensure economic growth and poverty eradication resulting from investment in agriculture is sustainable in the context of climate change
Economics of Low Carbon Development for Indonesia	0.13	0.16	Committed	ODA	Grant	Mitigation	General Environment Protection	To contribute to national debate on economic costs and benefits of unilateral and regional actions on mitigation and adaptation; to raise awareness about the urgency of climate change challenges and their potential socioeconomic impact on Indonesia, while informing other stakeholders (e.g., civil society, academia, media, nongovernment organizations, private sector, and aid agencies) of the same; and to indirectly support government and private sector actions in Indonesia to mitigate and adapt to climate change.
Economics of Low Carbon Development for Indonesia	0.13	0.16	Committed	ODA	Grant	Adaptation	General Environment Protection	To contribute to national debate on economic costs and benefits of unilateral and regional actions on mitigation and adaptation; to raise awareness about the urgency of climate change challenges and their potential socioeconomic impact on Indonesia, while informing other stakeholders (e.g., civil society, academia, media, nongovernment organizations, private sector, and aid agencies) of the same; and to indirectly support government and private sector actions in Indonesia to mitigate and adapt to climate change.
Market Development in Northern Ghana	0.24	0.31	Committed	ODA	Grant	Adaptation	Agriculture	To improve incomes and increase resilience of poor farmers and small-scale rural entrepreneurs in Northern Ghana
Sustainable Crop Production Research for International Development (SCPRID)	0.22	0.28	Committed	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 and less vulnerability to biotic and abiotic shocks which will result from new and emerging crop pests and diseases, climate change and water stress.
NIAF 2 – Nigeria Infrastructure Advisory Facility Phase 2	0.10	0.12	Committed	ODA	Grant	Mitigation	Urban development and management	To enhance the management of Nigeria's infrastructure development towards power sector reform, capital spending, repair and maintenance of roads, climate change adaptation and mitigation. This is expected to result to increased economic growth, job creation and contribute towards the MDGs by significantly reducing poverty for the majority of the Nigeria populace by year 2020.
NIAF 2 – Nigeria Infrastructure Advisory Facility Phase 2	0.10	0.12	Committed	ODA	Grant	Adaptation	Urban development and management	To enhance the management of Nigeria's infrastructure development towards power sector reform, capital spending, repair and maintenance of roads, climate change adaptation and mitigation. This is expected to result to increased economic growth, job creation and contribute towards the MDGs by significantly reducing poverty for the majority of the Nigeria populace by year 2020.
Bihar Agriculture Growth and Reform Initiative (BAGRI)	0.17	0.22	Committed	ODA	Grant	Adaptation	Agriculture	To significantly improve the performance of the agriculture sector in Bihar by improving access to markets for identified agriculture and horticulture products, access to finance, knowledge and technology, and institutional capacity for market regulation and support farmers in building resilience to the impacts of climate change such as drought and flooding. This will reflect higher private sector investment, higher production and higher price realisation by 1,00,000 farmers.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Stability and Growth Programme	0.16	0.2	Committed	ODA	Grant	Mitigation	Government & Civil Society	To improve macro-economic stability and growth in Pakistan by providing the Government with financial aid and technical assistance in support of the International Monetary Fund Extended Financing Facility. Energy subsidy reforms under the EFF should contribute to increased investment in green energy and less waste and carbon emissions. This will benefit the people of Pakistan by establishing the conditions for faster and more equitable growth. This contributes towards our MDGs by enabling the Government of Pakistan to finance essential public expenditure and protect the poor from the adverse impact of structural reforms.
Strengthening disaster resilience in Nepal	0.15	0.19	Committed	ODA	Grant	Adaptation	Disaster Prevention & Preparedness	This project will strengthen disaster resilience in Nepal, particularly to earthquakes, by working with urban centres to build and plan more safely; supporting the strengthening of critical public infrastructure to earthquakes; working to strengthen national capacity to respond to crises and ensure that the international community is prepared; and ensuring that the UK is able to support a humanitarian response should a crises hit.
Strengthening Economic Systems in Bangladesh	0.07	0.09	Committed	ODA	Grant	Mitigation	Government & Civil Society	To increase the dialogue on economic reforms, and support the Government of Bangladesh to make more pro-poor economic policies, including building evidence on the macro-economic impact of climate change and the economic impact of climate-induced migration.
Strengthening Economic Systems in Bangladesh	0.07	0.09	Committed	ODA	Grant	Adaptation	Government & Civil Society	To increase the dialogue on economic reforms, and support the Government of Bangladesh to make more pro-poor economic policies, including building evidence on the macro-economic impact of climate change and the economic impact of climate-induced migration.
Climate Change Programme – Jolobayoo-O-Jibon	0.04	0.05	Committed	ODA	Grant	Mitigation	General Environment Protection	Climate change adaptation and risk reduction measures to protect and improve the lives and livelihoods of 15 million poor and vulnerable people by 2017.
Climate Change Programme – Jolobayoo-O-Jibon	0.09	0.12	Committed	ODA	Grant	Adaptation	General Environment Protection	Climate change adaptation and risk reduction measures to protect and improve the lives and livelihoods of 15 million poor and vulnerable people by 2017.
Managing Climate Risks for Urban Poor	0.13	0.16	Committed	ODA	Grant	Adaptation	Urban development and management	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 in 25 medium-sized cities in 6 Asian countries (initially Pakistan, Bangladesh, India, Vietnam, Indonesia) by improving planning processes so that they consider climate change risks, for developing and funding new investment and infrastructure opportunities, and for knowledge and lesson sharing by 2018.
Support for Refugees in Kenya (2012-2016)	0.13	0.16	Committed	ODA	Grant	Mitigation	Emergency Response	Provide essential humanitarian assistance to save lives, relieve suffering, and maintain the dignity of Somali refugees in KenyaTo provide essential humanitarian assistance for up to 415,000 refugees in Kenya by ensuring improved access to clean water, sanitation, nutrition, health and protection services (e.g. police, secure accommodation for unaccompanied minors and victims of gender based violence). This will help save lives, relieve suffering, and maintain the dignity of refugees in Kenya.To provide essential humanitarian assistance for up to 535,000 refugees in Kenya by ensuring improved access to clean water, sanitation, nutrition, health and protection services (e.g. secure accommodation for unaccompanied minors and victims of gender based violence) and sustainable climate change interventions. This will help save lives, relieve suffering, and maintain the dignity of refugees in Kenya in a sustainable way.
Decentralised Renewable Energy Access Markets (DREAM)	0.11	0.14	Committed	ODA	Grant	Mitigation	Energy distribution	DREAM will help three of the poorest States in India provide energy to around 1.8m people. It will use UK expertise to mobilise public and private investment in sustainable and affordable energy supplies delivered by private energy businesses – creating 2000 jobs and supporting at least 200 women develop energy businesses.
Technical Assistance for Smart Cities (TASC)	0.07	0.08	Committed	ODA	Grant	Mitigation	Urban development and management	To enhance the potential of Indian cities in poorer and developing states such as Madhya Pradesh, Bihar, Andhra Pradesh, Odisha, Maharashtra to promote growth and jobs creation. UK support will achieve this by developing partnerships with UK urban planning, research and business organisations to help India cities develop investment plans, attract finance and deliver smart urban solutions that create jobs for the urban poor. Activities including climate resilient infrastructure, climate and disaster risk insurance, renewable energy and water management.
Technical Assistance for Smart Cities (TASC)	0.04	0.06	Committed	ODA	Grant	Adaptation	Urban development and management	To enhance the potential of Indian cities in poorer and developing states such as Madhya Pradesh, Bihar, Andhra Pradesh, Odisha, Maharashtra to promote growth and jobs creation. UK support will achieve this by developing partnerships with UK urban planning, research and business organisations to help India cities develop investment plans, attract finance and deliver smart urban solutions that create jobs for the urban poor. Activities including climate resilient infrastructure, climate and disaster risk insurance, renewable energy and water management.

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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*	
	Domestic currency (£m)	*USD ($m)*						
Adaptation for Smallholder Agricultural Programme (ASAP)	0.02	0.02	Committed	ODA	Grant	Mitigation	Agriculture	To provide knowledge and best practices to help over 6 million smallholder farmers in up to 43 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; help farmers access markets to sell their crops; to plant trees on farms and introduce soil and water conservation practices; and, enable farmers to access daily and seasonal weather forecasts (e.g. using text messages) so they know when best to plant and harvest crops."
Adaptation for Smallholder Agricultural Programme (ASAP)	0.08	0.1	Committed	ODA	Grant	Adaptation	Agriculture	To provide knowledge and best practices to help over 6 million smallholder farmers in up to 43 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; help farmers access markets to sell their crops; to plant trees on farms and introduce soil and water conservation practices; and, enable farmers to access daily and seasonal weather forecasts (e.g. using text messages) so they know when best to plant and harvest crops."
Sustainable Development of Mining in Rwanda (SDMR)	0.08	0.1	Committed	ODA	Grant	Cross-cutting	Mineral Resources & Mining	SDMR aims to improve the livelihoods of over 40,000 Rwandans involved in the artisanal and small scale mining industry. Moreover, it will tackle Rwanda's growing trade deficit by increasing exports, help to attract much-needed private investment in the industry, and ultimately support Rwanda's path to economic transformation by creating more, higher paid, safer jobs for poor Rwandans. The outcome of the programme will be an economically, socially and environmentally sustainable ASM in target areas.This will contribute to the impact of an increased contribution of the mining sector to economic growth and improving livelihoods among ASM communities and improved management and operations of mines will reduce climate change related flooding and landslide risks.
Sustainable Development of Mining in Rwanda (SDMR)	0.01	0.02	Committed	ODA	Grant	Cross-cutting	Mineral Resources & Mining	SDMR aims to improve the livelihoods of over 40,000 Rwandans involved in the artisanal and small scale mining industry. Moreover, it will tackle Rwanda's growing trade deficit by increasing exports, help to attract much-needed private investment in the industry, and ultimately support Rwanda's path to economic transformation by creating more, higher paid, safer jobs for poor Rwandans. The outcome of the programme will be an economically, socially and environmentally sustainable ASM in target areas.This will contribute to the impact of an increased contribution of the mining sector to economic growth and improving livelihoods among ASM communities and improved management and operations of mines will reduce climate change related flooding and landslide risks.
Zambia Health Systems Strengthening Programme	0.06	0.08	Committed	ODA	Grant	Adaptation	Population Policies/ Programmes & Reproductive Health	The Zambia Health Systems Strengthening programme aims improve the health of women and girls in Zambia across the continuum of care from birth, childhood and motherhood. This together with our other parallel interventions to strengthen the health system, will by 2021 result in a reduction in child and maternal deaths by 25% and 15% respectively and contribute towards attainment of the sustainable development goal for health. The nutrition status of 500,000 children, women and young girls will be improved and 270,000 girls and women gain access to family planning. It will ensure that Zambia is able to prevent, detect, and raise a comprehensive response to disease outbreaks and the effects of climate change.
Multi-Stakeholder Forestry Programme – Nepal	0.03	0.04	Committed	ODA	Grant	Mitigation	Forestry	Nepal's forestry sector contributing to inclusive economic growth, poverty reduction and tackling climate change
Multi-Stakeholder Forestry Programme – Nepal	0.03	0.04	Committed	ODA	Grant	Adaptation	Forestry	Nepal's forestry sector contributing to inclusive economic growth, poverty reduction and tackling climate change
Building Resilience and adapting to climate change in Malawi	0.06	0.08	Committed	ODA	Grant	Adaptation	Other Social Infrastructure& Services	This programme aims to strengthen the resilience of poor households in Malawi to withstand current and projected weather and climate-related shocks and stresses. This will in turn halt the annual cycle of humanitarian crises that blights people's lives, harms poverty reduction efforts and swallows up resources. The UK will invest up to £70 million over five years (2018-2023) to provide direct benefits to 1.7 million poor and vulnerable people in Malawi (approximately 300,000 households).
Smart Urban Development in Indian States (SmUDI)	0.03	0.03	Committed	ODA	Grant	Mitigation	Urban development and management	Provide UK support on urban governance, planning, finance and city partnerships to deliver Government of India's urban development programmes in select UK-India partner cities. The support will bring the best expertise from the UK to help create economically vibrant, safe and climate resilient cities in India.
Smart Urban Development in Indian States (SmUDI)	0.02	0.02	Committed	ODA	Grant	Adaptation	Urban development and management	Provide UK support on urban governance, planning, finance and city partnerships to deliver Government of India's urban development programmes in select UK-India partner cities. The support will bring the best expertise from the UK to help create economically vibrant, safe and climate resilient cities in India.

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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*	
	Domestic currency (£m)	*USD ($m)*						
Results Based Financing for Low Carbon Energy Access	0.03	0.03	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	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. This is expected to benefit around 1.3m people by 2018, while reducing carbon emissions by around 260,000 Tonnes of carbon dioxide, through supported private investment in the installation and operation of over 110 renewably-powered mini-grids (figures to be updated after Business Case completion). Electricity access for lighting, communications and productive uses creates jobs, enables studying at night and enhances public services (such as clinics) and public safety (eg through streetlighting). This project also addresses the post-2015 High Level Panel's recommendation on a development goal entitled Secure Sustainable Energy, which includes energy access and renewable energyThe Results-Based Financing for Low Carbon Energy Access Programme aims to accelerate access to sustainable energy services in developing countries. The funding generates and tests different forms of Results-Based Financing (RBF) mechanism, which aim to stimulate decentralised energy markets and to leverage private investment to increase access to clean energy products and services.
Results Based Financing for Low Carbon Energy Access	0.01	0.01	Committed	ODA	Grant	Adaptation	Energy generation, renewable sources	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. This is expected to benefit around 1.3m people by 2018, while reducing carbon emissions by around 260,000 Tonnes of carbon dioxide, through supported private investment in the installation and operation of over 110 renewably-powered mini-grids (figures to be updated after Business Case completion). Electricity access for lighting, communications and productive uses creates jobs, enables studying at night and enhances public services (such as clinics) and public safety (eg through streetlighting). This project also addresses the post-2015 High Level Panel's recommendation on a development goal entitled Secure Sustainable Energy, which includes energy access and renewable energyThe Results-Based Financing for Low Carbon Energy Access Programme aims to accelerate access to sustainable energy services in developing countries. The funding generates and tests different forms of Results-Based Financing (RBF) mechanism, which aim to stimulate decentralised energy markets and to leverage private investment to increase access to clean energy products and services.
Asia Regional Resilience to a changing climate (ARRCC)	0.01	0.02	Committed	ODA	Grant	Adaptation	General Environment Protection	a regional partnership in South Asia among the research community, its funders, and users foster a more coordinated and interactive climate research environment that supports good decision making
Support to the multilateral Climate Investment Funds (CIFs), four funding windows supporting country-led investments in low carbon, climate-resilient development	–	0	Committed	ODA	Grant	Mitigation	General Environment Protection	To support development and poverty reduction through environmental protection, and help developing countries respond to climate change
Support to the multilateral Climate Investment Funds (CIFs), four funding windows supporting country-led investments in low carbon, climate-resilient development	–	0	Committed	ODA	Grant	Adaptation	General Environment Protection	To support development and poverty reduction through environmental protection, and help developing countries respond to climate change
Support for Energy Sector Analysis that influences global energy decision makers	–	0	Committed	ODA	Grant	Mitigation	Energy Policy	Develping countries have adopted pro-poor low carbon development pathways in line with trajectories for a 2 degree world by 2020
Support for Energy Sector Analysis that influences global energy decision makers	–	0	Committed	ODA	Grant	Adaptation	Energy Policy	Develping countries have adopted pro-poor low carbon development pathways in line with trajectories for a 2 degree world by 2020
Scaling up of the Energy and Environment Partnership with Southern and East Africa	–	0	Committed	ODA	Grant	Mitigation	Energy distribution	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
Scaling up of the Energy and Environment Partnership with Southern and East Africa	–	0	Committed	ODA	Grant	Adaptation	Energy distribution	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
Negative ODA flow	-1.70	-2.18	Committed	ODA	Grant	Mitigation	Health, General	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

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	Domestic currency (£m)	*USD ($m)*						
Negative ODA flow	-4.00	-5.15	Committed	ODA	Grant	Adaptation	Health, General	
Negative ODA flow	-0.03	-0.04	Committed	ODA	Grant	Adaptation	Energy Policy	
Negative ODA flow	-0.26	-0.33	Committed	ODA	Grant	Mitigation	General Environment Protection	
Negative ODA flow	-0.26	-0.33	Committed	ODA	Grant	Adaptation	General Environment Protection	
Negative ODA flow	-0.46	-0.6	Committed	ODA	Grant	Cross-cutting	Agriculture	
Negative ODA flow	-2.63	-3.39	Committed	ODA	Grant	Cross-cutting	Agriculture	
Blue Forests Programme	1.21	1.55	Committed	ODA	Grant	Cross-cutting	Forestry Development	Working to reduce deforestation of mangrove habitat, create new sustainable livelihoods, support community health and women's empowerment and increase climate resilience in coastal communities. This project will initially be executed in Madagascar, expanding to Indonesia and an additional country in south-east Asia. Programme is projected to protect 20,000 hectares of mangrove forests; deliver 13.9 million tonnes of carbon dioxide savings and benefit over 100,000 people.
UK Climate Investments	7.80	10.04	Committed	ODA	Equity	Mitigation	Energy generation, renewable sources	Joint venture with the UK Green Investment Bank to make equity investments in private sector renewable and energy efficiency projects in developing countries
Administrative and due diligence costs	2.10	2.7	Committed	ODA	Grant	Mitigation	Environmental policy and administrative management	ODA eligible costs associated with the management and delivery of climate programmes, including expenditure on external legal advice, evaluation and auditing services to support ODA spend.
Renewable Energy Performance Platform	2.80	3.6	Committed	ODA	Grant	Mitigation	Energy generation, renewable sources	Supporting private sector investment in small to medium scale renewable energy projects, primarily in Africa
Nationally Appropriate Mitigation Actions (NAMA) Facility	40.00	51.48	Committed	ODA	Grant	Mitigation	General Environment Protection	The Facility supports developing countries that show strong leadership on tackling climate change and who want to implement transformational Nationally Appropriate Mitigating Actions.
Sustainable Infrastructure Programme – Latin America	52.00	66.92	Committed	ODA	Grant	Mitigation	Multisector Aid	UK-branded private finance flagship programme provides concessional financing and technical assistance for sustainable infrastructure in Latin America.
International 2050 Pathways partnerships	0.03	0.04	Committed	ODA	Grant	Mitigation	Energy research	Working directly with 10 developing country governments to help them build their own version of the UK's 2050 calculator. The calculator will explore global scenarios, illustrating the impacts of these scenarios on climate change.
Global Climate Partnership Fund – Technical Assistance Facility	4.00	5.15	Committed	ODA	Grant	Mitigation	Energy conservation and demand side efficiency	Finances energy efficiency and small scale renewable energy projects in developing countries whilst giving Technical Assistance to build the green lending capacity of local banks and reducing investment risk.
NDC Partnership	0.50	0.64	Committed	ODA	Grant	Mitigation	General Environment Protection	The NDC Partnership is a new international partnership aiming to help turn countries' climate targets under the Paris Agreement, known as Nationally Determined Contributions (NDCs), into specific strategies and measures.
Reduction of emissions caused from deforestation and forest degradation – REDD+ early movers (REM) programme	42.90	55.21	Committed	ODA	Grant	Mitigation	Forestry	Tackles emissions from deforestation, catalysing action on the ground through results based payments for verified and ambitious emission reductions.
International Carbon Capture, Usage and Storage	5.00	6.44	Committed	ODA	Grant	Mitigation	Energy generation, non-renewable sources	Supports developing and emerging economies to develop both the technical and institutional knowledge necessary to enable CCUS technology deployment.
Climate Public Private Partnership – Asia Climate Partners	4.70	6.05	Committed	ODA	Equity	Mitigation	Energy generation, renewable sources	An equity investment in a fund that seeks to demonstrate to private sector investors that climate friendly investments in developing countries are financially viable.
Fiji Support Programme	0.70	0.9	Committed	ODA	Grant	Cross-cutting	Public sector policy and administrative management	Building Fiji's capacity to maximise it's effectiveness during it's presidency of the UNFCCC this year.
Forest Carbon Partnership Facility – Carbon Fund	30.00	38.61	Committed	ODA	Grant	Mitigation	Forestry	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.

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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*	
	Domestic currency (£m)	*USD ($m)*						
Intergovernmental Panel on Climate Change – voluntary contribution	0.10	0.13	Committed	ODA	Grant	Cross-cutting	Environmental research	Supporting attendance by developing countries at IPCC Plenary meetings, scoping meetings and author meetings
Global Innovation Lab for Climate Finance	0.30	0.39	Committed	ODA	Grant	Mitigation	Business support services and institutions	Programme identifies, designs, and supports 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.
Support for international negotiations for the Paris Agreement	0.20	0.26	Committed	ODA	Grant	Mitigation	Environmental policy and administrative management	To develop capacity of developing country negotiators to engage in international climate negotiations.

Table 7b

Provision of public financial support: contribution through bilateral, regional and other channels 2018

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	Domestic currency (£m)	*USD ($m)*						
CDC Programme of Support in Africa and South Asia (2015-2022)	33.4	44.47	Committed	ODA	equity	Mitigation	Banking & Financial Services	Centrally Managed – To enable CDC to scale up its activity of investing and lending to support the building of businesses in developing countries, to create jobs and make a lasting difference to people's lives in some of the world's poorest places. CDC is DFID's main vehicle for investing in private companies in Africa and South Asia. CDC encourages capital investments, including in climate change mitigation and adaptation measures, from other private investors by being a first mover, demonstrating to other investors that commercial returns are possible in these frontier markets, and by sharing risk and expertise. The additional equity from DFID will enable CDC to meet demand for capital in its target markets and allow CDC to sustain a higher volume of more developmental investments across priority regions and business sectors.
Productive Safety Net Programme Phase 4	31.1	41.45	Committed	ODA	grant	Adaptation	Other Social Infrastructure & Services	Ethiopia – To reduce hunger, improve livelihoods and reduce the risk of famine in rural Ethiopia by (i) providing cash and food transfers, livelihoods advice and access to microfinance to 1.2 million extremely poor Ethiopians and (ii) creating local infrastructure which reverses environmental degradation and improves access to markets and basic services. 85% of participant households receive transfers as wages for labour on public works projects (including 32,000 km of hillside terraces, 3,000 km of rural roads and 400 new or expanded schools); while the remainder (the elderly, those with disabilities, and pregnant women) receive cash and / or food without a labour requirement. This programme contributes towards national and international development goals and DFID's own targets for reducing poverty and hunger and for building household resilience to climate change and other shocks.
Building Resilience in Ethiopia (BRE)	28.5	38.00	Committed	ODA	grant	Adaptation	Emergency Response	Ethiopia – To build Ethiopia's resilience to climate and humanitarian shocks by seeking to support the Government of Ethiopia to lead an effective and accountable humanitarian response system. It will have four key strands: Providing technical assistance to the Government of Ethiopia to lead and deliver an effective and accountable humanitarian response , delivering food and cash to people in humanitarian need in the most effective way, respond to emergency humanitarian needs in the most effective way and monitoring, evaluation and learning to strengthen humanitarian delivery in Ethiopia.
Building Resilience and Adaptation to Climate Extremes and Disasters	26.2	34.89	Committed	ODA	grant	Adaptation	General Environment Protection	Centrally Managed – 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). 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. These will all contribute to the Millennium Development Goals on the eradication poverty and hunger, and environmental sustainability, and also respond to the Humanitarian and Emergency Response Review recommendation that DFID should integrate the threat from climate change into a Disaster Risk Reduction.
CGIAR 2017-20: Support to develop and deploy the next generation of agriculture technology to support poor farmers by the international agriculture research organisation the CGIAR, 2017-20	21.6	28.80	Committed	ODA	grant	Adaptation	Agriculture	Centrally Managed – To enable the CGIAR to scale up its research, contributing to the development of new crop varieties which are more productive and tolerant of biotic and abiotic stress. Development of farming systems which are more resilient, including to the effects of climate change, and more productive, the development of markets and value chains which are better able to deliver benefits to poor people and policies and technology which will directly support better nutritional and health outcomes for the poor.
CGIAR 2017-20: Support to develop and deploy the next generation of agriculture technology to support poor farmers by the international agriculture research organisation the CGIAR, 2017-20	2.4	3.20	Committed	ODA	grant	Mitigation		
Disaster Risk Insurance	21.3	28.40	Committed	ODA	grant/loan	Adaptation	Banking & Financial Services	Centrally Managed – To improve the resilience of the private sector in poor countries to natural disasters by improving access to insurance products. By supporting the development of a market for private sector disaster risk insurance in developing countries, the project will sustainably help strengthen resilience, mitigate the effects of climate change and supporting economic development through private sector growth.

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	Domestic currency (£m)	*USD ($m)*						
Forest Governance, Markets and Climate	10.5	13.95	Committed	ODA	grant	Mitigation	Forestry	Centrally Managed – A global programme supporting governance and market reforms aimed at reducing the illegal use of forest resources, benefitting poor forest-dependent people and promoting sustainable growth in developing countries.
Forest Governance, Markets and Climate	10.5	13.95	Committed	ODA	grant	Adaptation		
Increasing renewable energy and energy efficiency in the Eastern Caribbean	13.5	17.93	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Caribbean – To increase the use of renewable energy and energy efficiency measures and to improve energy security in the Eastern Caribbean.
Increasing renewable energy and energy efficiency in the Eastern Caribbean	3.4	4.48	Committed	ODA	grant	Adaptation		
Second phase of DFID's Support to the Private Infrastructure Development Group (PIDG).	16.7	22.20	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Centrally Managed – The aim of PIDG is to mobilise private investment in infrastructure, including renewable energy, in order to increase service provision for the poor, boost economic growth, trade and jobs to alleviate poverty in the world's poorest countries.
TEA – Transforming Energy Access	16.1	21.51	Committed	ODA	grant	Mitigation	Energy Policy	Centrally Managed – The project is up to £65 million over five years, to support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy services for poor households and enterprises, especially in Africa. The programme will include: i) partnership with Shell Foundation, enabling support to another 30+ early stage private sector innovations. ii) Innovate UK's Energy Catalyst to stimulate technology innovation by UK enterprises; iii) build other strategic clean energy innovation partnerships (e.g. testing a new 'P2P Solar' crowdfunding platform; and scoping a potential new partnership with Gates Foundation on Mission Innovation); iv) skills and expertise development. To support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy services for poor households and enterprises, especially in Africa.
Strategic Partnership Arrangement II between DFID and BRAC	16.0	21.33	Committed	ODA	grant	Adaptation	Basic Education	Bangladesh – To provide support to BRAC's development programmes to improve access to quality basic services (health, education, water and sanitation), help the poorest, most marginalised people across the whole of Bangladesh graduate from extreme poverty, support inclusive growth and help build effective formal and informal institutions. Climate finance will be integrated across BRAC's programmes to strengthen the resilience of BRAC's investments and the communities they serve. UK support will include: helping over 950,000 children (600,000 girls) gain a decent education; providing additional nutritional support to 11 million people (7 million women and girls); helping 5.7 million girls and women gain access to family planning services; providing at least 75,000 people with sustainable access to clean water and sanitation; supporting over 80,000 women to better cope with the effects of climate change; and lifting 240,000 women and their families (over 960,000 people) out of extreme poverty.
Africa Division funding to the African Agriculture Development Company (AgDevCo)	12.5	16.67	Committed	ODA	grant	Adaptation	Agriculture	Africa Regional – AgDevCo is a specialised investor and project developer focused exclusively on early stage Small and Medium Enterprise agribusiness in Sub Saharan Africa. AgDevCo deploys patient capital and technical assistance to build profitable businesses that contribute to food security, drive economic growth and create jobs and income in rural areas and contribute to farmers' resilience to climate change. It currently operates in Sierra Leone, Ghana, Rwanda, Malawi, Mozambique, Tanzania, Uganda, Zambia.
CARIAA – Collaborative Adaptation Research Initiative in Africa and Asia	12.2	16.21	Committed	ODA	grant	Adaptation	General Environment Protection	Centrally Managed – Research to identify what works and what doesn't in terms of cost-effective and sustainable ways to improve the resilience and capacity to adapt to climate change of the poorest and most vulnerable people and communities in three climate change 'hot spots' – semi-arid regions of Africa and Central and South Asia; low-lying heavily populated deltas of Africa and South Asia and; densely populated river basins dependent on snow-pack or glaciers.
Building Resilience in the Sahel through Adaptive Social Protection	12.0	16.00	Committed	ODA	grant	Adaptation	Other Social Infrastructure & Services	Sahel – 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 to climate change and can be scaled in a time of crisis.
Rehabilitation of Freetown's Water Supply System	11.5	15.30	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Sierra Leone – The project will increase sustainable access to safe water in Freetown, the capital city, and safe-guard water security and reduce climate change vulnerability. This will be achieved through rehabilitation of water infrastructure for improved public service delivery of water.

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Regional Economic Development for Investment and Trade (REDIT) Programme	5.4	7.16	Committed	ODA	grant	Adaptation	Trade Policies & Regulations	Kenya – The programme aims to increase sustainable and shared prosperity in Kenya by increasing Kenya's trade with the region and the rest of the world. Specifically, the programme will (i) invest in improving the efficiency and capacity of transport, logistics and trade infrastructure at Mombasa Port and key border points; (ii) invest in systems to improve trading standards, reduce non-tariff barriers and enhance transparency in trade processes; (iii) improve the regulatory and policy environment for trade; and (iv) support private sector advocacy for trade competitiveness, the export capacity of Kenyan businesses and the greater participation of women and small and growing businesses in trade. ICF component is supporting Kenya Ports Authority to develop and implement a Green Port Policy to help the port adapt and become resilient to climate change. Key objectives include introducing new climate friendly technologies into the port's operations.
Regional Economic Development for Investment and Trade (REDIT) Programme	5.4	7.16	Committed	ODA	grant	Mitigation		
Investments in Forests and Sustainable Land Use	5.4	7.13	Committed	ODA	grant	Adaptation	Forestry	Centrally Managed – To support public-private partnerships that demonstrate how companies, communities, smallholders and governments can work collaboratively to reduce deforestation and benefit forest dependent communities.
Investments in Forests and Sustainable Land Use	5.4	7.13	Committed	ODA	grant	Mitigation		
Hunger Safety Net Programme	10.4	13.81	Committed	ODA	grant	Adaptation	Other Social Infrastructure & Services	Kenya – To reduce poverty, hunger and vulnerability by providing the poorest households in Kenya's arid and semi-arid lands with cash transfers including in response to climate shocks such as droughts. 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.
Northern Uganda: Transforming the Economy through Climate Smart Agribusiness (NU-TEC)	9.1	12.17	Committed	ODA	grant	Adaptation	Agriculture	Uganda – To increase the resilience to climate change of poor farmers in Northern Uganda, and to increase their incomes. This will be achieved by working with agricultural businesses to supply farmers with cheaper, better and more varied agricultural inputs and services, and to create stronger markets for farmer produce. This will benefit 250,000 households in Northern Uganda, who will adopt new practices, products and markets that will make them more resilient to climate change, while 150,000 households will see measurable increases to income. This will contribute to the MDGs (and their successor targets) by reducing poverty in Uganda.
Northern Uganda: Transforming the Economy through Climate Smart Agribusiness (NU-TEC)	1.0	1.35	Committed	ODA	grant	Mitigation		
Solar Nigeria Programme	8.4	11.23	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Nigeria – 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.
Solar Nigeria Programme	1.5	1.97	Committed	ODA	grant	Adaptation		
Multi-Year Humanitarian Programme in Pakistan	9.7	12.90	Committed	ODA	grant	Adaptation	Emergency Response	Pakistan – Support for up to three million of the most vulnerable people affected by natural disaster and conflict. This will cover both immediate relief and early recovery interventions for shelter, food, non-food items, water and sanitation, livelihood and protection needs, depending on the emergency, including enhancing resilience of the beneficiary communities to climate extremes such as floods and droughts. This programme will also support developments in the UN and local civil society which are required for humanitarian responses to be more locally owned and effective in future, as well as effective monitoring and evaluation, targeted active research and piloting.
UK Caribbean Infrastructure Fund	8.4	11.20	Committed	ODA	grant	Adaptation	Transport & Storage	Caribbean – As announced by the UK government in September 2015, the UK Caribbean Infrastructure Fund will create critical economic infrastructure including: bridges; renewable energy; ports; water; and sea defences that will increase productivity and resilience to natural disasters and climate change. This fund aims to improve economic development in 8 ODA eligible and 1 ODA eligible Overseas Territory by helping to boost growth and creating jobs across the region.
UK Caribbean Infrastructure Fund	1.0	1.37	Committed	ODA	grant	Mitigation		

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Africa Clean Energy Programme (ACE)	8.3	11.06	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Africa Regional – The programme will catalyse a market based approach for private sector delivery of solar home system (SHS) products and services. This will lead to improved energy access for people in sub-Saharan Africa currently who are currently without modern energy. The programme will work in 14 priorty countries: Mozambique, Malawi, Zambia, Zimbabwe, Tanzania, Rwanda, Uganda, Kenya, Ethiopia, Somalia, Nigeria, Ghana, Sierra Leonne and Senegal. The programme will support: 1) Technical assistance to improve the enabling environment for a market based approach for private sector delivery of solar home system (SHS) products and services (Policy and Regulatory Reform, investment readiness, learning and Coordination); 2) Finance for businesses wanting to enter new and emerging SHS markets in sub-Saharan Africa for their start up and early commercialisation of ideas; and 3) Test innovative approaches to stimulating private sector investment and a market development.
Humanitarian Assistance and Resilience in South Sudan (HARISS) 2015 – 2020	8.0	10.71	Committed	ODA	grant	Adaptation	Emergency Response	South Sudan – To help approximately three million South Sudanese by providing critical life-saving support and helping people to better cope with shocks from conflict, drought and flooding. This programme aims to save the lives of an estimated two million people who will receive at least one form of humanitarian assistance; and build the capacity of an estimated one million people to recover and cope better with shocks. Over five years this programme will provide food, shelter and access to water and health services to millions of vulnerable people, including women and children.
Support to the Global Agriculture and Food Security Programme (GAFSP)	6.0	8.00	Committed	ODA	grant	Adaptation		
Support to the Global Agriculture and Food Security Programme (GAFSP)	2.0	2.67	Committed	ODA	grant	Mitigation	Agriculture	Centrally Managed – To improve agricultural productivity in developing countries and to increase farmers' access to markets whilst increasing the economic resilience of poor people globally.
Forestry, Land-use and Governance in Indonesia	8.0	10.65	Committed	ODA	grant	Mitigation	Forestry	Indonesia – To reduce greenhouse gas emissions and deforestation in Indonesia as part of the UK's efforts to avoid catastrophic climate change that would hit the very poorest first and set back global efforts at poverty reduction.
Transboundary Water Management in Southern Africa	7.9	10.52	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Africa Regional – The project will support countries in Southern Africa to manage their shared water resources, thereby helping 2-3 million poor people to better cope with the impacts of existing climate variability and climate change (especially floods and drought). It will do this by improving assessment and planning concerning these resources, and designing and building water infrastructure such as irrigation schemes, water supply or hydropower schemes. This will help poor and vulnerable people gain access to clean and safe water, produce a predictable agricultural yield and store water for when it is needed during the dry months of the year. The programme will also help countries to communicate hydrological data between themselves – thus providing downstream countries with advance notice of floods and enabling countries to optimise how much water is stored in each country to ensure each has enough to meet their basic requirements.
Strengthening Health Facilities in the Caribbean	7.3	9.68	Committed	ODA	grant	Adaptation		
Strengthening Health Facilities in the Caribbean	0.4	0.51	Committed	ODA	grant	Mitigation	Health, General	Caribbean – To provide safer, greener health facilities in Belize, Dominica, Grenada, Guyana, Jamaica, St Lucia and Saint Vincent and the Grenadines to deliver care in disasters, generate operational savings and reduce disaster losses.
Malawi Humanitarian Preparedness and Response Programme	7.4	9.83	Committed	ODA	grant	Adaptation	Disaster Prevention & Preparedness	Malawi – To prepare to meet the food and nutritional needs of over 2.8 million of Malawi's most vulnerable and food insecure people following the recent devastating floods in the country for 2015/16 and following the early cessation of rains and other factors that have caused hunger across the country.
Climate Proofing Growth and Development in South Asia	7.3	9.79	Committed	ODA	grant	Adaptation	Government & Civil Society	Asia Regional – Integrate climate change into development planning, budgeting and delivery in national and sub-national governments in Afghanistan, India, Nepal and Pakistan.This will done by strengthening planning, budgeting, delivery mechanisms, building awareness and capacity of stakeholders through technical and some implementation support. It will help to mobilise domestic and International finance. Sharing lesssons and knowledge in South Asia is a key element of the project.
FCFA – Future Climate For Africa	5.0	6.71	Committed	ODA	grant	Adaptation		
FCFA – Future Climate For Africa	2.2	2.87	Committed	ODA	grant	Mitigation	General Environment Protection Agriculture	Centrally Managed – The Future Climate for Africa programme supports world-leading science and technology to enhance understanding and prediction of sub-Saharan African climate and, through working closely with African stakeholders, bring this knowledge into use in informing major decisions, such as infrastructure investments, urban planning and national policy. The programme has three main objectives: firstly, to produce world-leading science to advance knowledge of African climate variability and change and enhance prediction of future African climate; secondly, to drive improved knowledge, methods and tools on how climate information and services can be better designed for, delivered and integrated into major decisions today and thirdly, to support international collaboration and the development of scientific capacity in Africa.

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Livelihoods and Food Security Trust Fund for Burma (NUTSEM)	7.0	9.33	Committed	ODA	grant	Adaptation	Agriculture	Myanmar – To improve the incomes and nutrition status of over 1.63 million poor people in Burma by promoting resilient livelihoods and food security through agricultural commercialisation and climate smart agriculture, financial inclusion, business and skills development, and targeted nutrition support to mothers and children in the 'One thousand day' window between conception and a child's second birthday.
Building Disaster Resilience in Pakistan	6.8	9.06	Committed	ODA	grant	Adaptation	Emergency Response	Pakistan – DFID support will strengthen community and household resilience to emergencies and disasters over six years. The programme will aim to build resilience in communities and households in Pakistan to manage the impact of disasters by maintaining or transforming living standards in the face of shocks and stresses without compromising their long-term prospects.
WISER – Weather and climate Information and SERvices for Africa	5.0	6.64	Committed	ODA	grant	Adaptation		
WISER – Weather and climate Information and SERvices for Africa	1.2	1.65	Committed	ODA	grant	Mitigation	Disaster Prevention & Preparedness	Africa Regional – WISER will help at least 24 million people across Africa (focusing initially on East Africa (Ethiopia, Kenya, Tanzania, Uganda, Rwanda and Burundi) to be more resilient to natural disasters and climate change by 2030 by improving early warning systems (giving more time to prepare for heavy rains for example) as well as helping them make better decisions by knowing what the weather and climate is likely to be (enabling them to make better crop choices or alter planting times in farming, for example). We estimate that this will save over £190 million in terms of avoided damage to health, homes, livelihoods and infrastructure between now and 2030. The WISER programme will initially benefit the East African fishing and farming communities, as well as a wide range of African people, including young, old, men and boys and women and girls.
Rural Electrification in Sierra Leone	5.9	7.93	Committed	ODA	grant	Mitigation	Energy distribution	Sierra Leone – "To increase access to clean energy through the creation of environmentally and economically sustainable electric mini-grid systems for small remote rural communities in Sierra Leone by 2020. This is expected to directly benefit around 360,000 people in rural Sierra Leone, and indirectly help up to 1.8 million people access low carbon electricity. This will add more than 10 Mega Watts (MW) to the country's power generation capacity of an estimated average peak demand requirement of 300-500 MW. There will be a welfare increase in rural communities in terms of saved fuel costs, improved health and education outcomes, improved communications and access to information and health and safety. The project will also result in a significant reduction in Sierra Leone's future Green House Gas emissions through supported private investment in the installation and operation of renewably-powered mini-grids'".
Building Resilience Through Asset Creation and Enhancement II – South Sudan (ICF Programme)	5.8	7.77	Committed	ODA	grant	Adaptation	Agriculture	South Sudan – To reduce hunger gaps, improve long-term food security and mitigate conflict among 400,000 rural poor in five states of South Sudan. By working together beneficiaries earn food or cash in return for identifying and building community assets (such as irrigation ponds). This enables communities to develop and manage their resources against extreme climate damage and shocks. This will contribute to Sustainable Development Goals 1, 2, 13, 15 and 16 to end poverty and hunger; take action on climate; protect life on land and; promote peaceful and inclusive societies for sustainable development.
Zimbabwe Resilience Building Fund Programme(ZRBF)	4.6	6.19	Committed	ODA	grant	Adaptation	General Environment Protection	Zimbabwe – To improve the resilience capacity of households affected by climatic shocks and trends through inclusive economic development. The programme will have a risk financing mechanism to make timely, appropriate and predictable funding available for communities that experience large scale humanitarian shocks. The program will also build evidence to improve the policy environment and stimulate service provision to enhance household and community resilience.
Zimbabwe Resilience Building Fund Programme(ZRBF)	1.2	1.55	Committed	ODA	grant	Mitigation		
Green Mini-Grids Kenya	5.0	6.67	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Kenya – Support for project preparation and leveraging of private investment in Green Mini-Grids (GMGs) in Kenya.
Productive Social Safety Net Programme	5.0	6.67	Committed	ODA	grant	Adaptation	Other Social Infrastructure & Services	Tanzania – To support the scale up of the Productive Social Safety Net which will reach 1 million households, and these households are the poorest 15%. through the provision of conditional Cash Transfers, Green Public Works and Livelihood Enhancement. This programme will aim to improve the opportunities available to the poorest communities by reducing the depth of income poverty, improving food consumption and increasing their resilience to climate-related shocks. DFID will also support central government to develop and strengthen systems and institutions to deliver more comprehensive social protection provision that can respond to any future economic, food or climate shocks in Tanzania.
Humanitarian Response in Mozambique	5.0	6.62	Committed	ODA	grant	Adaptation	Emergency Response	Mozambique – To improve the long term needs of the people of Mozambique to the impact of drought exacerbated by the El Nino. This project will improve poor people access to a wide range of essential services in the short and long term including clean water, access to food (short and long term) and livelihoods. The programme will improve the sustainability of farmers to protect their crops against drought.

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Water, Environmental Sanitation and Hygiene Programme	4.9	6.60	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Sierra Leone – To provide sanitation and hygiene services in Freetown. Establishing and expanding sustainable waste management services in three large towns and improving water, sanitation and hygiene services in rural areas and in two small towns. Includes increasing water security and building resilience to future water scarcity as a result of climate change.
Multi-Year Humanitarian Support to Afghanistan	4.3	5.77	Committed	ODA	grant	Adaptation	Disaster Prevention & Preparedness	Afghanistan – To provide support to the most vulnerable groups in Afghanistan to have access to timely, appropriate and cost-effective humanitarian aid, have fewer life-critical needs, build the capacity of communities to mitigate the risk of natural disasters, including climate risk mitigation, and to better respond to these events when they occur.
Multi-Year Humanitarian Support to Afghanistan	0.5	0.64	Committed	ODA	grant	Mitigation		
Promoting Conservation Agriculture in Zambia	3.2	4.27	Committed	ODA	grant	Adaptation	Agriculture	Zambia – To raise agricultural productivity in Zambia, particularly small scale farmers, using climate smart agriculture techniques and facilitating commercial relationships with agriculture companies.
Promoting Conservation Agriculture in Zambia	1.4	1.83	Committed	ODA	grant	Mitigation		
The Water Security Programme	4.3	5.79	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Centrally Managed – 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, World Bank Water Partnership Programme and GIZ International Water Stewardship Programme to support increased investment in the information, institutions and infrastructure required to deliver water security.
CONGO – Improving Livelihoods and Land Use in Congo Basin Forests	2.0	2.63	Committed	ODA	grant	Adaptation	Forestry	Africa Regional – To improve the the livelihoods of forest dependent communities and reduce deforestation in the Congo Basin by providing support to forest zoning, independent forest monitoring, civil society advocacy and the strengthening of legal frameworks for community forestry, as well as direct investments in community forest enterprises. The programme is expected to benefit 2.4million beneficiaries (direct and indirect). The programme will also have a demonstration effect, building a body of evidence on Community Forestry in the Congo Basin.
CONGO – Improving Livelihoods and Land Use in Congo Basin Forests	2.0	2.63	Committed	ODA	grant	Mitigation		
Building Resilience and adapting to climate change in Malawi	3.9	5.22	Committed	ODA	grant	Adaptation	Other Social Infrastructure & Services	Malawi – This programme aims to strengthen the resilience of poor households in Malawi to withstand current and projected weather and climate-related shocks and stresses. This will in turn halt the annual cycle of humanitarian crises that blights people's lives, harms poverty reduction efforts and swallows up resources. The UK will invest up to £70 million over five years (2018-2023) to provide direct benefits to 1.7 million poor and vulnerable people in Malawi (approximately 300,000 households).
Building Urban Resilience to Climate Change in Tanzania	3.9	5.15	Committed	ODA	grant	Adaptation	Urban development and management	Tanzania – To build urban resilience to current climate variability and future climate change in Tanzania's cities and towns through improved data and evidence, urban planning, and infrastructure provision for sustainable economic growth and development.
On and off Grid Small Scale Renewable Energy in Uganda	3.7	4.95	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Uganda – To improve the environment for private investment in Uganda's renewable energy sector by accelerating the market for off grid solar energy and supporting the construction of at least 15 on-grid small scale power plants. This will increase Uganda's energy production by approximately 20%, improve access to clean and modern energy for over 200,000 households and businesses or 1.2m people; mobilise up to £240 million in 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 MtCO2e.
Climate Smart Development for Nepal	1.7	2.31	Committed	ODA	grant	Adaptation	Government & Civil Society	Nepal – This will help Nepal to cope with impacts of climate change (CC) and promote clean development. It will provide strategic support to the Govt of Nepal to design and implement CC policies, to integrate resilience throughout government planning. This will:Improve resilience of 700,000 poor & vulnerable people (especially women) to floods, landslides, droughts in most remote districts;Improve resilience of businesses in 5 growing urban centres & 3 river basins through investments in urban planning, large scale irrigation systems & flood management;Facilitate connection of over 25,000 households to new micro-hydro power installations; connect over 70,000 homes to solar power & install RET in more than 200 schools/health clinics;Develop industry standard for 'clean' brick production and enable over half of the brick kilns (at least 400) to adopt more efficient technologies;Improve design of future CC programming & beyond through generation of world class evidence
Climate Smart Development for Nepal	1.7	2.31	Committed	ODA	grant	Mitigation		

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I2I – Ideas to Impact – Testing new technologies and innovative approaches to address development challenges.	1.9	2.49	Committed	ODA	grant	Mitigation	Industry	Centrally Managed – I2I stimulates technological innovations addressing intractable development challenges, initially in the focal areas of energy, water and climate, and then increasingly in emerging "frontier" technologies with broader applicability. It tests different funding mechanisms and approaches – including prizes, peer-to-peer financing, Frontier Technology Livestreaming, and innovative cross-government partnerships – for ensuring technology ideas lead to a real-world development impact.
I2I – Ideas to Impact – Testing new technologies and innovative approaches to address development challenges.	1.5	2.04	Committed	ODA	grant	Adaptation		
Rural Water for Sudan (RW4S)	3.4	4.48	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Sudan – This programme will address the root causes of crisis in Darfur by tackling one of the main drivers of local conflict and poverty – availability of water. Water is scarce and there is competition over its use. This can result in conflict and lead to unsustainable livelihoods, forcing people to migrate to find alternatives. The climate is likely to get hotter and drier, further increasing scarcity of water. The programme will increase the availability of water for drinking and livelihoods for 250,000 people, and will support communities to sustainably manage their water resources for the benefit of all users. This will increase communities' resilience to the impacts of drought, contributing to more sustainable livelihoods and reducing the risk of conflict, overall improving stability in Darfur and reducing the pressure to migrate. In addition, the programme will improve sanitation and hygiene behaviour, improving the health and well-being of communities. 80% ICF funding.
Pacific Catastrophe Risk Assessment and Financing Initiative	3.3	4.39	Committed	ODA	grant	Adaptation	Banking & Financial Services	Asia Regional – To provide technical assistance and capital to provide insurance for the Pacific Islands so in future they can protect themselves against natural disasters such as cyclones and Tsunamis thereby reducing their reliance on humanitarian aid. The nations of Tonga, Marshall islands, Cook Islands, Vanuatu, and Samoa (625,000 people in total) will benefit from the insurance at the start of the programme.
Khyber Pukhtunkhwa Education Sector Programme	3.2	4.29	Committed	ODA	grant	Mitigation	Basic Education	Pakistan – To improve primary and secondary education in Khyber Pakhtunkhwa by providing up to £283.2million in technical assistance, financial aid and infrastructure which aims to benefit all primary and lower secondary children in the province by 2020. Infrastucture will aim to have a lower carbon footprint and be sited away from flood prone areas. This programme targets primary enrolment specifically girl child enrolment and female literacy which contributes towards Millennium Development Goals 2 and 3.
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	1.7	2.31	Committed	ODA	grant	Adaptation	Industry	Kenya – 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). Enabling this change will require targeted support to critical aspects of climate change governance, and stimulation of civil society demand. This contributes to the UK Government's International Climate Fund (ICF) commitments and will benefit 828,000 people able to cope with the effects of climate change and 17,600 people with improved access to clean energy.
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	1.4	1.88	Committed	ODA	grant	Mitigation		
Provision of finance to the Rwanda Fund for Climate Change and Environment	2.3	3.09	Committed	ODA	grant	Adaptation	Agriculture	Rwanda – 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. This will benefit 15 000 people to cope better with climate change impacts, 2000 people gain access to clean energy especially in rural areas, protect 1200 hectares of land against soil erosion, create 2000 green jobs as well as mobilise £8 million of additional finance from the private sector by July 2015. This contributes towards the MDG on environmental sustainability and ensuring an effective response to the impacts of climate change, thus securing current and future development gains as well as protection of the livelihoods of the poorest people.
Provision of finance to the Rwanda Fund for Climate Change and Environment	0.8	1.03	Committed	ODA	grant	Mitigation		
Supporting Structural Reform in the Indian Power Sector	3.1	4.08	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	India – In line with the UK government's aid policy and new development partnership with India, the 'Supporting Structural Reform in the Indian Power Sector' programme will improve the efficiency, reliability and sustainability of electricity supply in India through technical expertise, not through traditional grant support. It will provide world class expertise to support the market reforms and scale up of renewable energy supply that the Indian power sector needs to support growth and create jobs. It will work at the Central level and in upto three States which may include DFID focus states such as Odisha, Andhra Pradesh and Madhya Pradesh.
Global Network of Climate Technology Innovation Centres	1.5	2.00	Committed	ODA	grant	Adaptation	Energy generation, renewable sources	Centrally Managed – The purpose is to build a global community of practice of entrepreneurs and innovators dedicated to develop and deploy climate smart technologies providing clean, safe, reliable and sustainable access to energy, water and other natural resources to poor communities in developing countries.
Global Network of Climate Technology Innovation Centres	1.5	2.00	Committed	ODA	grant	Mitigation		

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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*	
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Central Asia South Asia (CASA 1000) Electricity Transmission Project	3.0	4.00	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Asia Regional – Increased energy trade between Central Asia (initially Tajikistan and Kyrgyz Republic) and South Asia (initially Afghanistan and Pakistan) for improved energy services leads to improved productivity, private investment, regional trade, and pro-poor growth through access to jobs and services.
Support to improved water and sanitation in rural areas – Zimbabwe	2.3	3.09	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Zimbabwe – Contribute to the reduction of morbidity and mortality due to water, sanitation and hygiene related diseases. To reduce burden of water collection on women and girls; to improve basic education and gender equality. The programme target areas where effects of climate change and variability such as droughts and floods have affected community access to safe drinking water. Specifically, the programme is (i) Increasing the number of water sources in affected areas through rehabilitating and drilling high yielding and perennial water sources, (ii) Installing more energy efficient and clean solar powered Piped water systems with water storage facilities to ensure constant water supply and efficient water demand management during periods of water stress, (iii) Promoting water conservation through constructing waste water collection troughs at water points for livestock and (iv) Working with district water and sanitation technicians to construct climate resilient infrastructure.
Support to improved water and sanitation in rural areas – Zimbabwe	0.6	0.77	Committed	ODA	grant	Mitigation		
Rural Access Programme 3	2.9	3.86	Committed	ODA	grant	Adaptation	Transport & Storage	Nepal – To improve road access for 800,000 members of rural communities in the Western Region of Nepal, thereby improving economic opportunities and increasing access to markets and social services throughout the year. The project will lift 20,000 people out of poverty through access to work, skill trainings, and will promote equal opportunities for women. The project aims to contribute towards sustainable poverty reduction through investments in high value crops and will lay the foundations for private sector led development in the poorest region in the country. Climate variability and climate change are integrated in building new roads and maintaining existing roads through the programme.
Strengthening humanitarian preparedness and response in Bangladesh	2.8	3.79	Committed	ODA	grant	Adaptation	Emergency Response	Bangladesh – This programme will deliver improvement in disaster preparedness and response for large-scale catastrophic emergencies (e.g. earthquakes and cyclones) and recurrent, predictable events such as flooding as well as providing predictable support to Rohingya refugees and vulnerable refugee hosting communities.
Low Energy Inclusive Appliances	2.5	3.39	Committed	ODA	grant	Mitigation	Energy Policy	Centrally Managed – To undertake research to accelerate the availability, affordability, efficiency and performance of Low Energy Inclusive Appliances (LEIA) suited to developing country contexts. Domestic and small-industrial electrical appliances are key to increasing the impact of energy access for poor consumers, expanding the markets for household solar and mini-grid systems, and enabling the most efficient use of available power where the grid is unreliable."
Post-Earthquake Reconstruction in Nepal – Building Back Better	2.5	3.37	Committed	ODA	grant	Adaptation	Reconstruction Relief & Rehabilitation	Nepal – Establish partnerships with local & central government, communities and businesses to support the (i) districts effected by the Earthquake to "build back better" including leading to more resilient (including climate resilient) infrastructure and institutions; (ii) the most vulnerable recover their livelihoods and assets; and (iii) the Government of Nepal to plan for and manage the response to the earthquake.
Infrastructure for Climate Resilient Growth in India	2.5	3.33	Committed	ODA	grant	Adaptation	Rural development	India – In line with the UK government's aid policy and revised development partnership with India, the Infrastructure for Climate Resilient Growth (ICRG) programme sees the UK provide world class expertise to improve the impact of the Indian Government's $5 billion per year National Rural Employment Guarantee Scheme. The scheme will help over 5 million people living in three of India's poorest states – Odisha, Chhattisgarh and Bihar – to increase their incomes and resilience to climate shocks. It guarantees 40 million households per year the opportunity to build small scale works (irrigation, flood defences, forest plantations etc.) to increase their incomes and protect themselves from extreme weather events. UK support will improve the design and quality of infrastructure built, increase the capacity of the government to deliver its own programmes and influence the policies of the largest programme of this type in the world.
Asia Regional Resilience to a changing climate (ARRCC)	2.4	3.25	Committed	ODA	grant	Adaptation	General Environment Protection	Asia Regional – a regional partnership in South Asia among the research community, its funders, and users foster a more coordinated and interactive climate research environment that supports good decision making.
Increasing access to electricity in Sierra Leone	2.4	3.20	Committed	ODA	grant	Mitigation	Energy distribution	Sierra Leone – To increase access to improved, affordable and sustainable electricity supply for human development and wealth creation in Sierra Leone by 2018. through a combination of interventions supporting hard infrastructure, institutional reform and operational improvement.

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Support to the International Agriculture Research Centres developing and delivering agriculture technologies and knowledge to reduce poverty, hunger and adapt to climate change.	2.3	3.03	Committed	ODA	grant	Adaptation	Agriculture	Centrally Managed – To contribute to poverty reduction, improvements in nutritional status, and adaptation to climate change in South Asia and Africa in the face of climate change and resource scarcity, by developing new technologies, products and knowledge which promote agricultural productivity and increase the resistance of crops to diseases and pests. The programme will lead to increased agricultural productivity; increased production and consumption of nutritious vegetables; and improved food security and incomes for rural households in Africa and South Asia.
African Risk Capacity (ARC)	2.2	2.92	Committed	ODA	grant	Adaptation	Disaster Prevention & Preparedness	Centrally Managed – 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.
Supporting a Sustainable Future for Papua's Forests	1.6	2.15	Committed	ODA	grant	Mitigation	Forestry	Indonesia – To catalyse a number of urgent climate initiatives that will accelerate the transition to a low carbon economy and prevent planned deforestation in the Indonesian provinces of Papua.
Supporting a Sustainable Future for Papua's Forests	0.4	0.53	Committed	ODA	grant	Adaptation		
Green Economic Growth for Papua	2.0	2.61	Committed	ODA	grant	Mitigation	Forestry	Indonesia – The programme aims to promote green growth in Papua. It will contribute to the government of Papua's vision and spatial plan that intends to preserve 90 per cent forest cover in the province. In doing so the programme will support the provinces transition away from a high carbon business as usual growth trajectory onto a low carbon development pathway. The programme is designed to address the key barriers to private sector development in Papua that will enable firms to pursue low carbon business opportunities. It will work directly with firms, the financial sector, and the public sector to improve the commercial and environmental sustainability of small and medium sized enterprises. In addition, the programme will generate knowledge on how green growth can be implemented in Indonesia and globally.
Renewable Energy and Adaptation Climate Technologies (Africa Enterprise Challenge Fund)	1.0	1.28	Committed	ODA	grant	Adaptation	Energy distribution	Africa Regional – 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. Every business supported by REACT must demonstrate a positive impact on the rural poor through increased incomes, employment and productivity or by reducing costs.
Renewable Energy and Adaptation Climate Technologies (Africa Enterprise Challenge Fund)	1.0	1.28	Committed	ODA	grant	Mitigation		
Sustainable Energy for Women and Girls (SEWG)	1.3	1.77	Committed	ODA	grant	Mitigation	Energy Policy	Centrally Managed – Programme aims to shift clean energy markets and delivery systems towards improving the health, safety and economic opportunities of low income girls and women in developing countries, principally in DFID and International Climate Fund (ICF) priority countries in Africa.
Sustainable Energy for Women and Girls (SEWG)	0.6	0.76	Committed	ODA	grant	Adaptation		
Climate Smart Agriculture in Africa	1.2	1.63	Committed	ODA	grant	Adaptation	Agriculture	Africa Regional – Improved knowledge, policies and longer-term incentives to drive increased uptake of Climate Smart Agriculture (CSA) in Eastern and Southern Africa member states.
Climate Smart Agriculture in Africa	0.7	0.87	Committed	ODA	grant	Mitigation		
East Africa Geothermal Energy (EA-Geo)	1.6	2.13	Committed	ODA	grant	Mitigation	Energy Policy	Africa Regional – The programme aims to increase investment in geothermal energy in East Africa, contributing to economic development and growth, by addressing market failures which hinder the very early stages of geothermal market development, including: • reducing the risk of exploratory test drilling, leading to increased investor confidence in under exploited East Africa geothermal energy; and • improving geothermal strategy, policy and regulations that facilitate investment.
East Africa Geothermal Energy (EA-Geo)	0.2	0.23	Committed	ODA	grant	Adaptation		
Kenya Market Assistance Programme (MAP)	1.3	1.72	Committed	ODA	grant	Adaptation	Agriculture	Kenya – To reduce poverty in Kenya by enabling poor people to benefit from better functioning markets, including through mainstreaming climate resilience into market interventions, and by building greater awareness among influential decision makers of how markets can work better for the poor. This will increase household incomes of 148,000 small scale farmers and entrepreneurs – of whom 33% are women – by an average of over 20% by 2018. 36,000 jobs for women and 73,000 for men and male youth will also be created.
Kenya Market Assistance Programme (MAP)	0.4	0.57	Committed	ODA	grant	Mitigation		
Centre for Disaster Protection (CDP)	1.7	2.27	Committed	ODA	grant	Adaptation	Banking & Financial Services	Centrally Managed – To protect poor and vulnerable people, save lives and help developing countries to get back on their feet more quickly after a disaster by working with governments to strengthen planning, embed early action, and use "risk financing" tools like insurance and contingent credit to finance more cost-effective, rapid and reliable response to emergencies. It aims to empower governments to build resilience to natural disasters and climate change, and take ownership of their risks, with more assistance delivered through pre-financed government-led systems.

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Regional Vulnerability Assessment and Analysis Programme	1.7	2.24	Committed	ODA	grant	Adaptation	General Environment Protection	Africa Regional – Supporting countries in the Southern Africa Development Community to measure vulnerability to climate change and use this to inform and strengthen emergency and development responses.
African Agriculture Technology Foundation (AATF) Phase III (2015-2020)	1.7	2.23	Committed	ODA	grant	Adaptation	Agriculture	Centrally Managed – The expected impact of support to the proposed intervention is increased productivity of small-holder farmers in Sub-Saharan Africa, including scaling up of crops resilient to climate shocks such as drought. This impact will be achieved through two outcomes a. Increased access/availability of appropriate agricultural technologies for small-holder farmers in targeted countries in Sub-Saharan Africa. b. A financially sustainable organisation/mechanism that is responsive to the needs of small-holder farmers in ensuring that market failures in the development and adoption of appropriate agricultural technologies continue to be addressed.
Providing Clean Energy to the Rural Poor of Bangladesh	1.7	2.22	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Bangladesh – Climate change mitigation and access to clean energy to improve the livelihoods of rural poor in off- grid areas in Bangladesh.
Sustainable Urban Economic Development Programme (SUED)	0.9	1.20	Committed	ODA	grant	Adaptation	Urban development and management	Kenya – DFID is supporting emerging urban centres in Kenya to put in place sustainable urban economic plans; improve the investment climate and draw in investment for key climate-resilient infrastructure and value chain projects. This will include integrating digital technologies to build 'smart' towns/cities that improve the quality and performance of urban services and enable a better quality of life.
Sustainable Urban Economic Development Programme (SUED)	0.6	0.80	Committed	ODA	grant	Mitigation		
Delivering climate resilient Water, Sanitation and Hygiene in Africa and Asia	1.5	2.00	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Centrally Managed – The proposed programme will allow us to respond effectively to identified needs and to demonstrate to other funders the types of infrastructural and management interventions that build resilience.
Improving Market Systems for Agriculture in Rwanda (IMSAR)	1.4	1.89	Committed	ODA	grant	Adaptation	Agriculture	Rwanda – IMSAR will commercialise agriculture through improving the way agricultural market systems function. It will identify market failures and provide the necessary agricultural expertise and finance required to help address them. This will benefit the poor as producers, employees and consumers, and small and medium size business, resulting in increased sales among farmers and agro-enterprises, increase in the percentage of Rwandan agricultural produce that has value-added and an increase in export diversification. Given the strong link between income, income diversity, and the ability to adapt to the effects of climate change, IMSAR will help building poor households' resilience to current and future climate threats through improving access to input and output markets, increasing opportunities to diversify their production, and increasing non-farm income sources as an alternative to agriculture. This will help decreasing their sensitivity to climate change and improving their adaptive capacity.
Southern Agriculture Growth Corridor Programme in Tanzania	1.4	1.89	Committed	ODA	grant	Adaptation	Transport & Storage	Tanzania – To raise rural incomes and increase food security by contributing to the improvements in the business environment for commercial agriculture in Tanzania (especially the southern corridor), as well as growth in number and scale of commercial agribusinesses and substantial improvement in the market operations of a number of agricultural commodity markets. This includes ensuring infrastructure is climate resilient, such as no weather-related road closures. The programme is expected to benefit 100,000 rural households by March 2015 and over 230,000 households by end of the Programme in 2017.
Green Mini-Grids Africa Regional Facility for Market Preparation, Evidence and Policy Development	1.1	1.48	Committed	ODA	grant	Mitigation	Energy Policy	Africa Regional – The Green Mini-Grids programme aims to help transform the mini grid sector from a growing and sporadic series of pilot projects, to a thriving industry. Work includes development of small-scale electricity generation which serves a limited number of consumers via a distribution grid that can operate in isolation from national electricity transmission network. Transformation is to be achieved through the creation of a critical mass of experience and evidence of success in two countries (Kenya and Tanzania), coupled with improved policy and market conditions for investments regionally.
Green Mini-Grids Africa Regional Facility for Market Preparation, Evidence and Policy Development	0.3	0.36	Committed	ODA	grant	Adaptation		
Transparency and Right to Information	1.3	1.80	Committed	ODA	grant	Adaptation	Government & Civil Society	Bangladesh – To increase transparency and accountability in Bangladesh by improving systems for management and proactive publication of official information that is relevant and accessible, timely and accurate, and by enabling state reformers, businesses and social activists to hold officials and decision makers answerable for their actions across a range of services including health, education, local government, climate finance and land administration.

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Kenya Devolution Support Programme	0.9	1.21	Committed	ODA	grant	Adaptation	Government & Civil Society	Kenya – The Kenyan Constitution, adopted by referendum in 2010, introduced far reaching devolution to 47 newly-established counties. Hopes are high that devolution will improve accountability and service delivery and contribute to poverty reduction. The purpose of this programme is to build and improve public services for Kenyan citizens, particularly focusing at the county level where poverty exists and where public service delivery is poor. The programme will improve the ability of county governments to better plan, deliver and monitor the delivery of public services. This includes working with county governments to strengthen public financial management systems (e.g. improving accounting, audit and procurement systems) to ensure that public money is effectively spent and can be accounted for. It also includes a focus on critical services for example health and natural resource management (such as water scarcity due to climate change). The programme will help county governments to improve planning and allocation of budgets.
Kenya Devolution Support Programme	0.4	0.52	Committed	ODA	grant	Mitigation		
Adapt Environmental and Climate Resilience in Sudan	1.3	1.68	Committed	ODA	grant	Adaptation	General Environment Protection	Sudan – To increase understanding and integration of climate resilience and environmental management into delivery, plans and policy in Sudan. 100% ICF Funding.
Pakistan National Cash Transfers Programme	1.2	1.65	Committed	ODA	grant	Adaptation	Other Social Infrastructure & Services	Pakistan – To reduce poverty and improve living standards and educational attainment in the poorest families by providing regular payments to the female head of household. This includes reducing vulnerability to shocks such as flooding due to climate change. 315,000 additional beneficiary families will benefit by 2020. This programme will contribute to 1.05 million primary school children being supported in school and directly contribute to Millennium Development Goals 1: Eradicating extreme poverty and hunger; and Millennium Development Goals 2: Achieve universal primary education.
Deepening Democracy Programme	0.9	1.13	Committed	ODA	grant	Adaptation	Government & Civil Society	Kenya – To improve the Kenyan Government's accountability to its citizens by delivering peaceful, transparent, inclusive elections and providing support to non-governmental organisations, oversight bodies and independent commissions that can influence and deliver reforms thereby supporting the goal of making Kenya a more stable democracy. The project aims to improve county government planning, budgeting, human resource management, results, performance management and citizen engagement. In each of these areas, UK support will focus on governance, health, climate change and local economic development.
Deepening Democracy Programme	0.4	0.48	Committed	ODA	grant	Mitigation		
Cities and Infrastructure for Growth (CIG)	1.2	1.60	Committed	ODA	grant	Mitigation	Energy Policy	Centrally Managed – The UK will provide up to £165m over 5 years in two phases of £82.5m. The programme will provide technical support on city and regional interventions in 3 focus countries, Burma, Uganda and Zambia resulting in increased inclusive economic growth and job creation. The interventions will help city economies to become more productive, deliver access to reliable, affordable, renewable power for businesses and households, and strengthen investment into infrastructure services, including from the UK.
Market Development in Northern Ghana	1.2	1.57	Committed	ODA	grant	Adaptation	Agriculture	Ghana – To improve incomes and increase resilience of poor farmers and small-scale rural entrepreneurs in Northern Ghana.
South Asia Water Governance Programme (SAWGP)	1.2	1.56	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Asia Regional – 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.
UK-INDIA Partnership on National Investment and Infrastructure Fund -Green Growth Equity Fund	1.2	1.55	Committed	ODA	equity	Mitigation	Energy generation, renewable sources	India – The NIIF sub-fund will use UK government finance to catalyse private sector investments from global UK investors, through the City of London to infrastructure projects in India. To help India address a key constraint to inclusive growth by boosting investment into infrastructure – which will lead to growth, job creation and poverty reduction in India. The fund is fully attributed to climate change mitigation – ie low carbon development, reducing greenhouse gas emissions. The fund will primarily invest in sectors like Renewable Energy, Clean Transportation, Water Treatment, and Waste Management. The success of this intervention will lead to follow on private investment that will have a transformational impact on India's economic development.
Strengthening disaster resilience in Nepal	1.2	1.54	Committed	ODA	grant	Adaptation	Disaster Prevention & Preparedness	Nepal – This project will strengthen disaster resilience in Nepal, particularly to earthquakes, by working with urban centres to build and plan more safely; supporting the strengthening of critical public infrastructure to earthquakes; working to strengthen national capacity to respond to crises and ensure that the international community is prepared; and ensuring that the UK is able to support a humanitarian response should a crises hit. TMEA will strengthen climate resilience by supporting climate-smart infrastructure development and expo.

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Support to Trademark East Africa Rwanda (TMEA) Rwanda Country Programme – Strategy II	0.7	0.89	Committed	ODA	grant	Mitigation	Trade Policies & Regulations	TMEA will strengthen climate resilience by supporting climate-smart infrastructure development and export diversification, with approximately 30% of programme spend contributing to our International Climate Fund (ICF) target. Examples include supporting the government and private sector to develop more efficient – and climate resilient – port infrastructure that saves energy and reduces emissions, at the same time as increasing trade flows; creation of logistics hubs in secondary cities, reducing inefficient empty backhaul truck journeys, so reducing average emissions per tonne-km transported; and supporting better data on trade-related carbon emissions gathered through our ICT4 trade programme.
Support to Trademark East Africa Rwanda (TMEA) Rwanda Country Programme – Strategy II	0.5	0.60	Committed	ODA	grant	Adaptation		
Accelerating Investment and Infrastructure in Nepal	1.1	1.48	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Nepal – To accelerate private investment and economic growth in Nepal by providing technical expertise to help Nepalese institutions develop major infrastructure (including renewable energy); improve the business climate for domestic and foreign investors; improve the implementation of economic policy and test new approaches for local economic development. This will result in at least £600 million of private investment into growth-boosting sectors and a reduction by at least 10% in time or cost for at least five regulatory processes perceived as burdensome by the private sector.
Sustainable Crop Production Research for International Development (SCPRID)	1.1	1.47	Committed	ODA	grant	Adaptation	Agriculture	Centrally Managed – The purpose of the project is to develop new science and technology to support the development of new crop varieties with more resistance and less vulnerability to biotic and abiotic shocks which will result from new and emerging crop pests and diseases, climate change and water stress.
Support to Bangladesh's National Urban Poverty Reduction Programme (NUPRP)	1.0	1.27	Committed	ODA	grant	Adaptation	Urban development and management	Bangladesh – Improvement in the integration of poor communities into municipal planning, budgeting and management, with a particular focus on women and girls and climate resilience; piloting of options for scale up and lesson learning at national level to inform overall urban policy and poverty reduction.
Support to Bangladesh's National Urban Poverty Reduction Programme (NUPRP)	0.1	0.13	Committed	ODA	grant	Mitigation		
Poorest States Inclusive Growth Programme	1.0	1.32	Committed	ODA	grant	Mitigation	Banking & Financial Services	India – To enhance economic value generated for the poor as producers, consumers and employees by investing in impact enterprises including clean energy. This will benefit up to 30 enterprises and generate employment incomes of at least £10m.To ensure poor and vulnerable people in low income states (especially women) benefit from economic growth through better access to financial services, and investing in private sector projects that will benefit the poor as producers, consumers and employers. This will benefit 12 million low income households with improved access to financial services and up to 30 enterprises in attracting additional investments worth £56 million.
Climatescope – Clean Energy Investment Index	1.0	1.30	Committed	ODA	grant	Mitigation	Energy Policy	Centrally Managed – To increase private investment in renewable energy projects in developing countries by providing investors with comparable and robust policy and market information in an easily accesible data tool. Renewable energy is becoming a cheaper solution than fossil fuels in many developing countries and by providing better information to potential investors, Climatescope supports increasing investment in renewable energy in developing countries. This in turn will support economic growth through greater access to sustainable energy and allow businesses to prosper.
Energy Security and Resource Efficiency in Somaliland	0.7	0.97	Committed	ODA	grant	Adaptation	Energy generation, renewable sources	Somalia – To support Somaliland in diversifying its energy mix, enhancing resilience and facilitating an enabling institutional and regulatory environment for the expansion of access to electricity.
Energy Security and Resource Efficiency in Somaliland	0.2	0.24	Committed	ODA	grant	Mitigation		
Monitoring , Evaluation and Learning from the International Climate Fund	0.5	0.60	Committed	ODA	grant	Adaptation	General Environment Protection	Centrally Managed – 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.
Monitoring , Evaluation and Learning from the International Climate Fund	0.5	0.60	Committed	ODA	grant	Mitigation		
Assisting Public Institutions and Markets to Become Resilient to Effects of Climate Change in Tanzania (AIM for Resilience)	0.9	1.13	Committed	ODA	grant	Adaptation	Government & Civil Society	Tanzania – To enable the poorest and most vulnerable in Tanzanian society to become more resilient to climate change and to benefit from low carbon growth through the strengthening of the United Republic of Tanzania Public sector institutions to implement the national climate change strategy and adaptation plans. The programme will also support relevant sector Ministries to implement their sector resilience plans; support to building the capacity of the Tanzania Meteorological Agency to provide meteorological data management and providing efficient services to its customers; and seek to develop sustainable private sector markets. This programme is a central element of the UK International Climate Fund portfolio in Tanzania and will help maximise the return from the wider investments.
Assisting Public Institutions and Markets to Become Resilient to Effects of Climate Change in Tanzania (AIM for Resilience)	0.0	0.05	Committed	ODA	grant	Mitigation		

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Support for Protection and Assistance of Refugees in Kenya (SPARK)	0.8	1.06	Committed	ODA	grant	Mitigation	Emergency Response	Kenya – To improve the efficiency in delivery of basic services to refugees (including developing or rehabilitating climate-smart camp infrastructure) and to strengthen their resilience and that of the communities hosting them. This will be achieved through targeted assistance and greater use of cash-based assistance. This programme will assist adolescent girls and women of reproductive age and malnourished children under 5 years of age through nutritional interventions as well as ensuring that the survivors of sexual and gender based violence (SGBV) receive appropriate medical care in a timely manner. The project will also assist 8,000 refugees with livelihoods opportunities , including climate smart opportunities such as processing solid waste for onselling or producing energy-efficient stoves, and will support the voluntarily return of refugees to their countries of origin.
Economics of Low Carbon Development for Indonesia	0.4	0.48	Committed	ODA	grant	Adaptation	General Environment Protection	Indonesia – To contribute to national debate on economic costs and benefits of unilateral and regional actions on mitigation and adaptation; to raise awareness about the urgency of climate change challenges and their potential socioeconomic impact on Indonesia, while informing other stakeholders (e.g., civil society, academia, media, nongovernment organizations, private sector, and aid agencies) of the same; and to indirectly support government and private sector actions in Indonesia to mitigate and adapt to climate change.
Economics of Low Carbon Development for Indonesia	0.4	0.48	Committed	ODA	grant	Mitigation		
ESPA – Eco System Services for Poverty Alleviation	0.5	0.71	Committed	ODA	grant	Adaptation	General Environment Protection	Centrally Managed – To understand why ecosystems are becoming degraded, including as a result of climate change, 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.
ESPA – Eco System Services for Poverty Alleviation	0.1	0.17	Committed	ODA	grant	Mitigation		
Corridors for Growth	0.4	0.56	Committed	ODA	grant	Adaptation	Transport & Storage	Tanzania – To increase Tanzania's infrastructure for trade in three ways (i) Co-financing the Dar Port eTanzania – To increase Tanzania's infrastructure for trade in three ways (i) Co-financing the Dar Port expansion together with the World Bank and Tanzania Port Authority will double port capacity and enable Tanzania's entire trade volume to increase by two thirds. (ii) Project preparation funding for six more major regional transport projects are expected to catalyse up to £600m of development finance incorporating climate resilent design. (iii) Launching a new approach to Public-Private Partnerships will improve infrastructure in municipal areas and build capacity for larger PPP's in the future.The programme is expected to reduce the costs of doing business in Tanzania, contributing to growth, more jobs and lower poverty. The short-term beneficiaries will be users such as traders, logistics providers and public citizens. International business including from the UK will benefit from better access to trade. In the medium to long run employment is expected to increase from indirect effects.
Corridors for Growth	0.2	0.28	Committed	ODA	grant	Mitigation		
Water for Three States (Red Sea, Gadarif and Kassala)	0.6	0.84	Committed	ODA	grant	Adaptation	Water Supply & Sanitation	Sudan – To provide the people of Eastern Sudan with access to sustainable clean drinking water sources, improved sanitation facilities, and hygiene promotion by 2018. This will be achieved by implementing water and sanitation projects in selected rural areas of Gadaref, Kassala and Red Sea States and by designing a comprehensive and feasible plan for rehabilitation and expansion of Port Sudan water and sanitation systems. The programme contributes to the seventh Millennium Development Goal that is to ensure environmental sustainability by reducing the proportion of people without sustainable access to safe drinking water and basic sanitation. 40% ICF funding.
Karamoja Nutrition Programme (KNP)	0.6	0.84	Committed	ODA	grant	Adaptation	Health, General	Uganda – The Karamoja Nutrition Programme will deliver services to treat acute malnutrition; strengthen health service planning and delivery; improve access to supplements that prevent micronutrient deficiencies for mothers and children; and test and scale initiatives to prevent malnutrition in Karamoja – including through crop bio-fortification. It will strengthen climate resilience through operation & maintenance of water supply and sanitation systems in selected health centers in the semi- arid region of Karamoja Uganda.
Infrastructure and Cities for Economic Development (ICED)	0.3	0.39	Committed	ODA	grant	Adaptation	Urban development and management	Centrally Managed – To improve the enabling environment for sustainable, inclusive growth-enhancing infrastructure service delivery in DFID focus countries; and, Harness the benefits of cities for sustainable economic growth and poverty reduction in DFID focus countries. The ICED programme can help DFID to deliver low carbon growth and resilient economic growth which sustainably manage our natural resources.
Infrastructure and Cities for Economic Development (ICED)	0.3	0.39	Committed	ODA	grant	Mitigation		
Research Programme Consortium on Leveraging Agriculture for Nutrition in South Asia (LANSA)	0.6	0.76	Committed	ODA	grant	Adaptation	Health, General	Centrally Managed – The purpose of this research programme is to answer the question "how can South Asian agriculture and related food security policies and interventions best be designed and implemented to increase their impacts on nutrition, especially the nutrition status of children and adolescent girls"?

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Humanitarian Innovation and Evidence Programme: greater use of evidence and innovation in humanitarian responses	0.6	0.74	Committed	ODA	grant	Mitigation	Research/scientific institutions	Centrally Managed – This is business case 2/3 which implements the DFID Humanitarian Innovation and Evidence Strategy. This programme will develop and test innovative approaches to humanitarian practice; provide evidence of the cost effectiveness of investments in disaster risk reduction; provide new evidence on the scaling up of cash-based approaches; support better evidence on insurance as a risk management tool; and create new evidence on the best intervention to improve health and nutrition in emergencies.This is one of three business cases which implements the DFID Humanitarian Innovation and Evidence Strategy. Between 2000-2009, more than 2.2 billion people were affected by 4,484 natural disasters. Vulnerability to hazards is increasing as a result of demographic, political and environmental changes. Demand for humanitarian assistance is likely to rise while economic constraints are also increasing. In this context it is important to ensure that the most effective and cost efficient approach.
Technical Assistance for Smart Cities (TASC)	0.3	0.41	Committed	ODA	grant	Mitigation	Urban development and management	India – To enhance the potential of Indian cities in poorer and developing states such as Madhya Pradesh, Bihar, Andhra Pradesh, Odisha, Maharashtra to promote growth and jobs creation. UK support will achieve this by developing partnerships with UK urban planning, research and business organisations to help India cities develop investment plans, attract finance and deliver smart urban solutions that create jobs for the urban poor. Activities including climate resilient infrastructure, climate and disaster risk insurance, renewable energy and water management.
Technical Assistance for Smart Cities (TASC)	0.2	0.27	Committed	ODA	grant	Adaptation		
Khyber Pakhtunkhwa Merged Districts (KPMD) Support Programme (previously called the Federally Administered Tribal Areas (FATA) Development Programme)	0.5	0.67	Committed	ODA	grant	Adaptation	Conflict, Peace & Security	Pakistan – The programme will work on the Basic Heath, Education, Rule of law, Civilian Peace-Building, Conflict Prevention and Resolution, Public Sector Financial Management, climate change elements and Economic and Development Policy/Planning for the Tribal Districts of Khyber Pakhtunkhwa (previously called the Federally Administered Tribal Areas) in Pakistan.
Punjab Education Support Programme II	0.5	0.63	Committed	ODA	grant	Mitigation	Basic Education	Pakistan – To improve access, retention and the quality of education for all children in primary and secondary schools of Punjab Province in Pakistan. All government school children (6 million primary, 4 million secondary) and children attending school through the Punjab Education Foundation (around 2.2 million) will have benefited from UK support in Punjab by March 2019. Buildings will be sited and constructed in environmentally sound and climate resilient ways (such as to build resilient to floods), testing new approaches including using climate-friendly local materials.
Strengthening Economic Systems in Bangladesh	0.2	0.29	Committed	ODA	grant	Adaptation	Government & Civil Society	Bangladesh – To increase the dialogue on economic reforms, and support the Government of Bangladesh to make more pro-poor economic policies, including building evidence on the macro-economic impact of climate change and the economic impact of climate-induced migration.
Strengthening Economic Systems in Bangladesh	0.2	0.29	Committed	ODA	grant	Mitigation		
Bihar Agriculture Growth and Reform Initiative (BAGRI)	0.4	0.48	Committed	ODA	grant	Adaptation	Agriculture	India – To significantly improve the performance of the agriculture sector in Bihar by improving access to markets for identified agriculture and horticulture products, access to finance, knowledge and technology, and institutional capacity for market regulation and support farmers in building resilience to the impacts of climate change such as drought and flooding. This will reflect higher private sector investment, higher production and higher price realisation by 1,00,000 farmers.
Programme of Support to Agriculture in Rwanda	0.3	0.41	Committed	ODA	grant	Adaptation	Agriculture	Rwanda – 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. The programme will build resilience to climate variability and improve sustainable management of agricultural land by increasing soil erosion control, small scale irrigation and strengthening sustainability and resilience strategies. The programme will result in increased agricultural productivity, food security and incomes of poor households and contributes towards the MDG's by helping to eradicate extreme poverty and hunger and; promoting gender equality and empowering women.
Programme of Support to Agriculture in Rwanda	0.0	0.04	Committed	ODA	grant	Mitigation		
Sustainable Inclusive Livelihoods through Tea Production in Rwanda	0.4	0.47	Committed	ODA	grant	Adaptation	Trade Policies & Regulations	Rwanda – The project supports job creation and increased incomes by working with smallholder farmers to develop greenfield tea. The Wood Foundation Africa (TWFA) will set up and run two Services Companies supporting approximately 12,000 smallholder tea farmers over 7,500 hectares. Farmers will be supported to produce tea for the first time, employing best farming practices, including understanding and managing climate risk and variability.The Services Company will be co-owned by the farmers. This will lead to improved incomes and livelihoods (in particular nutrition and education) for the farmers and their families. Unilever and Luxmi will build a factory which will heavily rely on the tea supplied by the smallholder farmers with support from The Wood Foundation Africa.

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India: Affordable Housing in Poor States	0.3	0.46	Committed	ODA	grant	Mitigation	Urban development and management	India – The project, in partnership with National Housing Bank, will stimulate the growth of the affordable housing market by providing loans to build 17,000 housing units and 10,000 home loans for low income families. This will result in 27,000 construction jobs for the poorest people in low income states in India by 2020. This programme is predominantly in the form of Development Capital Investment, which generates a return to the UK. The technical assistance will support policy and system strengthening for the sector as well as promote innovative models and technologies. Appropriate choice of location will enhance resilience to climate shocks (flood, cyclone etc.) and disasters. Effective site planning and building envelope design, use of efficient building materials and construction practices, maximising the reuse and recycling of materials, and use of renewable resources can all help in reducing GHG emissions and environmental degradation.
Smart Urban Development in Indian States (SmUDI)	0.2	0.25	Committed	ODA	grant	Mitigation	Urban development and management	India – Provide UK support on urban governance, planning, finance and city partnerships to deliver Government of India's urban development programmes in select UK-India partner cities. The support will bring the best expertise from the UK to help create economically vibrant, safe and climate resilient cities in India.
Smart Urban Development in Indian States (SmUDI)	0.1	0.16	Committed	ODA	grant	Adaptation		
Climate Public Private Partnership Programme (CP3)	0.3	0.40	Committed	ODA	grant	Mitigation	Banking & Financial Services	Centrally Managed – 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 as pension funds and sovereign wealth funds into these areas by creating two commercial private equity funds of funds which will invest in subfunds and projects in developing countries, creating track records of investment performance which should in turn encourage further investments and accelerate the growth of investment in climate.
Decentralised Renewable Energy Access Markets (DREAM)	0.3	0.40	Committed	ODA	grant	Mitigation	Energy distribution	India – DREAM will help three of the poorest States in India provide energy to around 1.8m people. It will use UK expertise to mobilise public and private investment in sustainable and affordable energy supplies delivered by private energy businesses – creating 2000 jobs and supporting at least 200 women develop energy businesses.
Applied Research on Energy and Growth	0.2	0.29	Committed	ODA	grant	Mitigation	Energy Policy	Centrally Managed – Assisting policy makers in Low Income Countries to make better decisions about when, and how, to prioritise investment in high cost energy infrastructure. Through improved research and evidence on how to maximise the economic benefits of large scale energy projects, and a better understanding of how to bring the benefits of modern energy services to poorer people in those countries.
Applied Research on Energy and Growth	0.1	0.07	Committed	ODA	grant	Adaptation		
Adaptation for Smallholder Agricultural Programme (ASAP)	0.2	0.28	Committed	ODA	grant	Adaptation	Agriculture	Centrally Managed – To provide knowledge and best practices to help over 6 million smallholder farmers in up to 43 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; help farmers access markets to sell their crops; to plant trees on farms and introduce soil and water conservation practices; and, enable farmers to access daily and seasonal weather forecasts (e.g. using text messages) so they know when best to plant and harvest crops.
Adaptation for Smallholder Agricultural Programme (ASAP)	0.1	0.07	Committed	ODA	grant	Mitigation		
Sustainable Development of Mining in Rwanda (SDMR)	0.2	0.20	Committed	ODA	grant	Mitigation	Mineral Resources & Mining	Rwanda – SDMR aims to improve the livelihoods of over 40,000 Rwandans involved in the artisanal and small scale mining industry. Moreover, it will tackle Rwanda's growing trade deficit by increasing exports, help to attract much-needed private investment in the industry, and ultimately support Rwanda's path to economic transformation by creating more, higher paid, safer jobs for poor Rwandans. The outcome of the programme will be an economically, socially and environmentally sustainable ASM in target areas.This will contribute to the impact of an increased contribution of the mining sector to economic growth and improving livelihoods among ASM communities and improved management and operations of mines will reduce climate change related flooding and landslide risks.
Sustainable Development of Mining in Rwanda (SDMR)	0.0	0.03	Committed	ODA	grant	Adaptation		
NIAF 2 – Nigeria Infrastructure Advisory Facility Phase 2	0.1	0.11	Committed	ODA	grant	Adaptation	Urban development and management	Nigeria – To enhance the management of Nigeria's infrastructure development towards power sector reform, capital spending, repair and maintenance of roads, climate change adaptation and mitigation. This is expected to result to increased economic growth, job creation and contribute towards the MDGs by significantly reducing poverty for the majority of the Nigeria populace by year 2020.
NIAF 2 – Nigeria Infrastructure Advisory Facility Phase 2	0.1	0.11	Committed	ODA	grant	Mitigation		
Accountability in Tanzania Programme – Phase II	0.1	0.17	Committed	ODA	grant	Adaptation	Government & Civil Society	Tanzania – To empower Tanzanian citizens and strengthen civil society by providing grants and capacity building support to selected civil society organisations, to increase the accountability and responsiveness of government and the resilience of citizens to climate change. This contributes towards the Millenium Development Goals by ensuring Tanzanians are increasingly able to exercise their rights as citizens.
Accountability in Tanzania Programme – Phase II	0.0	0.05	Committed	ODA	grant	Mitigation		

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Carbon Market Finance for Africa (CMF-Africa)	0.1	0.15	Committed	ODA	grant	Mitigation	Energy distribution	Africa Regional – The project will transform the use of Clean Development Mechanism and other carbon market finance in Africa, for increased access to small scale, low carbon energy applications in rural areas. This will be through demonstrating the practical use and financial viability of innovative "standardised baselines" and new approaches to bundle small scale CDM projects (programmatic approaches).
Carbon Market Finance for Africa (CMF-Africa)	0.0	0.05	Committed	ODA	grant	Adaptation		
Managing Climate Risks for Urban Poor	0.1	0.16	Committed	ODA	grant	Adaptation	Urban development and management	Asia Regional – 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 in 25 medium-sized cities in 6 Asian countries (initially Pakistan, Bangladesh, India, Vietnam, Indonesia) by improving planning processes so that they consider climate change risks, for developing and funding new investment and infrastructure opportunities, and for knowledge and lesson sharing by 2018.
Stability and Growth Programme	0.1	0.10	Committed	ODA	grant	Mitigation	Government & Civil Society	Pakistan – To improve macro-economic stability and growth in Pakistan by providing the Government with financial aid and technical assistance in support of the International Monetary Fund Extended Financing Facility. Energy subsidy reforms under the EFF should contribute to increased investment in green energy and less waste and carbon emissions. This will benefit the people of Pakistan by establishing the conditions for faster and more equitable growth. This contributes towards our MDGs by enabling the Government of Pakistan to finance essential public expenditure and protect the poor from the adverse impact of structural reforms.
Results Based Financing for Low Carbon Energy Access	0.0	0.05	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Centrally Managed – 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. This is expected to benefit around 1.3m people by 2018, while reducing carbon emissions by around 260,000 Tonnes of carbon dioxide, through supported private investment in the installation and operation of over 110 renewably-powered mini-grids (figures to be updated after Business Case completion). Electricity access for lighting, communications and productive uses creates jobs, enables studying at night and enhances public services (such as clinics) and public safety (eg through streetlighting). This project also addresses the post-2015 High Level Panel's recommendation on a development goal entitled Secure Sustainable Energy, which includes energy access and renewable energy. The Results-Based Financing for Low Carbon Energy Access Programme aims to accelerate access to sustainable energy services in developing countries. The funding generates and tests different forms of Results-Based Financing (RBF) mechanism, which aim to stimulate decentralised energy markets and to leverage private investment to increase access to clean energy products and services.
Results Based Financing for Low Carbon Energy Access	0.0	0.05	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	Centrally Managed – 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. This is expected to benefit around 1.3m people by 2018, while reducing carbon emissions by around 260,000 Tonnes of carbon dioxide, through supported private investment in the installation and operation of over 110 renewably-powered mini-grids (figures to be updated after Business Case completion). Electricity access for lighting, communications and productive uses creates jobs, enables studying at night and enhances public services (such as clinics) and public safety (eg through streetlighting). This project also addresses the post-2015 High Level Panel's recommendation on a development goal entitled Secure Sustainable Energy, which includes energy access and renewable energy. The Results-Based Financing for Low Carbon Energy Access Programme aims to accelerate access to sustainable energy services in developing countries. The funding generates and tests different forms of Results-Based Financing (RBF) mechanism, which aim to stimulate decentralised energy markets and to leverage private investment to increase access to clean energy products and services.
Results Based Financing for Low Carbon Energy Access	0.0	0.01	Committed	ODA	grant	Adaptation		
Private Enterprise Programme in Zambia	0.0	0.05	Committed	ODA	grant	Mitigation	Industry	To create jobs and investment in Zambia by building the capacity of micro, small and medium enterprises, including for example those which use climate resilient technology or promote soil conservation. The programme will help to create over 26,500 jobs by 2019.
Private Enterprise Programme in Zambia	0.0	0.01	Committed	ODA	grant	Adaptation		
Rwanda Multi-Donor Civil Society Support Programme (2015-2021)	0.0	0.03	Committed	ODA	grant	Adaptation	Government & Civil Society	Rwanda – Strengthened civil society engagement on critical social cohesion, reconciliation and governance issues in Rwanda, prioritising four policy areas: (i) access to services amongst people with disabilities; (ii) sustainable agriculture; (iii) coordination of responses to gender-based violence (GBV); and (iv) promoting reconciliation in relation to the 1994 Genocide. DFID will provide funding and technical support to Rwandan civil society organisations to support the design and implementation of governance and reconciliation focused initiatives, and to support more effective engagement (influencing) with government on these issues.
Rwanda Multi-Donor Civil Society Support Programme (2015-2021)	0.0	0.03	Committed	ODA	grant	Mitigation		

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Zambia Health Systems Strengthening Programme	0.0	0.04	Committed	ODA	grant	Adaptation	Population Policies/ Programmes & Reproductive Health	Zambia – The Zambia Health Systems Strengthening programme aims improve the health of women and girls in Zambia across the continuum of care from birth, childhood and motherhood. This together with our other parallel interventions to strengthen the health system, will by 2021 result in a reduction in child and maternal deaths by 25% and 15% respectively and contribute towards attainment of the sustainable development goal for health. The nutrition status of 500,000 children, women and young girls will be improved and 270,000 girls and women gain access to family planning. It will ensure that Zambia is able to prevent, detect, and raise a comprehensive response to disease outbreaks and the effects of climate change.
International Forestry Knowledge (KnowFor)	0.0	0.01	Committed	ODA	grant	Adaptation	Forestry	Centrally Managed – Uptake of international forestry knowledge, evidence and tools for international forestry policy and practice.
International Forestry Knowledge (KnowFor)	0.0	0.01	Committed	ODA	grant	Mitigation		
Improving Energy Access in Tanzania through Green Mini-Grids	0.0	0.03	Committed	ODA	grant	Mitigation	Energy distribution	Tanzania – To improve access to clean, safe and reliable energy for Tanzanians, particularly the rural poor. This includes support for green mini-grids and technical assistance for energy access companies and project developers.
Building the capacity of the Caribbean Disaster Emergency Management Agency (CDEMA)	0.0	0.03	Committed	ODA	grant	Adaptation	Disaster Prevention & Preparedness	Caribbean – To provide operational support to the CDEMA coordinating unit and national disaster offices for strengthening procurement, contract and logistics management during emergencies.
PMEH – Pollution Management & Environmental Health	0.0	0.00	Committed	ODA	grant	Adaptation	General Environment Protection	Centrally Managed – Research programme focusing on pollution and reducing its harmful impacts on poor people. DFID funding will improve the current level of knowledge on the links between pollution, human health and livelihoods and associated economic impacts in developing countries. The research will contribute to the development of innovative environmental remediation techniques and technological solutions to reduce levels of air, water and soil pollution in developing countries and mitigate impacts on public health.
PMEH – Pollution Management & Environmental Health	0.0	0.00	Committed	ODA	grant	Mitigation		
Enhancing Community Resilience Programme	0.0	0.00	Committed	ODA	grant	Adaptation	Agriculture	Malawi – To achieve sustainable disaster-resilient communities through community-based best practices, public awareness and policy change.
Enhancing Community Resilience Programme	0.0	0.00	Committed	ODA	grant	Mitigation		
Negative ODA flow	-0.0	-0.00	Committed	ODA	grant	Adaptation	Population Policies/ Programmes & Reproductive Health	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	-0.0	-0.00	Committed	ODA	grant	Mitigation		
Negative ODA flow	-0.00	-0.00	Committed	ODA	grant	Adaptation	Energy Policy	
Negative ODA flow	-0.00	-0.00	Committed	ODA	grant	Mitigation		
Negative ODA flow	-0.0	-0.00	Committed	ODA	grant	Adaptation	Agriculture	
Negative ODA flow	-0.0	-0.00	Committed	ODA	grant	Mitigation		
Negative ODA flow	-0.0	-0.03	Committed	ODA	grant	Adaptation	Health, General	
Negative ODA flow	-0.0	-0.03	Committed	ODA	grant	Mitigation		
Negative ODA flow	-0.1	-0.08	Committed	ODA	grant	Adaptation	Agriculture	
Negative ODA flow	-0.2	-0.28	Committed	ODA	grant	Mitigation	Energy generation, renewable sources	
Negative ODA flow	-0.2	-0.21	Committed	ODA	grant	Mitigation	General Environment Protection	
Negative ODA flow	-0.2	-0.20	Committed	ODA	grant	Adaptation		
Negative ODA flow	-0.8	-1.05	Committed	ODA	grant	Mitigation	Energy distribution	
Negative ODA flow	-0.2	-0.25	Committed	ODA	grant	Adaptation		
UK Climate Investments	36.16	48.21	Committed	ODA	Equity	Mitigation	Energy generation, renewable sources	UK Climate Investments UKCI is a joint venture between the Green Investment Group (GIG) and the UK Government to invest in renewable energy and energy efficiency projects in developing countries.
Due diligence costs	0.59	0.79	Committed	ODA	Grant	Mitigation	Environmental policy and administrative management	Expenditure on external legal advice, evaluation and auditing services to support ODA spend.

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Administrative costs	1.98	2.64	Committed	ODA	Grant	Mitigation	Environmental policy and administrative management	ODA eligible costs associated with the management and delivery of programmes.
Partnerships for Forests	2.83	3.77	Committed	ODA	Grant	Mitigation	Forestry policy and administrative management	Partnerships for Forests catalyses investments in which the private sector, public sector and communities can achieve shared value from sustainable forests and sustainable land use.
Market Accelerator for Green Construction	68	90.67	Committed	ODA	Grant	Mitigation	Urban development and management	Supports build demonstration portfolios of green construction at scale, reducing emissions, mobilising new finance and inspiring markets to shift towards the new energy efficient buildings of the future.
Sustainable Infrastructure Programme – Latin America	50	66.67	Committed	ODA	Grant	Mitigation	Multisector Aid	UK-branded private finance flagship programme provides concessional financing and technical assistance for sustainable infrastructure in Latin America.
Nationally Appropriate Mitigation Actions (NAMA) Facility	45	60.00	Committed	ODA	Grant	Mitigation	General Environment Protection	The Facility supports developing countries that show strong leadership on tackling climate change and who want to implement transformational Nationally Appropriate Mitigating Actions.
Energy Sector Management Assistance Programme	19.15	25.53	Committed	ODA	Grant	Mitigation	Energy policy and administrative management	Support phase-out of coal globally and ensure technical support is available and accessible to countries wanting to consider or increase the pace of coal phase out in the short term.
Global Climate Partnership Fund	18.5	24.67	Committed	ODA	Equity	Mitigation	Energy conservation and demand-side efficiency	An investment vehicle that invests through local banks in developing countries to make finance available to small and medium enterprises (SMEs) and households in developing countries for energy efficiency improvements and renewable energy projects.
Forest Carbon Partnership Facility – Carbon Fund	15	20.00	Committed	ODA	Grant	Mitigation	Forestry policy and administrative management	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.
Climate Leadership in Cities	8.03	10.71	Committed	ODA	Grant	Mitigation	Urban development and management	The project aims to support cities in developing countries to plan for, and implement, ambitious climate actions.
International Carbon Capture, Usage and Storage	5	6.67	Committed	ODA	Grant	Mitigation	Energy generation, non-renewable sources	Supports developing and emerging economies to develop both the technical and institutional knowledge necessary to enable CCUS technology deployment.
NDC Partnership	1	1.33	Committed	ODA	Grant	Mitigation	General Environment Protection	The NDC Partnership is an new international partnership aiming to help turn countries' climate targets under the Paris Agreement, known as Nationally Determined Contributions (NDCs), into specific strategies and measures.
Support for international negotiations for the Paris Agreement	0.83	1.11	Committed	ODA	Grant	Crosscutting	Environmental policy and administrative management	To develop capacity of developing country negotiators to engage in international climate negotiations.
Climate Public Private Partnership – Asia Climate Partners	0.54	0.72	Committed	ODA	Equity	Mitigation	Energy generation, renewable sources	An equity investment in a fund that seeks to demonstrate to private sector investors that climate friendly investments in developing countries are financially viable.
Silvopastoral Systems	0.26	0.35	Committed	ODA	Grant	Mitigation	Agricultural policy and administrative management	Promotes Silvopastoral Systems (SPS) in Colombia – these are agricultural techniques which improve and convert cattle grazing land into a richer environment by planting trees, shrubs, fodder crops and living fences and conserving existing forest.
International 2050 Pathways partnerships	0.22	0.29	Committed	ODA	Grant	Mitigation	Energy research	Working directly with 10 developing country governments to help them build their own version of the UK's 2050 calculator. The calculator will explore global scenarios, illustrating the impacts of these scenarios on climate change.
Global Innovation Lab for Climate Finance	0.13	0.17	Committed	ODA	Grant	Mitigation	Business support services and institutions	Programme identifies, designs, and supports 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.
Carbon Initiative for Development	0.11	0.15	Committed	ODA	Grant	Mitigation	Energy policy and administrative management	Ci-Dev will invest in low carbon technologies that deliver community and household level benefits, particularly focused on improving poor peoples' access to clean energy. By successfully demonstrating the ability of carbon finance to deliver low carbon development in least developed countries Ci-Dev hopes to increase future carbon finance flows to these countries.
UK-Nigeria Climate Finance Accelerator	0.075	0.10	Committed	ODA	Grant	Mitigation	Energy policy and administrative management	The Climate Finance Accelerator (CFA) is an innovative international initiative aimed to accelerate the transformation of NDCs into Climate Investment Plans supported by pipelines of bankable projects needed to attract investment at scale from the private sector.
Intergovernmental Panel on Climate Change	0.31	0.41	Committed	ODA	Grant	Crosscutting	Environmental research	Supporting attendance by developing countries at IPCC Plenary meetings, scoping meetings and author meetings. Also supports developing country participation in working group III that asssess options for mitigating climate change.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Ecometrica Forests 2020	4.02	5.36	Committed	ODA	Grant	Mitigation	Research/scientific institutions	This project addresses critical gaps in current forest monitoring systems by providing a sustained and effective forest monitoring system capable of measuring forest change and providing information on the risks and drivers of forest loss.
Drought and Flood Mitigation Service	2.08	2.77	Committed	ODA	Grant	Adaptation	Research/scientific institutions	This project aims to provide accurate flood and drought predictions to farmers in Uganda and Kenya so that they are able to use that information to adjust their farming and livestock activities, with the ultimate impact of reducing the losses they would otherwise suffer from flood and drought impacts. The system is enabled through use of data with improved quality, detail and frequency from the Sentinel 1, 2 and 3 satellites (to ensure low cost) combined with SMOS/SMAP and climate modelling/ meteorological data.
Astrostat Forest Management and Protection (FMAP) System	1.98	2.64	Committed	ODA	Grant	Mitigation	Research/scientific institutions	The key aims of this project are to provide Guatemala with a centralised Forestry Management support tool that allows them to; monitor changes in the forestry canopy to look for deforestation or logging activities, identify illegal logging sites to facilitate intervention and prosecution provide information for evidence in legal proceedings. This will support Guatemala in their abilities to manage forests through knowledge exchange, capacity building and training. It will also establish a certified product for sustainable forestry management in the Central American region enabling wider roll out of the system to neighbouring countries.
Growing research capability to meet the challenges faced by developing countries – The ACACIA research partnership (UNEP- WCMC)	1.92	2.56	Committed	ODA	Grant	Adaptation	Education policy and administrative management	Our aim is of a world in which all DAC list countries make rapid progress to the achievement of the SDGs and the delivery of emissions reductions necessary for the Paris Climate Change Agreement by selecting, designing, financing, and managing dams to meet local, national and regional development needs and preferences.
Growing research capability to meet the challenges faced by developing countries – SUNRISE network	1.44	1.92	Committed	ODA	Grant	Mitigation	Education policy and administrative management	The SUNRISE network unites several leading universities and industrial collaborators from the UK and India in a transdisciplinary research collaboration. This international network will develop and implement the technology necessary to build a minimum of five solar-powered building demonstrators in rural India.
EcoProMISE	1.34	1.79	Committed	ODA	Grant	Crosscutting	Research/scientific institutions	The EcoProMIS project aims to help Colombian rice and oil palm farmers to improve productivity and stabilise incomes, allowing them to compete globally whilst responding to climate change and producing responsibly. The project uses satellite Earth Observation alongside environmental and crop data to research the impact of crop and ecosystem management on biodiversity, greenhouse gas emissions and productivity.
Addressing Challenges of Coastal Communities through Ocean Research for Developing Economies (ACCORD)	1.25	1.67	Committed	ODA	Grant	Adaptation	Environmental research	Our aim is to deliver high quality science outcomes required to improve the environmental information available to support two development challenges in coastal states on the DAC list of Official Development Aid recipients: a) Sustainable growth of, and resilience to change for, the blue economies of partner countries and b) Resilience to natural hazards including impact-based, climate-proof coastal flood warning systems.
Growing research capability to meet the challenges faced by developing countries – DAMS 2.0 project	1.2	1.60	Committed	ODA	Grant	Adaptation	Education policy and administrative management	The DAMS 2.0 project is building links between UK research bodies and institutes in Ethiopia, Ghana, India, Jordan and Myanmar, as well as influential international environmental organisations and is working to provide transformative research and knowledge on how to design and plan the complex water-energy systems that minimises impact on poor people, avoids environmental degradation and provides water and energy security for all.
Malaysia/UK research collaboration	1.17	1.56	Committed	ODA	Grant	Adaptation	Small and medium-sized enterprises (SME) development	Supporting R&D projects involving Malaysian and UK business and research collaborations, that propose innovative commercial solutions to key challenges related to climate change and its impact on urbanisation.
UNITAR: Common Sensing	0.75	1.00	Committed	ODA	Grant	Adaptation	Research/scientific institutions	The overall aim of CommonSensing is to improve resilience towards climate change, including disaster risk reduction, and contribute to sustainable development in three selected Commonwealth Small Island Developing States (SIDS): Fiji, the Solomon Islands and Vanuatu. The project will combine earth observation data to provide stakeholders with access to important information regarding disaster risks (including disaster risk planning, food security, climate risk and other environmental concerns). This information will be accessible to beneficiaries through a web portal and mobile applications.
RE-SAT – Phase 2 Call 1	0.47	0.63	Committed	ODA	Grant	Mitigation	Research/scientific institutions	The project aims to assess the feasibility (using EO data) of small island developing states to move away from fossil fuel and onto renewable energy as their primary power source. The project will use historic Earth Observation data combined with ground observations and weather models to develop a proof-of-concept energy planning tool – RE-SAT.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
Cascade processes for integrated bio-refining of agricultural waste in India and Vietnam	0.31	0.41	Committed	ODA	Grant	Crosscutting	Agricultural research	Collaborative research grant with Vietnamese partners exploring the impact of environmental change on the sustainability of rice cultivation and the socio-economic development of highly vulnerable Asia's river mega deltas. Aims to drive farm adaptation strategies (i.e. flood management), livelihood change, and define agricultural policy.
CGI: PASSES – Call 2	0.07	0.09	Committed	ODA	Grant	Crosscutting	Research/scientific institutions	This project will use satellite observations and measurements to map peat condition, even when under a forest canopy. By monitoring water levels and improving hydrology in the peatland areas, the risk of fire can be dramatically reduced. By using freely available observations from satellites through the EU Copernicus programme and use of emerging industrial hosted processing capabilities, PASSES will prove that peatland monitoring is a cost effective way to reduce forest fires.
Joint Academies Resilient Futures programme	0.02	0.03	Committed	ODA	Grant	Adaptation	Research/scientific institutions	The proposed network aims to develop a new partnership to build capacity within developing countries to support the implementation and revision of NDCs within national pro-poor climate, energy and development planning. The network will expand an existing knowledge network of researcher and practitioners largely from developing countries from the Global South to include researchers, decision-makers and stakeholders in African countries and researchers from the UK.
Climate Science for Service Partnership (CSSP – Brazil)	0.96	1.28	Committed	ODA	Grant	Mitigation	Environmental research	To strengthen the climate science and research relationship between Brazil and the UK. To work in partnership with Brazilian research institutes with the aim of improving climate and carbon cycle modelling to help inform future policy and climate service.
Climate Science for Service Partnership (CSSP – Brazil)	0.94	1.25	Committed	ODA	Grant	Crosscutting	Environmental research	Collaborative climate science research programme between Brazilian and UK to improve understanding of recent climate changes and Brazil's role in mitigation activities to inform international negotiations; to enhance projections of future weather and climate extremes and impacts to inform decision making and contribute to disaster risk reduction in Brazil.
Increase the understanding of East Asian climate variability and assessment of its predictability for improving climate prediction skills over East Asia on seasonal to decadal timescales.	1.44	1.92	Committed	ODA	Grant	Adaptation	Environmental research	Climate change research focused on impacts on regional water cycle and climate extremes within East Asia. Collaboration between scientists in UK and China to strengthen research capacity and increase understanding of drivers of regional drought and flooding, thus contributing to developing the capability of early warning methodology.
Integration of all activities across Climate Science for Service Partnership-China	1.68	2.24	Committed	ODA	Grant	Adaptation	Environmental research	China and UK collaborative development of translational science – a multi-disciplinary approach to bridge the gap between climate science and society to produce useable knowledge and applications. Development of case studies to demonstrate the value of climate science for services by translating climate information into beneficial decisions.
Improve the observational basis for understanding East Asian climate variability and change	0.73	0.97	Committed	ODA	Grant	Adaptation	Environmental research	Collaborative climate science research between Chinese and UK researchers to help better understand the likely causes of climate-related extreme events and long-term climate trends in China and East Asia region. Increased scientific understanding will help to better mitigate the risks arising from climate variability and change.
Assess model simulations of European and Chinese regional climate	1.21	1.61	Committed	ODA	Grant	Adaptation	Environmental research	Collaborative climate science research programme between Chinese and UK to develop an enhanced understanding of underpinning climate dynamics and use of this to critically examine the performance of China and UK climate models and predictions. These models underpin climate services needed to support economic development and welfare.
Accelerated improvements to climate models through collaborative climate science research between China and UK researchers.	0.42	0.56	Committed	ODA	Grant	Adaptation	Environmental research	Grants to develop methods to derive robust information on uncertainties in future climate variability and change in East Asia during the 21st century to help inform decision making and impacts analysis.
Improve the observational basis for understanding East Asian climate variability and change	0.33	0.44	Committed	ODA	Grant	Adaptation	Environmental research	Improve the observational basis for understanding East Asian climate variability and change by including early years' data through digitisation, and by developing techniques, software and tools to improve gridded datasets, including at higher temporal and spatial resolution and to assess their uncertainties. One focus could be on precipitation, to better enable the understanding of the East Asian Summer Monsoon and the wider hydrological cycle
Collaborative climate science research programme between China and UK focused on climate model development and climate prediction systems	0.25	0.33	Committed	ODA	Grant	Adaptation	Environmental research	Research into near term climate projections in China and projections of 21st century hydrological change in China aims to enable better business planning and help inform climate adaptation choices.

Recipient country/region/project/ programme	*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*	
	Domestic currency (£m)	*USD ($m)*						
UK Blue Carbon Fund, Latin America and the Caribbean	3.89	5.19	Committed	ODA	Grant	Adaptation	Forests	The objective of the Fund is to promote the sustainable management, conservation and restoration of mangrove habitats. It aims to: • Sequester or avoid 2,912,000 tonnes of GHG emissions • Restore or protect 5570ha of mangroves • Restore or protect £48m of ecosystem services • Deliver significant livelihood benefits
UK Blue Carbon Fund, Latin America and the Caribbean	3.89	5.19	Committed	ODA	Grant	Mitigation		
Blue Forests, Madagascar and Indonesia	0.74	0.99	Committed	ODA	Grant	Adaptation	Forests	Working to reduce deforestation of mangrove habitat, create new sustainable livelihoods, support community health and women's empowerment and increase climate resilience in coastal communities. This project will initially be executed in Madagascar, expanding to Indonesia and an additional country in south-east Asia. Programme is projected to protect 20,000 hectares of mangrove forests; deliver 13.9 million tonnes of carbon dioxide savings and benefit over 100,000 people.
Blue Forests, Madagascar and Indonesia	0.74	0.99	Committed	ODA	Grant	Mitigation		

Table 8
Examples of support for technology transfer

Many programmes funded by the UK actively support some form of technology development or transfer in developing countries. The list below provides some key examples:

Recipient country and/or region	*Targeted area*	*Measures and activities related to technology transfer*	*Sector*	*Source of the funding for technology transfer*	*Activities undertaken by*	*Status*	*Additional information*
Global	Mitigation	The project aims to raise the level of technical understanding of Carbon Capture, Usage and Storage (CCUS) within key developing countries and emerging economies with high emissions (such as South Africa, Mexico, Indonesia and China), leading to the establishment of the necessary policy frameworks and incentive structures to support commercial, large-scale CCUS demonstration and ultimately accelerate the deployment of CCUS.	Energy	Private and public	Private and public	Implemented	
Colombia	Mitigation	The EcoProMIS project aims to help Colombian rice and oil palm farmers to improve productivity and stabilise incomes, allowing them to compete globally whilst responding to climate change and producing responsibly. The project uses satellite Earth Observation alongside environmental and crop data to research the impact of crop and ecosystem management on biodiversity, greenhouse gas emissions and productivity.	Energy	Private and public	Private and public	Implemented	
Global	Mitigation	Global Network of Climate Technology Innovation Centres: The purpose is to build a global community of practice of entrepreneurs and innovators dedicated to develop and deploy climate smart technologies providing clean, safe, reliable and sustainable access to energy, water and other natural resources to poor communities in developing countries	Research/scientific institutions	Private and public	Private and public	Implemented	
Africa	Mitigation	Transforming Energy Access: The project is up to £65 million over five years, to support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy services for poor households and enterprises, especially in Africa. The programme will include: i) partnership with Shell Foundation, enabling support to another 30+ early stage private sector innovations. ii) Innovate UK's Energy Catalyst to stimulate technology innovation by UK enterprises; iii) build other strategic clean energy innovation partnerships (e.g. testing a new 'P2P Solar' crowdfunding platform; and scoping a potential new partnership with Gates Foundation on Mission Innovation); iv) skills and expertise development. To support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy services for poor households and enterprises, especially in Africa	Energy	Private and public	Private and public	Implemented	
Africa	Mitigation	Renewable Energy and Adaptation Climate Technologies (Africa Enterprise Challenge Fund): 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. Every business supported by REACT must demonstrate a positive impact on the rural poor through increased incomes, employment and productivity or by reducing costs.	Energy	Private and public	Private and public	Implemented	
Uganda and Kenya	Mitigation	Drought and Flood Mitigation Service: This project aims to provide accurate flood and drought predictions to farmers in Uganda and Kenya so that they are able to use that information to adjust their farming and livestock activities, with the ultimate impact of reducing the losses they would otherwise suffer from flood and drought impacts. The system is enabled through use of data with improved quality, detail and frequency from the Sentinel 1, 2 and 3 satellites (to ensure low cost) combined with SMOS/SMAP and climate modelling/meteorological data.	Research/scientific institutions	Private and public	Private and public	Implemented	
Global	Mitigation	RE-SAT - Phase 2 Call 1: This project will use satellite observations and measurements to map peat condition, even when under a forest canopy. By monitoring water levels and improving hydrology in the peatland areas, the risk of fire can be dramatically reduced. By using freely available observations from satellites through the EU Copernicus programme and use of emerging industrial hosted processing capabilities, PASSES will prove that peatland monitoring is a cost effective way to reduce forest fires.	Research/scientific institutions	Private and public	Private and public	Implemented	
Oceania	Adaptation	UNITAR: Common Sensing: The overall aim of CommonSensing is to improve resilience towards climate change, including disaster risk reduction, and contribute to sustainable development in three selected Commonwealth Small Island Developing States (SIDS): Fiji, the Solomon Islands and Vanuatu. The project will combine earth observation data to provide stakeholders with access to important information regarding disaster risks (including disaster risk planning, food security, climate risk and other environmental concerns). This information will be accessible to beneficiaries through a web portal and mobile applications.	Research/scientific institutions	Private and public	Private and public	Implemented	
Global	Mitigation	This project addresses critical gaps in current forest monitoring systems by providing a sustained and effective forest monitoring system capable of measuring forest change and providing information on the risks and drivers of forest loss.	Research/scientific institutions	Private and public	Private and public	Implemented	
East Asia	Adaptation	Improve the observational basis for understanding East Asian climate variability and change: Improve the observational basis for understanding East Asian climate variability and change by including early years' data through digitisation, and by developing techniques, software and tools to improve gridded datasets, including at higher temporal and spatial resolution and to assess their uncertainties. One focus could be on precipitation, to better enable the understanding of the East Asian Summer Monsoon and the wider hydrological cycle	Environmental research	Private and public	Private and public	Implemented	

Table 9

Examples of support for capacity building

Many programmes funded by the UK actively support some form of support for capacity building in developing countries. The list below provides some key examples:

Recipient country/ region	*Targeted area*	*Programme or project title*	*Description of programme or project*
Ethiopia	Adaptation	Building Resilience in Ethiopia (BRE)	To build Ethiopia's resilience to climate and humanitarian shocks by seeking to support the Government of Ethiopia to lead an effective and accountable humanitarian response system. It will have four key strands: Providing technical assistance to the Government of Ethiopia to lead and deliver an effective and accountable humanitarian response , delivering food and cash to people in humanitarian need in the most effective way, respond to emergency humanitarian needs in the most effective way and monitoring, evaluation and learning to strengthen humanitarian delivery in Ethiopia.
Global	Adaptation	Building Resilience and Adaptation to Climate Extremes and 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). 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. These will all contribute to the Millennium Development Goals on the eradication poverty and hunger, and environmental sustainability, and also respond to the Humanitarian and Emergency Response Review recommendation that DFID should integrate the threat from climate change into a Disaster Risk Reduction.
Africa	Mitigation	Africa Clean Energy Programme (ACE)	The programme will catalyse a market based approach for private sector delivery of solar home system (SHS) products and services. This will lead to improved energy access for people in sub-Saharan Africa currently who are currently without modern energy. The programme will work in 14 priority countries: Mozambique, Malawi, Zambia, Zimbabwe, Tanzania, Rwanda, Uganda, Kenya, Ethiopia, Somalia, Nigeria, Ghana, Sierra Leonne and Senegal. The programme will support: 1) Technical assistance to improve the enabling environment for a market based approach for private sector delivery of solar home system (SHS) products and services (Policy and Regulatory Reform, investment readiness, learning and Coordination) 2) Finance for businesses wanting to enter new and emerging SHS markets in sub-Saharan Africa for their start up and early commercialisation of ideas 3) Test innovative approaches to stimulating private sector investment and a market development."
Africa and Asia	Adaptation	CARIAA - Collaborative Adaptation Research Initiative in Africa and Asia	Research to identify what works and what doesn't in terms of cost-effective and sustainable ways to improve the resilience and capacity to adapt to climate change of the poorest and most vulnerable people and communities in three climate change 'hot spots' – semi-arid regions of Africa and Central and South Asia; low-lying heavily populated deltas of Africa and South Asia and; densely populated river basins dependent on snow-pack or glaciers.
India	Multiple Areas	Technical Assistance for Smart Cities (TASC)	To enhance the potential of Indian cities in poorer and developing states such as Madhya Pradesh, Bihar, Andhra Pradesh, Odisha, Maharashtra to promote growth and jobs creation. UK support will achieve this by developing partnerships with UK urban planning, research and business organisations to help India cities develop investment plans, attract finance and deliver smart urban solutions that create jobs for the urban poor. Activities including climate resilient infrastructure, climate and disaster risk insurance, renewable energy and water management.
Global	Mitigation	Energy Sector Management Assistance Programme	Support phase-out of coal globally and ensure technical support is available and accessible to countries wanting to consider or increase the pace of coal phase out in the short term.
Global	Mitigation	International 2050 Calculator	Working directly with 10 developing country governments to help them build their own version of the UK's 2050 calculator. The calculator will explore global scenarios, illustrating the impacts of these scenarios on climate change.
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.
Tanzania	Adaptation	Building Urban Resilience to Climate Change in Tanzania	To build urban resilience to current climate variability and future climate change in Tanzania's cities and towns through improved data and evidence, urban planning, and infrastructure provision for sustainable economic growth and development.
South Asia	Adaptation	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, India, Nepal and Pakistan. This will done by strengthening planning, budgeting, delivery mechanisms, building awareness and capacity of stakeholders through technical and some implementation support. It will help to mobilise domestic and International finance. Sharing lessons and knowledge in South Asia is a key element of the project.

Annex 2 Sectoral definitions and inclusion

Sector	Category name	IPCC category	Source name
Energy Supply	Coal mining and handling	1B1a1i	Deep-mined coal
		1B1a1ii	Coal storage and transport
		1B1a1iii	Closed Coal Mines
		1B1a2i	Open-cast coal
	Exploration, production and transport of gas	1B2b1	Upstream Gas Production – Offshore Well Testing
		1B2b3	Upstream Gas Production – process emissions
		1B2b4	Gas leakage
			Upstream Gas Production – Gas terminal storage
		1B2b5	Gas leakage
	Exploration, production and transport of oils	1B2a1	Upstream Oil Production – Offshore Well Testing
		1B2a2	Petroleum processes
			Upstream Oil Production – process emissions
		1B2a3	Upstream Oil Production – Offshore Oil Loading
			Upstream Oil Production – Onshore Oil Loading
		1B2a4	Upstream Oil Production – Oil terminal storage
	Manufacture of solid fuels and other energy industries	1A1ci	Coke production
			Solid smokeless fuel production
		1A1cii	Upstream Gas Production – fuel combustion
			Upstream oil and gas production – combustion at gas separation plant
			Upstream Oil Production – fuel combustion
		1A1ciii	Collieries – combustion
			Gas production
			Nuclear fuel production
			Town gas manufacture

Sector	Category name	IPCC category	Source name
	Offshore oil and gas – flaring	1B2c2i	Upstream Oil Production – flaring
		1B2c2ii	Upstream Gas Production – flaring
	Offshore oil and gas – venting	1B2c1i	Upstream Oil Production – venting
		1B2c1ii	Upstream Gas Production – venting
	Power station flue-gas desulphurisation	2A4d	Power stations – FGD
	Power stations	1A1ai	Autogenerators
			Miscellaneous industrial/commercial combustion
			Power stations
			Public sector combustion
	Refineries	1A1b	Refineries – combustion
	Solid fuel transformation	1B1b	Charcoal production
			Coke production
			Iron and steel – flaring
			Solid smokeless fuel production
Business	Electronics, electrical insulation, scientific research, military applications and sporting goods	2E1	Electronics – HFC
			Electronics – NF_3
		2G1	Electrical insulation
		2G2a	AWACS
		2G2b	Particle accelerators
		2G2e	Electronics – PFC
			Electronics – SF_6
			SF6 used as a tracer gas
			Sporting goods
	Firefighting	2F3	Firefighting
	Foams	2F2a	Foams
			Foams HFCs for the 2006 GLs

Sector	Category name	IPCC category	Source name
	Incidental lubricant combustion in engines	2D1	Industrial engines
	Iron and steel – combustion and electricity	1A2a	Blast furnaces
			Iron and steel – combustion plant
	Miscellaneous industrial and commercial combustion and electricity	1A4ai	Miscellaneous industrial/commercial combustion
	N_2O use as an anaesthetic	2G3a	N_2O use as an anaesthetic
	Non energy use of fuels	2D3	Non Energy Use: petroleum coke
	One Component Foams	2F2b	One Component Foams
	Other industrial combustion and electricity	1A2b	Autogeneration – exported to grid
			Autogenerators
			Non-Ferrous Metal (combustion)
		1A2c	Chemicals (combustion)
		1A2d	Pulp, Paper and Print (combustion)
		1A2e	Food & drink, tobacco (combustion)
		1A2f	Cement production – combustion
			Lime production – non decarbonising
			Other industrial combustion
		1A2gvii	Industrial off-road mobile machinery
		1A2gviii	Autogeneration – exported to grid
			Autogenerators
			Other industrial combustion
		2B1	Ammonia production – combustion
		2B8a	Methanol production – combustion
		2B8g	Chemicals (combustion)

Sector	Category name	IPCC category	Source name
	Refrigeration and air conditioning	2F1a	Commercial Refrigeration
		2F1b	Domestic Refrigeration
		2F1c	Industrial Refrigeration
		2F1d	Refrigerated Transport
		2F1e	Mobile Air Conditioning
		2F1f	Stationary Air Conditioning
		2F6b	F-gas handling
			Refrigerant containers
	Solvents	2F5	Precision cleaning – HFC
	Accidental fires – business	5C2.2b	Accidental fires – other buildings
Transport	Aircraft support vehicles	1A3eii	Aircraft – support vehicles
	Buses	1A3biii	Road transport – buses and coaches – motorway driving
			Road transport – buses and coaches – rural driving
			Road transport – buses and coaches – urban driving
	Civil aviation (domestic, cruise)	1A3a	Aircraft – domestic cruise
			Aircraft between UK and Bermuda – Cruise
			Aircraft between UK and CDs – Cruise
			Aircraft between UK and Gibraltar – Cruise
			Aircraft between UK and other OTs (excl Gib. and Bermuda) – Cruise
	Civil aviation (domestic, landing and take off)	1A3a	Aircraft – domestic take off and landing
			Aircraft between UK and Bermuda – TOL
			Aircraft between UK and CDs – TOL
			Aircraft between UK and Gibraltar – TOL
			Aircraft between UK and other OTs (excl Gib. and Bermuda) – TOL
	Fishing vessels	1A4ciii	Fishing vessels

Sector	Category name	IPCC category	Source name
	HGVs	1A3biii	Road transport – HGV articulated – motorway driving
			Road transport – HGV articulated – rural driving
			Road transport – HGV articulated – urban driving
			Road transport – HGV rigid – motorway driving
			Road transport – HGV rigid – rural driving
			Road transport – HGV rigid – urban driving
	Light duty vehicles	1A3bii	Road transport – LGVs – cold start
			Road transport – LGVs – motorway driving
			Road transport – LGVs – rural driving
			Road transport – LGVs – urban driving
	Military aircraft and shipping	1A5b	Aircraft – military
			Shipping – naval
	Mopeds & motorcycles	1A3biv	Road transport – mopeds (<50cc 2st) – urban driving
			Road transport – motorcycle (>50cc 2st) – urban driving
			Road transport – motorcycle (>50cc 4st) – motorway driving
			Road transport – motorcycle (>50cc 4st) – rural driving
			Road transport – motorcycle (>50cc 4st) – urban driving
	National navigation	1A3d	Inland goods-carrying vessels
			Motorboats / workboats (e.g. canal boats, dredgers, service boats, tourist boats, river boats)
			Personal watercraft e.g. jet ski
			Sailing boats with auxiliary engines
			Shipping – coastal
			Shipping between UK and Bermuda
			Shipping between UK and CDs
			Shipping between UK and Gibraltar
			Shipping between UK and OTs (excl. Gib and Bermuda)

Sector	Category name	IPCC category	Source name
	Passenger cars	1A3bi	Road transport – cars – cold start
			Road transport – cars – motorway driving
			Road transport – cars – rural driving
			Road transport – cars – urban driving
	Railways	1A3c	Rail – coal
			Railways – freight
			Railways – intercity
			Railways – regional
	Railways – stationary combustion	1A4ai	Railways – stationary combustion
	Road vehicle LPG and biofuel use (all vehicles)	1A3bv	Road transport – all vehicles biofuels use
			Road transport – all vehicles LPG use
	Urea use in abatement technology	2D3	Road transport – urea
	Incidental lubricant combustion in marine engines	2D1	Marine engines
	Incidental lubricant combustion in road engines	2D1	Road vehicle engines
Public	Public	1A4ai	Public sector combustion
Residential	Aerosols and metered dose inhalers	2F4a	Metered dose inhalers
		2F4b	Aerosols – halocarbons
	Residential combustion	1A4bi	Domestic combustion
		1A4bii	House and garden machinery
	Use of non aerosol consumer products	2D2	Non-aerosol products – household products
	Composting – household	5B1a	Composting (at household)
	Accidental fires – residential	5C2.2b	Accidental fires – dwellings
			Accidental fires – vehicles
	Small-scale waste burning	5C2.1b	Small-scale waste burning

Sector	Category name	IPCC category	Source name
Industrial Process	Adipic acid production	2B3	Adipic acid production
	Aluminium production	2C3a	Primary aluminium production – general
		2C3b	Primary aluminium production – PFC emissions
	Ammonia production	2B1	Ammonia production – feedstock use of gas
	Bricks production	2A4a	Brick manufacture – all types
	Cement production	2A1	Cement – decarbonising
	Glass production	2A3	Glass – general
	Halocarbon production	2B9a1	Halocarbons production – by-product
		2B9b3	Halocarbons production – fugitive
	Iron and steel production	2C1a	Basic oxygen furnaces
			Electric arc furnaces
			Ladle arc furnaces
		2C1b	Iron and steel – flaring
	Lime production	2A2	Lime production – decarbonising
	Magnesium cover gas	2C4	Magnesium cover gas
	Nitric acid production	2B2	Nitric acid production
	Non ferrous metal processes	2C6	Non-ferrous metal processes
	Other – chemical industry	2B10	Chemical industry – general
		2B8a	Chemical industry – methanol
		2B8b	Chemical industry – ethylene
		2B8c	Chemical Industry – ethylene dichloride
		2B8d	Chemical industry – ethylene oxide
		2B8e	Chemical industry – acrylonitrile
		2B8f	Chemical industry – carbon black
		2G4	Chemical Industry – other process sources
	Sinter production	2C1d	Sinter production

Sector	Category name	IPCC category	Source name
	Soda ash production	2B7	Chemical industry – soda ash
	Titanium dioxide production	2B6	Chemical industry – titanium dioxide
	Use of N_2O	2G3b	Other food – cream consumption
			Recreational use of N_2O
	Fletton brick production	2A4a	Brick manufacture – Fletton
Agriculture	Cattle – enteric fermentation	3A1a	Enteric
		3A1b	Enteric
	Cattle – wastes	3B11a	Excreta
			Managed Manure
		3B11b	Excreta
			Managed Manure
		3B21a	Dairy – Dairy Cows – Direct
		3B21b	Other cattle – Beef females for slaughter – Direct
			Other cattle – Bulls for breeding – Direct
			Other cattle – Cereal fed bull – Direct
			Other cattle – Cows – Direct
			Other cattle – Dairy Calves Female – Direct
			Other cattle – Dairy In Calf Heifers – Direct
			Other cattle – Dairy Replacements Female – Direct
			Other cattle – Heifers for breeding – Direct
			Other cattle – Steers – Direct

Sector	Category name	IPCC category	Source name
		3B25	Dairy – Dairy Cows – Indirect Deposition
			Dairy – Dairy Cows – Indirect Leach
			Other cattle – Beef females for slaughter – Indirect Deposition
			Other cattle – Beef females for slaughter – Indirect Leach
			Other cattle – Bulls for breeding – Indirect Deposition
			Other cattle – Bulls for breeding – Indirect Leach
			Other cattle – Cereal fed bull – Indirect Deposition
			Other cattle – Cereal fed bull – Indirect Leach
			Other cattle – Cows – Indirect Deposition
			Other cattle – Cows – Indirect Leach
			Other cattle – Dairy Calves Female – Indirect Deposition
			Other cattle – Dairy Calves Female – Indirect Leach
			Other cattle – Dairy In Calf Heifers – Indirect Deposition
			Other cattle – Dairy In Calf Heifers – Indirect Leach
			Other cattle – Dairy Replacements Female – Indirect Deposition
			Other cattle – Dairy Replacements Female – Indirect Leach
			Other cattle – Heifers for breeding – Indirect Deposition
			Other cattle – Heifers for breeding – Indirect Leach
			Other cattle – Steers – Indirect Deposition
			Other cattle – Steers – Indirect Leach
	Deer – enteric fermentation	3A4	Enteric
	Deer – wastes	3B14	Wastes
		3B24	Deer Wastes – Direct
		3B25	Deer Wastes – Indirect Leaching
			Deer Wastes – Indirect Volatilisation

Sector	Category name	IPCC category	Source name
	Direct soil emission	3D11	Arable – Direct
			Grass – Direct
		3D12a	Dairy – Dairy Cows – Direct
			FAM – direct
			Goats FAM – Direct
			Horses FAM – direct
			Other cattle – Beef females for slaughter – Direct
			Other cattle – Bulls for breeding – Direct
			Other cattle – Cereal fed bull – Direct
			Other cattle – Cows – Direct
			Other cattle – Dairy Calves Female – Direct
			Other cattle – Dairy In Calf Heifers – Direct
			Other cattle – Dairy Replacements Female – Direct
			Other cattle – Heifers for breeding – Direct
			Other cattle – Steers – Direct
			Pig – Boar – Direct
			Pig – Fattening Pig < 20 kg – Direct
			Pig – Fattening Pig > 80 kg – Direct
			Pig – Fattening Pig 20 to 80 kg – Direct
			Pig – Gilt – Direct
			Pig – Sow – Direct
			Poultry – Breeding Flock – Direct
			Poultry – Broilers – Direct
			Poultry – Ducks – Direct
			Poultry – Geese – Direct
			Poultry – Growing Pullets – Direct
			Poultry – Laying Hens – Direct

Sector	Category name	IPCC category	Source name
			Poultry – Other – Direct
			Poultry – Turkeys – Direct
			Sheep – Ewe – Direct
			Sheep – Lamb – Direct
		3D12b	Sewage Sludge Application – Direct
		3D13	All Horses PRP – Direct
			Dairy – Dairy Cows – Direct
			Deer PRP – Direct
			Goats PRP – Direct
			Other cattle – Beef females for slaughter – Direct
			Other cattle – Bulls for breeding – Direct
			Other cattle – Cereal fed bull – Direct
			Other cattle – Cows – Direct
			Other cattle – Dairy Calves Female – Direct
			Other cattle – Dairy In Calf Heifers – Direct
			Other cattle – Dairy Replacements Female – Direct
			Other cattle – Heifers for breeding – Direct
			Other cattle – Steers – Direct
			Pig – Boar – Direct
			Pig – Fattening Pig < 20 kg – Direct
			Pig – Fattening Pig > 80 kg – Direct
			Pig – Fattening Pig 20 to 80 kg – Direct
			Pig – Gilt – Direct
			Pig – Sow – Direct
			Poultry – Breeding Flock – Direct
			Poultry – Broilers – Direct

Sector	Category name	IPCC category	Source name
			Poultry – Ducks – Direct
			Poultry – Geese – Direct
			Poultry – Growing Pullets – Direct
			Poultry – Laying Hens – Direct
			Poultry – Other – Direct
			Poultry – Turkeys – Direct
			Sheep – Ewe – Direct
			Sheep – Lamb – Direct
			Sheep – Ram – Direct
		3D14	Arable – Direct
			Grass – Direct
		3D15	Cropland management
		3D16	Managed Histosols
	Field burning of agricultural wastes	3F11	Field burning
		3F12	Field burning
		3F14	Field burning
		3F5	Field burning
		3F	Field burning
	Goats – enteric fermentation	3A4	Enteric
	Goats – wastes	3B14	Wastes
		3B24	Goats Wastes – Direct
		3B25	Goats Wastes – Indirect Leaching
			Goats Wastes – Indirect Volatilisation
	Horses – enteric fermentation	3A4	Enteric

Sector	Category name	IPCC category	Source name
	Horses – wastes	3B14	Wastes
		3B24	Horses Wastes – Direct
		3B25	Horses Wastes – Indirect Leaching
			Horses Wastes – Indirect Volatilisation
	Incidental lubricant combustion in engines	2D1	Agricultural engines
	Indirect soil emission	3D21	Arable – Indirect Deposition
			Dairy – Dairy Cows – Indirect Deposition
			Deer FAM – Indirect Volatilisation
			Deer PRP – Indirect Volatilisation
			Goats FAM – Indirect Volatilisation
			Goats PRP – Indirect Volatilisation
			Grass – Indirect Deposition
			Horses FAM – Indirect Volatilisation
			Horses PRP – Indirect Volatilisation
			Other cattle – Beef females for slaughter – Indirect Deposition
			Other cattle – Bulls for breeding – Indirect Deposition
			Other cattle – Cereal fed bull – Indirect Deposition
			Other cattle – Cows – Indirect Deposition
			Other cattle – Dairy Calves Female – Indirect Deposition
			Other cattle – Dairy In Calf Heifers – Indirect Deposition
			Other cattle – Dairy Replacements Female – Indirect Deposition
			Other cattle – Heifers for breeding – Indirect Deposition
			Other cattle – Steers – Indirect Deposition
			Pig – Boar – Indirect Deposition
			Pig – Fattening Pig < 20 kg – Indirect Deposition
			Pig – Fattening Pig > 80 kg – Indirect Deposition

Sector	Category name	IPCC category	Source name
			Pig – Fattening Pig 20 to 80 kg – Indirect Deposition
			Pig – Gilt – Indirect Deposition
			Pig – Sow – Indirect Deposition
			Poultry – Breeding Flock – Indirect Deposition
			Poultry – Broilers – Indirect Deposition
			Poultry – Ducks – Indirect Deposition
			Poultry – Geese – Indirect Deposition
			Poultry – Growing Pullets – Indirect Deposition
			Poultry – Laying Hens – Indirect Deposition
			Poultry – Other – Indirect Deposition
			Poultry – Turkeys – Indirect Deposition
			Sewage Sludge Application – Indirect Volatilisation
			Sheep – Ewe – Indirect Deposition
			Sheep – Lamb – Indirect Deposition
			Sheep – Ram – Indirect Deposition
		3D22	Arable – Indirect Leach
			Arable – Residue Indirect Leach
			Cropland management
			Dairy – Dairy Cows – Indirect Leach
			Deer FAM – Indirect Leaching
			Deer PRP – Indirect Leaching
			Goats FAM – Indirect Leaching
			Goats PRP – Indirect Leaching
			Grass – Indirect Leach
			Grass – Residue Indirect Leach
			Horses FAM – Indirect Leaching

Sector	Category name	IPCC category	Source name
			Horses PRP – Indirect Leaching
			Other cattle – Beef females for slaughter – Indirect Leach
			Other cattle – Bulls for breeding – Indirect Leach
			Other cattle – Cereal fed bull – Indirect Leach
			Other cattle – Cows – Indirect Leach
			Other cattle – Dairy Calves Female – Indirect Leach
			Other cattle – Dairy In Calf Heifers – Indirect Leach
			Other cattle – Dairy Replacements Female – Indirect Leach
			Other cattle – Heifers for breeding – Indirect Leach
			Other cattle – Steers – Indirect Leach
			Pig – Boar – Indirect Leach
			Pig – Fattening Pig < 20 kg – Indirect Leach
			Pig – Fattening Pig > 80 kg – Indirect Leach
			Pig – Fattening Pig 20 to 80 kg – Indirect Leach
			Pig – Gilt – Indirect Leach
			Pig – Sow – Indirect Leach
			Poultry – Breeding Flock – Indirect Leach
			Poultry – Broilers – Indirect Leach
			Poultry – Ducks – Indirect Leach
			Poultry – Geese – Indirect Leach
			Poultry – Growing Pullets – Indirect Leach
			Poultry – Laying Hens – Indirect Leach
			Poultry – Other – Indirect Leach
			Poultry – Turkeys – Indirect Leach
			Sewage Sludge Application – Indirect Leaching
			Sheep – Ewe – Indirect Leach
			Sheep – Lamb – Indirect Leach

Sector	Category name	IPCC category	Source name
			Sheep – Ram – Indirect Leach
	Liming	3G1	Liming
		3G2	Liming
	Pigs – enteric fermentation	3A3	Enteric
	Pigs – wastes	3B13	Excreta
			Managed Manure
		3B23	Pig – Boar – Direct
			Pig – Fattening Pig < 20 kg – Direct
			Pig – Fattening Pig > 80 kg – Direct
			Pig – Fattening Pig 20 to 80 kg – Direct
			Pig – Gilt – Direct
			Pig – Sow – Direct
		3B25	Pig – Boar – Indirect Deposition
			Pig – Boar – Indirect Leach
			Pig – Fattening Pig < 20 kg – Indirect Deposition
			Pig – Fattening Pig < 20 kg – Indirect Leach
			Pig – Fattening Pig > 80 kg – Indirect Deposition
			Pig – Fattening Pig > 80 kg – Indirect Leach
			Pig – Fattening Pig 20 to 80 kg – Indirect Deposition
			Pig – Fattening Pig 20 to 80 kg – Indirect Leach
			Pig – Gilt – Indirect Deposition
			Pig – Gilt – Indirect Leach
			Pig – Sow – Indirect Deposition
			Pig – Sow – Indirect Leach

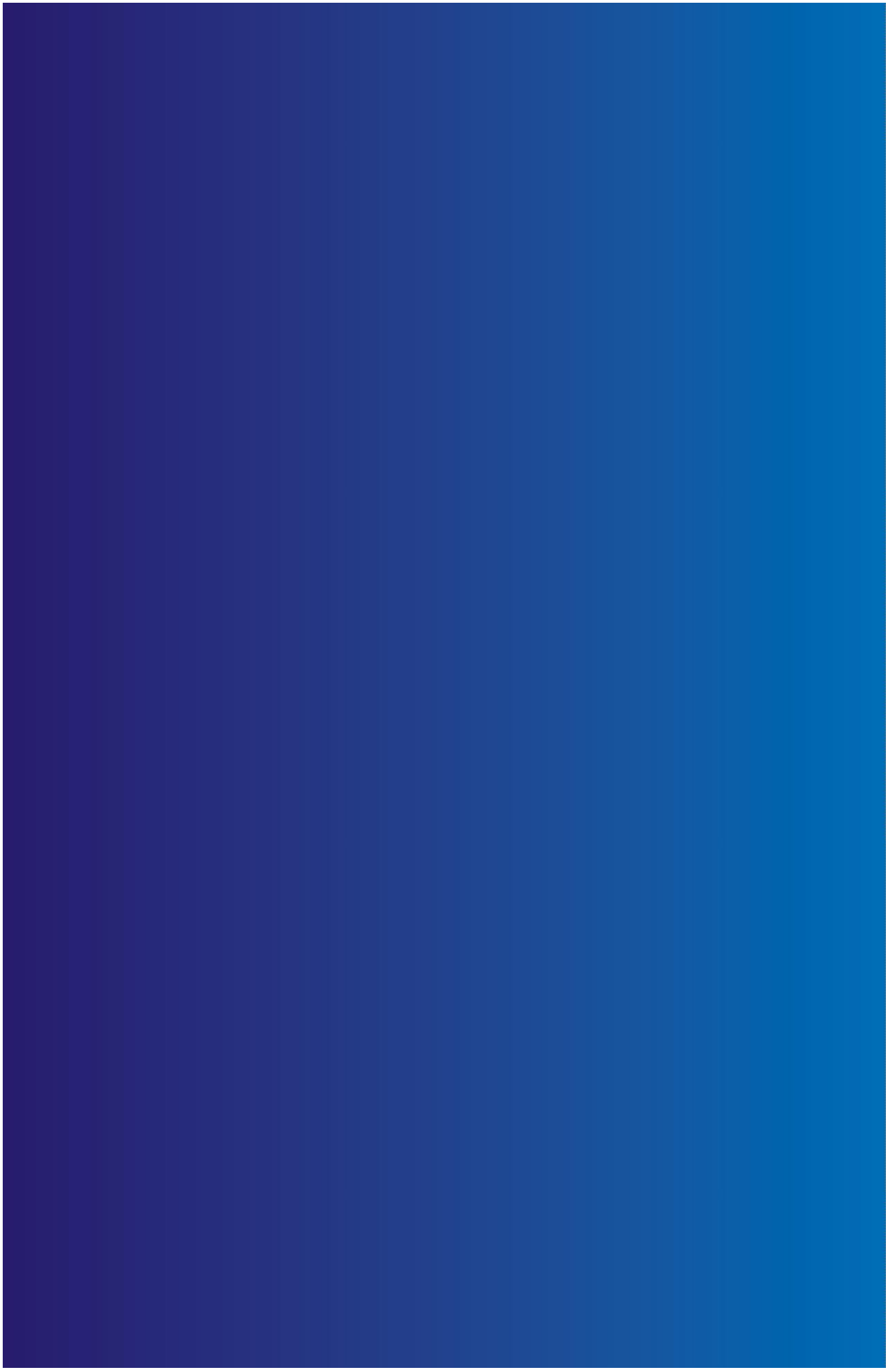
Sector	Category name	IPCC category	Source name
	Poultry	3B14	Excreta
			Managed Manure
		3B24	Poultry – Breeding Flock – Direct
			Poultry – Broilers – Direct
			Poultry – Ducks – Direct
			Poultry – Geese – Direct
			Poultry – Growing Pullets – Direct
			Poultry – Laying Hens – Direct
			Poultry – Other – Direct
			Poultry – Turkeys – Direct
		3B25	Poultry – Breeding Flock – Indirect Deposition
			Poultry – Breeding Flock – Indirect Leach
			Poultry – Broilers – Indirect Deposition
			Poultry – Broilers – Indirect Leach
			Poultry – Ducks – Indirect Deposition
			Poultry – Ducks – Indirect Leach
			Poultry – Geese – Indirect Deposition
			Poultry – Geese – Indirect Leach
			Poultry – Growing Pullets – Indirect Deposition
			Poultry – Growing Pullets – Indirect Leach
			Poultry – Laying Hens – Indirect Deposition
			Poultry – Laying Hens – Indirect Leach
			Poultry – Other – Indirect Deposition
			Poultry – Other – Indirect Leach
			Poultry – Turkeys – Indirect Deposition
			Poultry – Turkeys – Indirect Leach

Sector	Category name	IPCC category	Source name
	Sheep – enteric fermentation	3A2	Enteric
	Sheep – wastes	3B12	Excreta
			Managed Manure
		3B22	Sheep – Ewe – Direct
			Sheep – Lamb – Direct
		3B25	Sheep – Ewe – Indirect Deposition
			Sheep – Ewe – Indirect Leach
			Sheep – Lamb – Indirect Deposition
			Sheep – Lamb – Indirect Leach
	Stationary and mobile combustion	1A4ci	Agriculture – stationary combustion
		1A4cii	Agriculture – mobile machinery
	Urea application	3H	Fertiliser Application
			Agriculture – application of urea
	Overseas territory and Crown Dependency livestock emissions	3J	Agriculture livestock – all poultry wastes
			Agriculture livestock – dairy cattle enteric
			Agriculture livestock – dairy cattle wastes
			Agriculture livestock – deer enteric
			Agriculture livestock – deer wastes
			Agriculture livestock – goats enteric
			Agriculture livestock – goats wastes
			Agriculture livestock – horses enteric
			Agriculture livestock – horses wastes
			Agriculture livestock – manure leaching (indirect)
			Agriculture livestock – manure other (indirect)
			Agriculture livestock – other cattle enteric
			Agriculture livestock – other cattle wastes
			Agriculture livestock – other poultry wastes

Sector	Category name	IPCC category	Source name
			Agriculture livestock – pigs enteric
			Agriculture livestock – pigs wastes
			Agriculture livestock – sheep enteric
			Agriculture livestock – sheep wastes
	Overseas territory and Crown Dependency soil emissions	3J	OvTerr Agricultural Soils
Land Use Change	Biomass burning – cropland	4B1	Cropland remaining Cropland – Biomass Burning – Wildfires
		4B2	Forest Land converted to Cropland – Biomass Burning – Controlled Burning
	Biomass burning – Forest land	4A1	Forest Land remaining Forest Land – Biomass Burning – Wildfires
	Biomass burning – grassland	4C1	Grassland remaining Grassland – Biomass Burning – Wildfires
		4C2	Forest Land converted to Grassland – Biomass Burning – Controlled Burning
	Biomass burning – settlements	4E2	Forest Land converted to Settlements – Biomass Burning – Controlled Burning
	Cropland remaining cropland	4B1	Carbon stock change
			Cropland remaining Cropland – Carbon stock change
	Direct N_2O emissions from N mineralization/immobilisation – Cropland	4B2	Forest Land converted to Cropland – Direct N_2O emissions from N Mineralization/Immobilization
			Grassland converted to Cropland – Direct N_2O emissions from N Mineralization/Immobilization
	Direct N_2O emissions from N mineralization/immobilisation – Forest Land	4A2	Cropland converted to Forest Land – Direct N_2O emissions from N Mineralization/Immobilization
			Direct N_2O emission from N fertilisation of forest land
			Grassland converted to Forest Land – Direct N_2O emissions from N Mineralization/Immobilization
			Settlements converted to Forest Land – Direct N_2O emissions from N Mineralization/Immobilization
	Direct N_2O emissions from N mineralization/ immobilisation – Grassland	4C1	Grassland remaining Grassland – Direct N_2O emissions from N Mineralization/Immobilization
		4C2	Forest Land converted to Grassland – Direct N_2O emissions from N Mineralization/Immobilization

Sector	Category name	IPCC category	Source name
	Direct N2O emissions from N mineralization/ immobilisation – Settlements	4E1	Settlements remaining Settlements – Direct N_2O emissions from N Mineralization/Immobilization
		4E2	Cropland converted to Settlements – Direct N_2O emissions from N Mineralization/Immobilization
			Forest Land converted to Settlements – Direct N_2O emissions from N Mineralization/Immobilization
			Grassland converted to Settlements – Direct N_2O emissions from N Mineralization/Immobilization
	Forest land remaining forest land	4A1	Forest Land remaining Forest Land – Carbon stock change
	Grassland remaining grassland	4C1	Grassland remaining Grassland – Carbon stock change
	Harvested wood	4G	HWP Produced and Consumed Domestically – Carbon stock change
			HWP Produced and Exported – Carbon stock change
	Indirect N_2O emissions	4	LULUCF Indirect N_2O – Atmospheric Deposition
			LULUCF Indirect N_2O – Nitrogen Leaching and Run-off
	Land converted to cropland	4B2	Forest Land converted to Cropland – Carbon stock change
			Grassland converted to Cropland – Carbon stock change
			Settlements converted to Cropland – Carbon stock change
	Land converted to forest land	4A2	Cropland converted to Forest Land – Carbon stock change
			Grassland converted to Forest Land – Carbon stock change
			Settlements converted to Forest Land – Carbon stock change
	Land converted to grassland	4C2	Cropland converted to Grassland – Carbon stock change
			Forest Land converted to Grassland – Carbon stock change
			Settlements converted to Grassland – Carbon stock change
			Wetlands converted to Grassland – Carbon stock change
	Land converted to settlements	4E2	Cropland converted to Settlements – Carbon stock change
			Forest Land converted to Settlements – Carbon stock change
			Grassland converted to Settlements – Carbon stock change
	Settlements remaining settlements	4E1	Settlements remaining Settlements – Carbon stock change
	Wetlands remaining wetland	4D1	Peat Extraction Remaining Peat Extraction – Carbon stock change

Sector	Category name	IPCC category	Source name
	Drainage of organic soils – Forest Land	4A	Forest Land – Drainage and rewetting and other management of organic and mineral soils
	Drainage of organic soils – Grassland	4C	Grassland – Drainage and rewetting and other management of organic and mineral soils
	Drainage of organic soils – Wetland	4D	Wetlands – Drainage and rewetting and other management of organic and mineral soils
	Land converted to wetland	4D2	Grassland converted to flooded land – Carbon stock change
			Land converted for Peat Extraction – Carbon stock change
Waste Management	Anaerobic digestion	5B2a	Anaerobic Digestion (other)
	Landfill	5A1a	Landfill
	Mechanical biological treatment	5B1a	Mechanical Biological Treatment – Composting
		5B2a	Mechanical Biological Treatment – Anaerobic Digestion
	Waste Incineration	5C1.1b	Incineration – sewage sludge
		5C1.2a	Incineration
		5C1.2b	Incineration – chemical waste
			Incineration – clinical waste
	Waste-water handling	5D1	Sewage sludge decomposition
			Sewage sludge decomposition in private systems
		5D2	Industrial Waste Water Treatment
	Composting – non-household	5B1a	Total composting (non-household)
			Composting (at permit sites)



Annex 3 Global Warming Potentials

List of Global Warming Potentials of greenhouse gases used in UK emissions

Greenhouse gas	Lifetime (years)	100 years GWP
Carbon dioxide	50-200	1
Methane	12	25
Nitrous oxide	114	298
HFC-23	270	14,800
HFC-32	4.9	675
HFC-41	2.4	92
HFC-43-10mee	15.9	1,640
HFC-125	29	3,500
HFC-134	9.6	1,100
HFC-134a	14	1,430
HFC-143	3.5	353
HFC-143a	52	4,470
HFC-152	0.6	53
HFC-152a	1.4	124
HFC-161	0.3	12
HFC-227ea	34.2	3,220
HFC-236cb	13.6	1,340
HFC-236ea	10.7	1,370
HFC-236fa	240	9,810
HFC-245ca	6.2	693
HFC-245fa	7.6	1,030
HFC-365mfc	8.6	794
Perfluoromethane	50,000	7,390
Perfluoroethane	10,000	12,200
Perfluoropropane	2,600	8,830
Perfluorobutane	2,600	8,860
Perfluorocyclobutane	3,200	10,300

Greenhouse gas	Lifetime (years)	100 years GWP
Perfluouropentane	4,100	9,160
Perfluorohexane	3,200	9,300
Perfluorodecalin	>1,000	>7,500
Perfluorocyclopropane	>1,000	>17,340
Sulphur hexafluoride	3,200	22,800
Nitrogen trifluoride	740	17,200

Note: GWPs listed are from Working Group 1 of the IPCC Fourth Assessment Report: Climate Change 2007.

Annex 4 Summary reports of UK GHG inventories

Summary Table for National Greenhouse Gas Inventories – 1990

Greenhouse Gas Source and Sink Categories	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	599,468.36	5,320.26	162.35	14,391.43	1,651.53	NO,NE	0.06	0.00	3,093.39	7,370.58	2,841.36	3,781.15
1. Energy	574,309.70	1,492.98	12.19						3,007.16	6,521.36	1,795.94	3,705.10
A. Fuel combustion (Sectoral approach)	566,833.21	126.11	12.06						2,993.29	6,461.13	1,003.87	3,676.64
1. Energy industries	235,851.47	8.16	4.60						864.06	136.57	9.06	2,887.66
2. Manufacturing industries and construction	95,723.43	4.67	1.08						414.36	396.85	31.14	406.08
3. Transport	119,742.52	50.38	4.87						1,423.79	4,839.93	871.50	156.33
4. Other sectors	110,222.36	62.76	1.32						252.12	1,076.15	90.06	215.49
5. Other	5,293.44	0.14	0.19						38.96	11.63	2.11	11.09
B. Fugitive emissions from fuels	7,476.49	1,366.88	0.14						13.87	60.22	792.07	28.46
1. Solid fuels	1,698.56	873.07	0.00						0.53	38.73	223.63	20.68
2. Oil and natural gas and other emissions from energy production	5,777.92	493.80	0.14						13.34	21.49	568.44	7.78
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	24,527.37	10.92	81.91	14391.43	1651.53	NO,NE	0.06	0.00	37.83	611.93	926.47	68.80
A. Mineral industry	9,803.78								NO	5.30	4.74	4.27
B. Chemical industry	6,770.09	8.20	79.86	14386.73	17.55	NO	NO	NO	18.39	93.11	172.14	39.53
C. Metal industry	7,400.69	1.48	0.06	NO	1553.11		0.02		19.29	508.85	2.38	23.13
D. Non-energy products from fuels and solvent use	552.81	NO,IE	NO,NE,IE						NO,IE	NO,IE	660.45	1.87
E. Electronic industry				4.34	NO,NE,IE	NO,NE	NO,NE,IE	0.00				

Greenhouse Gas Source and Sink Categories	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
F. Product uses as substitutes for ODS				0.36	NO							
G. Other product manufacture and use	NO	NO	1.99		80.87		0.04		0.15	4.68	0.41	NO
H. Other	IE,NE,NO	1.24	NO						NO	IE,NO	86.36	IE,NO
3. Agriculture	1,342.78	1,223.53	57.86						41.17	190.77	102.34	NO
A. Enteric fermentation		1,015.70										
B. Manure management		189.30	11.55								90.21	
C. Rice cultivation		NO									NO	
D. Agricultural soils		NE	45.67						32.68	NE	8.50	
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		7.46	0.19						6.44	190.77	3.63	
G. Liming	1,012.43											
H. Urea application	327.60											
I. Other carbon-containing fertilizers	NO											
J. Other	2.75	11.07	0.44						2.05	0.00	0.00	NO
4. Land use, land-use change and forestry	-2,012.20	0.64	7.56						0.77	16.45	NO	NO
A. Forest land	-15,026.26	0.12	0.78						0.07	2.63	NO	
B. Cropland	14,265.93	0.00	3.42						0.00	0.10	NO	
C. Grassland	-7,111.03	0.40	0.03						0.62	10.98	NO	
D. Wetlands	486.95	NO,NE,NA	0.01						NO	NO	NO	
E. Settlements	7,011.30	0.12	1.96						0.08	2.73	NO	
F. Other land	NO	NO	NO						NO	NO	NO	
G. Harvested wood products	-1,639.08											
H. Other	NO	NO	NO						NO	NO	NO	NO

Greenhouse Gas Source and Sink Categories	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
5. Waste	1,300.71	2,592.19	2.83						6.46	30.06	16.61	7.25
A. Solid waste disposal	NO,NE	2,417.32							NO,NE	NO,NE	9.17	
B. Biological treatment of solid waste		0.73	0.04						NE	NE	NE	
C. Incineration and open burning of waste	1,300.71	5.39	0.16						6.46	30.06	7.18	7.25
D. Wastewater treatment and discharge		168.76	2.63						NO,NE	NO,NE	0.27	
E. Other	NO	NO	NO						NO	NO	NO	NO
International bunkers	24,587.98	0.42	0.92						295.84	29.80	11.86	148.65
Aviation	15,433.52	0.28	0.49						70.13	20.75	4.93	2.95
Navigation	9,154.47	0.14	0.43						225.70	9.05	6.93	145.70

Summary Table for National Greenhouse Gas Inventories – 2017

Greenhouse Gas Source and Sink Categories	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
Total national emissions and removals	37,6771.27	2,076.50	69.39	14,192.82	371.47	NO	0.02	0.00	888.72	1,559.15	808.95	177.18
1. Energy	372,285.99	280.14	8.43						846.92	1,301.56	256.71	158.88
A. Fuel combustion (Sectoral approach)	367,695.81	63.22	8.30						844.76	1,283.43	118.93	148.03
1. Energy industries	102,629.11	15.24	2.52						189.28	73.86	3.57	62.48
2. Manufacturing industries and construction	51,175.55	4.96	0.84						134.88	358.20	21.37	31.32
3. Transport	123,345.32	4.17	4.06						407.97	315.79	42.33	13.84
4. Other sectors	88,987.64	38.81	0.82						100.13	532.20	51.05	38.90
5. Other	1,558.20	0.04	0.06						12.50	3.37	0.62	1.49
B. Fugitive emissions from fuels	4,590.18	216.92	0.13						2.17	18.14	137.77	10.85
1. Solid fuels	359.54	19.51	0.00						0.09	7.66	1.14	10.48
2. Oil and natural gas and other emissions from energy production	4,230.64	197.41	0.13						2.08	10.48	136.63	0.37
C. CO_2 Transport and storage	NO											
2. Industrial processes and product use	14,273.11	3.12	2.98	14,192.82	371.47	NO	0.02	0.00	12.15	210.51	442.94	17.62
A. Mineral industry	6,249.48								NO	1.87	2.31	6.65
B. Chemical industry	4,931.56	2.46	0.13	2.55	172.90	NO	NO	NO	4.87	22.50	13.97	1.19
C. Metal industry	2,572.86	0.43	0.02	2.29	15.07		0.00		7.23	184.62	1.09	8.81
D. Non-energy products from fuels and solvent use	519.22	NO,IE	NO,NE,IE						NO,IE	NO,IE	321.06	0.96
E. Electronic industry				21.18	NO,IE	NO	NO,IE	0.00				
F. Product uses as substitutes for ODS				14,166.81	NO							
G. Other product manufacture and use	NO	NO	2.83		183.51		0.02		0.05	1.52	0.13	NO
H. Other	NO,NE,IE	0.24	NO						NO	NO,IE	104.38	NO,IE

Greenhouse Gas Source and Sink Categories	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
3. Agriculture	1,283.09	1,035.66	48.24						27.24	NO,NE,NA	102.45	NO
A. Enteric fermentation		858.34										
B. Manure management		169.07	9.45								94.28	
C. Rice cultivation		NO									NO	
D. Agricultural soils		NE	38.48						25.56	NE	8.17	
E. Prescribed burning of savannas		NO	NO						NO	NO	NO	
F. Field burning of agricultural residues		NO	NO						NO	NO	NO	
G. Liming	936.67											
H. Urea application	343.95											
I. Other carbon-containing fertilizers	NO											
J. Other	2.46	8.25	0.31						1.68	NO,NE,NA	NO,NE,NA	NO
4. Land use, land-use change and forestry	-11,329.82	1.13	4.73						0.88	26.66	NO	NO
A. Forest land	-18,211.77	0.09	0.49						0.06	2.10	NO	
B. Cropland	10,971.23	0.00	1.55						0.00	0.03	NO	
C. Grassland	-8,861.80	0.71	0.11						0.61	17.01	NO	
D. Wetlands	336.78	NO,NE,NA	0.00						NO	NO	NO	
E. Settlements	6,451.34	0.33	1.76						0.21	7.51	NO	
F. Other land	NO	NO	NO						NO	NO	NO	
G. Harvested wood products	-2,015.60											
H. Other	NO	NO	NO						NO	NO	NO	NO

Greenhouse Gas Source and Sink Categories	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3	NO_x	CO	NMVOC	SO_2
	(kt)			(kt CO_2 equivalent)					(kt)			
5. Waste	258.91	756.45	5.01						1.52	20.41	6.86	0.69
A. Solid waste disposal	NO,NE	570.46							NO,NE	NO,NE	2.34	
B. Biological treatment of solid waste		47.74	2.44						NE	NE	NE	
C. Incineration and open burning of waste	258.91	0.42	0.13						1.52	20.41	4.25	0.69
D. Wastewater treatment and discharge		137.83	2.44						NO,NE	NO,NE	0.27	
E. Other	NO	NO	NO						NO	NO	NO	NO
International bunkers												
Aviation												
Navigation												

Summary Report for CO_2 equivalent – 1990

Greenhouse Gas Source and Sink Categories	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
					CO_2 equivalent (kt)				
Total (net emissions)	599,468.36	133,006.57	48,379.73	14,391.43	1,651.53	1,305.31	NO,NE	0.42	798,203.35
1. Energy	574,309.70	37,324.55	3,633.48						615,267.74
A. Fuel combustion (sectoral approach)	566,833.21	3,152.63	3,592.64						573,578.48
1. Energy industries	235,851.47	204.00	1,370.01						237,425.48
2. Manufacturing industries and construction	95,723.43	116.67	321.80						96,161.90
3. Transport	119,742.52	1,259.48	1,451.62						122,453.62
4. Other sectors	110,222.36	1,568.92	393.08						112,184.36
5. Other	5,293.44	3.56	56.12						5,353.12
B. Fugitive emissions from fuels	7,476.49	34,171.92	40.85						41,689.26
1. Solid fuels	1,698.56	21,826.86	0.09						23,525.51
2. Oil and natural gas	5,777.92	12,345.07	40.75						18,163.75
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	24,527.37	272.89	24,408.58	14,391.43	1,651.53	1,305.31	NO,NE	0.42	66,557.52
A. Mineral industry	9,803.78								9,803.78
B. Chemical industry	6,770.09	204.89	23,797.27	14,386.73	17.55	NO	NO	NO	45,176.53
C. Metal industry	7,400.69	36.90	17.74	NO	1,553.11	387.17			9,395.61
D. Non-energy products from fuels and solvent use	552.81	NO,IE	NO,NE,IE						552.81
E. Electronic Industry				4.34	NO,NE,IE	NO,NE,IE	NO,NE	0.42	4.75
F. Product uses as ODS substitutes				0.36	NO				0.36
G. Other product manufacture and use	NO	NO	593.57		80.87	918.14			1,592.58
H. Other	IE,NE,NO	31.10	NO						31.10

Greenhouse Gas Source and Sink Categories	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
					CO_2 equivalent (kt)				
3. Agriculture	1342.78	30,588.33	17,242.74						49,173.86
A. Enteric fermentation		25,392.50							25,392.50
B. Manure management		4,732.53	3,442.70						8,175.23
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	13610.39						13,610.39
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		186.57	57.66						244.23
G. Liming	1,012.43								1,012.43
H. Urea application	327.60								327.60
I. Other carbon-containing fertilizers	NO								NO
J. Other	2.75	276.73	132.00						411.48
4. Land use, land-use change and forestry	-2,012.20	15.95	2,251.71						255.46
A. Forest land	-15026.26	2.89	231.22						-14,792.15
B. Cropland	14,265.93	0.09	1,019.85						15,285.87
C. Grassland	-7,111.03	9.97	10.33						-7,090.73
D. Wetlands	486.95	NO,NE,NA	4.13						491.09
E. Settlements	7,011.30	3.00	584.68						7,598.98
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-1,639.08								-1,639.08
H. Other	NO	NO	NO						NO

Greenhouse Gas Source and Sink Categories	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
					CO_2 equivalent (kt)				
5. Waste	1,300.71	64,804.85	843.22						66,948.77
A. Solid waste disposal	NO,NE	60,432.98							60,432.98
B. Biological treatment of solid waste		18.13	12.97						31.10
C. Incineration and open burning of waste	1,300.71	134.83	46.66						1,482.20
D. Waste water treatment and discharge		4,218.90	783.59						5,002.49
E. Other	NO	NO	NO						NO
International bunkers	24,587.98	10.55	274.55						24,873.08
Aviation	15,433.52	7.11	146.02						15,586.65
Navigation	9,154.47	3.44	128.52						9,286.43

Summary Report for CO_2 equivalent – 2017

Greenhouse Gas Source and Sink Categories	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
					CO_2 equivalent (kt)				
Total (net emissions)	376,771.27	51,912.53	20,679.40	14,192.82	371.47	525.41	NO	0.53	464,453.44
1. Energy	372,285.99	7,003.54	2,513.30						381,802.83
A. Fuel combustion (sectoral approach)	367,695.81	1,580.53	2,473.92						371,750.25
1. Energy industries	102,629.11	381.11	751.36						103,761.58
2. Manufacturing industries and construction	51,175.55	124.01	249.64						51,549.20
3. Transport	123,345.32	104.21	1,211.08						124,660.60
4. Other sectors	88,987.64	970.17	245.36						90,203.17
5. Other	1,558.20	1.03	16.48						1,575.70
B. Fugitive emissions from fuels	4,590.18	5,423.01	39.38						10,052.57
1. Solid fuels	359.54	487.76	0.02						847.32
2. Oil and natural gas	4,230.64	4,935.25	39.36						9,205.25
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	14,273.11	77.98	889.16	14,192.82	371.47	525.41	NO	0.53	30,330.49
A. Mineral industry	6,249.48								6,249.48
B. Chemical industry	4,931.56	61.41	39.10	2.55	172.90	NO	NO	NO	5,207.50
C. Metal industry	2,572.86	10.68	6.19	2.29	15.07	109.75			2,716.84
D. Non-energy products from fuels and solvent use	519.22	NO,IE	NO,NE,IE						519.22
E. Electronic Industry				21.18	NO,IE	NO,IE	NO	0.53	21.71
F. Product uses as ODS substitutes				14,166.81	NO				14,166.81
G. Other product manufacture and use	NO	NO	843.87		183.51	415.66			1,443.04
H. Other	NO,NE,IE	5.89	NO						5.89

Greenhouse Gas Source and Sink Categories	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
					CO_2 equivalent (kt)				
3. Agriculture	1,283.09	25,891.43	14,374.59						41,549.10
A. Enteric fermentation		21,458.44							21,458.44
B. Manure management		4,226.81	2,814.79						7,041.59
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	11466.79						11,466.79
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	936.67								936.67
H. Urea application	343.95								343.95
I. Other carbon-containing fertilizers	NO								NO
J. Other	2.46	206.19	93.01						301.66
4. Land use, land-use change and forestry	-11,329.82	28.37	1,408.77						-9,892.68
A. Forest land	-18,211.77	2.31	144.65						-18,064.80
B. Cropland	10,971.23	0.02	461.97						11,433.23
C. Grassland	-8,861.80	17.78	33.24						-8,810.79
D. Wetlands	336.78	NO,NE,NA	0.30						337.07
E. Settlements	6,451.34	8.25	524.99						6,984.59
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-2015.60								-2,015.60
H. Other	NO	NO	NO						NO

Greenhouse Gas Source and Sink Categories	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
					CO_2 equivalent (kt)				
5. Waste	258.91	18,911.21	1,493.59						20,663.70
A. Solid waste disposal	NO,NE	14,261.40							14,261.40
B. Biological treatment of solid waste		1,193.62	728.03						1,921.65
C. Incineration and open burning of waste	258.91	10.45	39.63						308.98
D. Waste water treatment and discharge		3,445.75	725.93						4,171.67
E. Other	NO	NO	NO						NO
International bunkers									
Aviation									
Navigation									