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Report on the technical review of the third biennial report of the United Kingdom of Great Britain and Northern Ireland

Developed country Parties were requested by decision 2/CP.17 to submit their third biennial report to the secretariat by 1 January 2018. This report presents the results of the technical review of the third biennial report of the United Kingdom of Great Britain and Northern Ireland, conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention".

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Abbreviations and acronyms

AEA	annual emission allocation
Annex II Party	Party included in Annex II to the Convention
AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
BEIS	Department for Business, Energy and Industrial Strategy
BR	biennial report
CCC	Committee on Climate Change
CCS	carbon capture and storage
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTF	common tabular format
DEFRA	Department for Environment, Food and Rural Affairs
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GBP	pounds sterling
GCF	Green Climate Fund
GDP	gross domestic product
GHG	greenhouse gas
HFC	hydrofluorocarbon
ICF	International Climate Finance
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LCPD	Large Combustion Plants Directive (2001/80/EC)
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NF_3	nitrogen trifluoride
NIR	national inventory report
non-Annex I Party	Party not included in Annex I to the Convention
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N_2O	nitrous oxide
OECD	Organisation for Economic Co-operation and Development
OECD DAC	OECD Development Assistance Committee
ODA	official development assistance
PaMs	policies and measures
PFC	perfluorocarbon
reporting guidelines for supplementary information	"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. Part II: Reporting of supplementary information under Article 7, paragraph 2"
RED	Renewable Energy Directive (2009/28/EC)
RES	renewable energy sources
SF_6	sulfur hexafluoride

UNFCCC reporting guidelines on NCs	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications"
WAM	'with additional measures'
WEM	'with measures'
WOM	'without measures'

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the BR3[1] of the United Kingdom of Great Britain and Northern Ireland. The review was organized by the secretariat in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention", particularly "Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention" (annex to decision 13/CP.20).

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of the United Kingdom, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. The review was conducted from 4 to 9 June 2018 in London by the following team of nominated experts from the UNFCCC roster of experts: Ms. Gabriela Fischerova (Slovakia), Mr. Liviu Gheorghe (Romania), Ms. Marian Van Pelt (USA), Mr. Marcelo Rocha (Brazil), and Mr. Benon Yassin (Malawi). Ms. Fischerova and Mr. Rocha were the lead reviewers. The review was coordinated by Ms. Xuehong Wang (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the BR3 of the United Kingdom in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR3 was submitted on 30 December 2017, before the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were submitted on the same date, 30 December 2017.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by the United Kingdom in its BR3 mostly adheres to the UNFCCC reporting guidelines on BRs.

Table 1
Summary of completeness and transparency of mandatory information reported by the United Kingdom in its third biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
GHG emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Transparent	
Progress in achievement of targets	Complete	Mostly Transparent	Issues 1 and 2 in table 4; issues 1 and 2 in table 9

[1] The BR submission comprises the text of the report and the CTF tables, which are both subject to the technical review.

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
Provision of support to developing country Parties	Complete	Mostly Transparent	Issues 1–4 in table 10; issue 1 in table 13

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below.

II. Technical review of the information reported in the third biennial report

A. Information on greenhouse gas emissions and removals related to the quantified economy-wide emission reduction target

1. Technical assessment of the reported information

7. Total GHG emissions[2] excluding emissions and removals from LULUCF decreased by 40.9 per cent between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 39.2 per cent over the same period. Table 2 illustrates the emission trends by sector and by gas for the United Kingdom.

Table 2
Greenhouse gas emissions by sector and by gas for the United Kingdom for the period 1990–2016

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
Sector									
1. Energy	615 668.71	565 606.67	507 315.65	415 603.59	392 543.58	–36.2	–5.5	77.2	83.4
A1. Energy industries	236 989.52	199 606.26	194 189.55	134 013.35	111 115.57	–53.1	–17.1	29.7	23.6
A2. Manufacturing industries and construction	96 928.81	91 402.88	63 172.61	56 516.54	51 985.55	–46.4	–8.0	12.2	11.0
A3. Transport	122 30.15	130 013.66	121 526.67	121,841.95	124 320.74	1.8	2.0	15.3	26.4
A4. and A5. Other	117 931.01	122 488.18	114 913.21	92,230.11	95 251.91	–19.2	3.3	14.8	20.2
B. Fugitive emissions from fuels	41 689.22	22 095.69	13 513.61	11,001.64	9 869.81	–76.3	–10.3	5.2	2.1
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	66 538.33	40 587.37	35 603.84	33 762.30	30 766.61	–53.8	–8.9	8.3	6.5
3. Agriculture	49 998.65	46 728.25	41 703.60	41 922.28	42 002.31	–16.0	0.2	6.3	8.9
4. LULUCF	–2 128.01	–7 873.05	–14 440.14	–15 087.69	–14 543.19	583.4	–3.6	NA	NA
5. Waste	66 911.48	63 102.82	29 977.98	19 214.64	20 183.14	–69.8	5.0	8.4	4.3
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Gas [a]									
CO_2	596 239.91	556 235.24	495 083.45	404 926.00	381 304.51	–36.0	–5.8	74.8	81.0
CH_4	133 670.78	109 576.31	64 936.74	51 978.50	51 985.70	–61.1	0.0	16.8	11.0
N_2O	49 755.85	30 049.52	22,66.19	21 670.62	21 528.54	–56.7	–0.7	6.2	4.6

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated based on the 2018 annual submission, version 1.1.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
HFCs	14 391.43	9 874.86	16 499.13	16 054.75	15 272.26	6.1	–4.9	1.8	3.2
PFCs	1 651.49	596.78	287.71	327.23	353.94	–78.6	8.2	0.2	0.1
SF_6	1 279.29	1,817.65	686.43	457.58	507.03	–60.4	10.8	0.2	0.1
NF_3	0.42	1.69	0.27	0.44	0.48	16.2	10.0	0.0	0.0
Total GHG emissions without LULUCF	**799 117.17**	**716 025.11**	**614 601.06**	**510 502.80**	**485 495.64**	**–39.2**	**–4.9**	**100.0**	**100.0**
Total GHG emissions with LULUCF	**796 989.17**	**708 152.06**	**600 160.92**	**495 415.11**	**470 952.46**	**-40.9**	**-4.9**	**NA**	**NA**

Source: GHG emission data: The United Kingdom's 2018 annual submission, version 1.1.

[a] Emissions by gas without LULUCF and without indirect CO_2.

8. The decrease in total emissions was driven mainly by a decrease in emissions from the energy sector – particularly from power stations (IPCC category 1A1a) due to a significant switching from coal use to other, less carbon intensive fuels and renewables.

9. In brief, United Kingdom national inventory arrangements were established in accordance with EU legislation set out in Decision 280/2004/EC and the United Kingdom's "Greenhouse Gas Emissions Trading Scheme (Amendment) and National Emissions Inventory Regulations of 2005 and "Greenhouse Gas Emissions Trading Scheme (Amendment) Regulations" of 2014.

10. In 2016, BEIS was created from the Department of Energy and Climate Change and the Department for Business, Innovation and Skills and became the single national entity for the United Kingdom. BEIS has overall responsibility for the United Kingdom's GHG inventory and the national system and carries out this function on behalf of Her Majesty's Government and the devolved administrations (Wales, Scotland and Northern Ireland). BEIS is responsible for the institutional, legal and procedural arrangements for the national system and for the strategic development of the national inventory.

11. The United Kingdom's GHG inventory is compiled under contract to BEIS by a consortium led by the environment consultancy Ricardo Energy and Environment, emissions and removals in the LULUCF sector are estimated by the Centre for Ecology and Hydrology and Forest Research on behalf of BEIS. Emissions estimates from the energy supply sector, industrial processes sector and waste management sector are produced under the Ricardo Energy and Environment contract. Emissions from the agricultural sector are provided by Rothamsted Research under contract to DEFRA.

2. Assessment of adherence to the reporting guidelines

12. The ERT assessed the information reported in the BR3 of the United Kingdom and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Assumptions, conditions and methodologies related to attainment of quantified economy-wide emission reduction target

1. Technical assessment of the reported information

13. For the United Kingdom, the Convention entered into force on 21 March 1996. Under the Convention the United Kingdom committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020. The EU offered to move to a 30 per cent reduction target on the condition that other developed countries commit to a comparable target and developing countries contribute according to their responsibilities and respective capabilities under a new global climate change agreement.

14. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. The legislative package regulates emissions of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 using global warming potential values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU ETS.

15. The EU 2020 climate and energy package includes the EU ETS and the ESD. The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emissions cap has been put in place for the period 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from non-ETS sectors are regulated through member State specific targets that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020.

16. Under the ESD, the United Kingdom has a target of reducing its total emissions to 16.0 per cent below the 2005 level by 2020 for non-ETS sectors. National emission targets for non-ETS sectors for 2020 have been translated into binding quantified AEAs for the period 2013–2020. The United Kingdom's AEAs change following a linear path from 358,980.52 kt CO_2 eq in 2013 to 351,134.36 kt CO_2 eq in 2020[3].

17. The main strategic and regulatory framework with respect to climate change in the United Kingdom is the Climate Change Act (established in November 2008). It sets up a national legally binding framework for the reduction of GHG emissions by at least 80 per cent below the 1990 level by 2050 and provides the framework for domestic action to reduce GHG emissions by at least 34 per cent below the 1990 level by 2020. The main instrument used for ensuring the targets are met is the carbon budget (which sets limit on the quantity of GHG emissions that the United Kingdom can emit over a five-year period). At the end of 2017 (BR3), the United Kingdom had agreed five carbon budgets, namely 2008–2012, 2013–2017, 2018–2022, 2023–2027 and 2028–2032. The coverage of the targets set through the carbon budgets comprises the United Kingdom territory only and does not include Crown Dependencies or Overseas Territories. The devolved administrations in Scotland and Wales have passed their own legislation relating to emission reduction.

18. The carbon budgets cover the sectors covered by the ETS and non-ETS sectors, in addition to the impact of LULUCF, but exclude international aviation and shipping. Under the Climate Change Act 2008, at the end of a budget period, having taken into account the advice of CCC and in consultation with the devolved administrations, the United Kingdom can bank some or all of any surplus from one carbon budget into the next budgetary period. So far, no banking has happened. It is expected that the targets set through the first three carbon budgets will be easily achieved through the policies in place. At the end of 2017, the United Kingdom established a Clean Growth Strategy setting out a comprehensive set of policies and proposals that aim to accelerate the pace of clean growth and help reaching the targets in the fourth and fifth carbon budgets.

2. Assessment of adherence to the reporting guidelines

19. The ERT assessed the information reported in the BR3 of the United Kingdom and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

[3] European Commission decision 2017/1471 of 10 August 2017 amending decision 2013/162/EU of 26 March 2013 to revise member States' AEAs for the period from 2017 to 2020.

C. Progress made towards the achievement of the quantified economy-wide emission reduction target

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

20. The United Kingdom provided information on its package of PaMs implemented, adopted and planned, by sector including references to the affected gases, in order to fulfil its commitments under the Convention and its Kyoto Protocol. The United Kingdom reported on its policy context and legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs.

21. The United Kingdom provided information on a set of PaMs similar to those previously reported, with a few exceptions. (e.g. Woodland Creation Planning Grant). The United Kingdom's overarching policy framework relating to energy and climate change remains its Climate Change Act of 2008 (which set the basis for the United Kingdom's domestic carbon budgets). The United Kingdom also provided information on changes made since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target. Since the BR1, the former Department of Energy and Climate Change has been transformed to BEIS, responsible for setting domestic climate strategies and policies in terms of mitigation, and also for promoting the international action to mitigate climate change. Adaptation at the national level in England remains under the responsibility of DEFRA. Responsibility for adaptation action in Scotland, Wales and Northern Ireland is devolved to their respective governments. BEIS coordinates the United Kingdom's policy on climate change at official level through inter-departmental committees chaired by BEIS. A Cabinet Committee chaired by the Chancellor of the Exchequer makes decisions at ministerial level. During the review, the ERT has learned that although coordination and cooperation among different departments and different administrations (Scottish, Welsh and Northern Ireland) is not very formalised, it works well and delivers required action.

22. The United Kingdom reported on its self-assessment of compliance with emission reduction target and national rules for taking action against non-compliance. The Climate Change Act requires that CCC (as well as the Government) reports annually to the Parliament on the progress in delivering carbon budgets. So far, all results and projections reflect an overachievement of the targets for the first, second and third carbon budget, covering the period 2008–2022.

23. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO_2 emissions from cars and vans, the CCS directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

24. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities) that produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N_2O emissions from chemical industries, PFC emissions from aluminium production and CO_2 emissions from industrial processes (since 2013).

25. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and includes binding annual targets for each member State for 2013–2020.

26. The United Kingdom did not emphasize the EU-wide mitigation actions that are under development, such as the legislative proposal by the European Commission to reform the EU ETS for the period after 2020, which is being discussed in the trilogue process, which is an informal meeting for EU's ordinary legislative procedures, that involves representatives from the European Parliament, Council of the EU, and European Commission, with the goal of reaching a common position between the European Parliament and the Council before it can be adopted. However, the United Kingdom declared it is considering the future participation in the EU ETS after its exit from the EU and is firmly committed to carbon pricing as an emissions reduction tool whilst ensuring energy and trade intensive businesses are appropriately protected from any detrimental impacts on competitiveness.

27. The Government of the United Kingdom introduced both policies at the level of the United Kingdom and national policies for England only to achieve its targets under the ESD and domestic emission reduction targets. The key policies reported are the new energy supply policies, Building Regulations Part L and Renewable Transport Fuel Obligation (see Table 3 below). The mitigation effect of the new energy supply policies (about 36,170.12 kt CO_2eq in 2020) is the most significant. Other policies that have delivered significant emission reductions are Building Regulations Part, expected to deliver about 10,140.43kt CO_2eq in 2020 and Renewable Transport Fuel Obligation, expected to deliver about 5,817.91 ktCO_2eq in 2020.

28. The United Kingdom highlighted the domestic mitigation actions that are under development, such as Carbon Capture, Use and Storage, use of more Nuclear Power and Electrification of Road Transportation. All of them target rather the achievement of the carbon budgets four and five (2033–2027 and 2018–2032), as the target for 2020 is considered to be easily achievable through the policies already in place. These mitigation actions are among the most significant and are critical for the United Kingdom to attain its 2032 emission reduction target.

Table 3
Summary of information on policies and measures reported by the United Kingdom

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	Carbon budget, Clean Growth Strategy, EU ETS; ESD	NE	NE
Energy	New Energy Supply policies: Policies targeting to increase the proportion of low carbon (Nuclear, CCS) and renewables electricity generation	36 170.12	43 239.98
Transport	Car Fuel Efficiency Policies: Policies targeting to improve fuel efficiency and reduce CO_2 emissions of cars.	4 882.37	17 296.99
	Renewable Transport Fuel Obligation, (RTFO) - Increase target to meet RED: Policies targeting to reduce the fossil carbon content of transport fuels	5 817.91	5 400.49
	Renewable Transport Fuel Obligation, (RTFO) - current 5% by volume: Policies targeting to reduce the fossil carbon content of transport fuels	2 343.59	2 149.63
Renewable energy	Renewable Heat Incentive: Policies targeting to encourage the generation of renewable heat in all sectors from large industrial sites down to the household level.	2 401.29	2 417.63
Energy efficiency	Building Regulations Part L (2002+2005/6): Policies targeting to improve energy efficiency of buildings	10 140.43	5 110.46
	Building Regulations 2010 Part L: Policies targeting to improve energy efficiency of buildings	5 382.24	4 831.97
	Smart Metering: Policies targeting to reduce consumption of electricity and gas though provision of better management information.	2 058.36	1 851.04

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
IPPU	F-gas regulation 2014: Implementation of F-Gas Regulation (EC 517/2014) to reduce emissions of fluorinated greenhouse gases.	4 569.40	12 343.20
Agriculture	Agricultural Action Plan: Policies targeting to reduce emissions from farming.	2 428.57	3 197.15
LULUCF	Recent forestry policies: Increase afforestation	–178.28	9.82
Waste	Waste measures: Increase recycling/reuse and reduce harmful disposal. These include the Waste Framework Directive (2008/98/EC), Landfill Directive (1999/31/EC), Waste Incineration Directive (2000/76/EC) and the United Kingdom Landfill Tax, an escalating tax on biodegradable waste.	IE[a]	IE

Note: The estimates of mitigation impact are estimates of emissions of CO_2 or CO_2 eq avoided in a given year as a result of the implementation of mitigation actions.

[a] The United Kingdom explained that due to the complexity of the estimation methods, individual effects could not be estimated; therefore, the Party could notice the decreasing effects but could not very easily differentiate between the effects of this set of policies and other sets of policies.

29. Through the Climate Change Act, the Government of the United Kingdom has set a target for 2050 and a path to achieve the objective. It has also created a formal set-up for monitoring of progress and advisory, in the form of the CCC – an independent professional advisory committee. The Climate Change Act requires the government to set legally-binding 'carbon budgets' (caps on the amount of GHGs in the United Kingdom over a five-year period) towards the 2050 target. Budgets must be set twelve years in advance to allow policymakers, businesses and individuals enough time to prepare.

30. CCC advises on the appropriate level of each carbon budget, reports annually to Parliament on the progress made in reducing greenhouse gas emissions and the further progress needed to meet future targets and publishes its advice and reasons for that advice. Once a carbon budget has been set, the Climate Change Act places an obligation on the Government to prepare policies to ensure the budget is met.

31. The ERT noted that the United Kingdom has a robust system for climate change policy making, implementation, monitoring and evaluation. When monitoring progress towards meeting carbon budgets, the United Kingdom monitors actual emissions against the best estimate for the cost-effective path to the 2050 target, on which the carbon budgets have been based. This cost-effective path reflects the actions needed in each sector (e.g. uptake of renewable electricity generation, insulation, electric vehicles) in order to reduce emissions and to be on track to meet the 2050 target at least cost; however, baseline projections are also uncertain; therefore, the United Kingdom runs the estimation models recurrently so that it can reduce the uncertainties and increase the precision of its estimates. For some of the sectors, estimation is more difficult and it is assumed that for these sectors (e.g. agriculture), decarbonization will intensify later.

(b) Policies and measures in the energy sector

32. **Energy supply**. The energy sector is the main source of GHG emissions in the United Kingdom, with 29.1 per cent (145.50 Mt CO_2 eq) of overall emissions in 2015. The value is below the share of the sector in 1990 (34.8 per cent) and decreased by 48.0 per cent in terms of GHG emissions. Also, between 1990 and 2016, final energy consumption decreased by 4.0 per cent, from 147.30 m toe to 140.70 m toe. The energy mix (electricity) in the United Kingdom has changed over time, from about 75.0 per cent fossil fuel (coal accounted for 69.0 per cent) in 1990, to about 53.0 per cent fossil fuel (coal accounted for 9.0 per cent) in 2016. This change is mainly due to the New Energy Supply policies implemented, such as EU ETS, EU RED Directive with more RES capacities having been installed, EU LCP Directive which has been conducted to close several coal fired units and fuel switch in others (coal to biomass/coal to natural gas), but also to structural changes in the economy and to the

stable demand for energy in space heating. Policies such as the CCS are expected to deliver results after 2020, as they are not fully implemented at commercial scale and, in reality, suffering a drawback in 2015. Nuclear energy has also contributed to the decrease of GHG emissions in energy supply, given the reduced number of outages of the existing power units. Other effective policies implemented by the United Kingdom include the Carbon Price Floor (setting a minimum carbon price for the electricity generated from fossil fuels, in the form of a carbon tax, which is higher than the price for the EU allowance on the ETS market) and the Electricity Market Reform, which involves (adding a cost to emitting CO_2 to set a floor to the carbon price for electricity supply.

33. **Renewable energy sources**. Electricity generation from RES has increased from about 2.0 per cent (1990) to about 24.6 per cent (2016), in the total electricity generation, indicating the success of the implemented policies. Further increase of RES is expected based on the implemented instruments (regulation and incentives), mainly due to the EU RES Directive; however, one of the main policies in the United Kingdom was the Renewable Obligation, a market-based support mechanism. It worked by placing an obligation on licensed electricity suppliers to submit a certain number of Renewables Obligation certificates to Ofgem, the administrator of the scheme, in respect of each megawatt hour of electricity supplied each year. In April 2017, this policy has been replaced by the Contracts for Difference policy.[4] Feed-in tariffs scheme was also introduced in 2010 to encourage deployment of small-scale (up to 5MW) low-carbon technologies in photovoltaics, wind, hydro, anaerobic digestion and micro combined heat and power (less than 2 kW). The other key policy is the Electricity Market Reform which provides support for low-carbon technologies in the short to medium term, working towards a long-term vision of a competitive market where all technologies participate on a level playing field without direct financial support.

34. **Energy efficiency**. The United Kingdom's energy efficiency policy goes beyond the EU energy policy, both in terms of targets, sectors and instruments for achievement, and it includes both public and private sectors as well as domestic and economic activities. The main energy-efficiency regulation is driven by the EU energy-efficiency directive (2012/27/EU) and the EU energy efficiency in buildings directive (2012/27/EU); however, the United Kingdom has further enhanced these requirements by creating adapted instruments including the Carbon Reduction Commitment Energy Efficiency Scheme; the Energy Companies Obligation, which replaced the Carbon Emissions Reduction Target and the Community Energy Saving Programme for their implementation. Details on the effects of energy-efficiency policies are provided in the sectoral policies listed below.

35. **Residential and commercial sectors**. Residential sector emissions decreased with approximately 35.0 per cent between 1990 (171.50 Mt CO_2 eq) and 2015 (112.10 Mt CO_2 eq). This net change was the result of interactions between three major contributing factors over the decade: a growth in demand for underlying energy services (such as warm homes, hot water and home entertainment); energy efficiency policies improvement; and reduction in carbon intensity of grid electricity. The highest impact measures are related to Energy Performance of Buildings Directive (i.e. Energy Efficiency Obligations and Building Regulations and boiler replacement standards), Smart Metering and billing which also play a key role in the household sector in terms of expected savings, as well as product policy and the Market Transformation Programme, which are related to the Energy Labelling of Household Appliances Directive. In addition, the energy suppliers have an obligation to deliver energy efficient measures to householders via the Energy Companies Obligation.

36. Public sector emissions fell from an estimated 31.50 Mt CO_2 eq in 1990 to 14.60 Mt CO_2 eq in 2015. This was largely driven by a reduction in the use of oil in this sector, but also due to the implementation of the PaMs such as smart metering. In 2015, emissions from the business sector (businesses, except industrial processes) were estimated to be 25.9 per cent below 1990 levels, representing an estimated 17.0 per cent of total emissions. A number of factors contributed to this decrease but it was primarily due to a reduction in emissions from industrial combustion (including iron and steel). The main policies implemented are:

[4] https://en.wikipedia.org/wiki/Contract_for_difference.

the Carbon Reduction Commitment Energy Efficiency Scheme, which is a mandatory carbon emissions reduction scheme in the United Kingdom that applies to large energy-intensive organisations in the public and private sectors); the Climate Change Levy, which is a carbon tax that is added to electricity and fuel bills, and is paid by industrial, commercial, agricultural and public services for use of electricity, gas and solid fossil fuels; and the Climate Change Agreements, which are voluntary agreements made by industry and the Environment Agency to reduce energy use and carbon dioxide (CO_2) emissions.

37. **Transport sector**. Transport accounted for around 24.0 per cent of the United Kingdom's GHG emissions in 2015, representing an emission increase of 1.8 per cent since 1990, with road transport being the most significant source of emissions in the sector. Also, in 2015, transport accounted for the largest share of all final energy consumption in the United Kingdom at 37.0 per cent. The slow-down in the rate of increase is mainly due to technology advancements (more efficient engines) (and car park renewal). The United Kingdom's long-term strategy to reduce transport emissions includes the Renewable Transport Fuels Obligation (RTFO), which requires 9.7 per cent of transport fuel sold in the United Kingdom to come from renewable sources by 2020, rising to 12.4 per cent in 2032. As the transport sector holds such a high share in the total GHG emissions, the United Kingdom is implementing a set of PaMs that envisage: the acceleration of take up of Ultra Low Emissions Vehicles, which involves financial support for buying or installing electric vehicles and charging stations through Electric Vehicle Home Charge Scheme and Workplace Charging Scheme; development of hydrogen infrastructure and use; and other measures, including low-carbon alternatives such as using public transportation, walking and cycling, and the electrification of the railways, where this proves to be cost-effective.

38. The NC7 includes information on how the United Kingdom promotes and implements the decisions of the International Civil Aviation Organization and the IMO to limit emissions from aviation and marine bunker fuels. The United Kingdom has volunteered to participate in the Carbon Offsetting and Reduction Scheme for International Aviation from the beginning, in 2021; in international shipping, the United Kingdom continues to engage in the IMO activities and in the generation and adoption of an Initial Strategy (Roadmap for Developing a Comprehensive IMO Strategy on Reduction of GHG Emissions from Ships) in spring 2018, and a Revised Strategy in spring 2023.

39. **Industrial sector**. Since 1990, emissions from business and industry have almost halved, mainly due to efficiency gains and a shift in manufacturing to cleaner fuels, as well as changes to the industrial structure of the economy. Much of this reduction has taken place in the most energy intensive industries (e.g. each tonne of steel produced in the United Kingdom requires 40.0 per cent less energy to produce than 40 years ago). In addition, the energy efficiency of non-domestic buildings has been improved since 1990, resulting in emissions 18.0 per cent lower in 2015. The main policy measures at the level of the United Kingdom are Climate Change Agreements and the Climate Change Levy, a combination of energy taxation and tax relief connected to voluntary agreements.

(c) Policies and measures in other sectors

40. **Industrial processes**. Industrial processes emissions have decreased by an estimated 79.0 per cent between 1990 and 2015, from 60.00 to 12.70 Mt CO_2 eq. The largest reductions are due to emissions trading schemes and 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 (Regulation across the EU). Also, Implementation of the F-Gas Regulation (Regulation (EU) No 517/2014 of the European Parliament and of the Council on fluorinated greenhouse gases, specifying details on phasing out F-gases) has contributed to the decrease of GHG emissions.

41. **Agriculture**. Agriculture emissions decreased slightly, from 59.30 to 49.4 Mt CO_2 eq, between 1990 and 2015. The fall in emissions is the result of decreasing animal numbers and fertilizer use, through the PaMs implemented by the United Kingdom. The most representative PaM for this sector is the GHG Action Plan, a voluntary initiative to reduce the level of GHG emissions produced from agriculture in England, expected to contribute to a reduction of 3 Mt CO_2 eq in 2020. The action plan has been reviewed in 2016 in order to focus on the measures already proven effective. In addition, in the perspective of the

withdrawal of the United Kingdom from the EU, the Party is expecting to design and implement a new agriculture supporting mechanism that will deliver better environmental outcomes, including climate change mitigation and adaptation. Agriculture policymaking is devolved to the Scottish Government, Welsh Government and Northern Ireland Executive, which will need to determine how to support their farmers and land managers after the United Kingdom leaves the EU.

42. **LULUCF**. LULUCF GHG emissions decreased from a net source of 5.7 Mt CO_2 eq to net removals of 7.4 Mt CO_2 eq, between 1990 and 2015. The trend is mainly driven by the change of the age structure of the forest stock. In the future the United Kingdom projects a reduction of the net sink due to ageing of forests and associated harvesting; however, the Government of the United Kingdom and the devolved administrations have each developed policy frameworks to reduce all GHG emissions from the forestry and land management sector, largely based on voluntary measures and support schemes. The "Recent forestry policies" deliver negative savings in the first years (due to the specific planting works) and are projected to deliver sinks only at the 2030s horizon, demonstrating the long term character of the measure. The revised United Kingdom Forestry Standard (2017) is a regulatory and information measure that aims at enhancing removals and reducing emissions through woodland creation and sustainable forest management. The standard, which applies across the United Kingdom, addresses sustainable forest management and includes guidelines for climate change adaptation and mitigation.

43. **Waste management**. In the waste management sector, between 1990 and 2015, GHG emissions decreased by 73.0 per cent, from 66.9 Mt CO_2 eq to 18.4 kt CO_2 eq. The change was mainly driven by policies implemented in accordance with the waste hierarchy, which is a legal requirement of the 2008 EU waste framework directive. The United Kingdom waste policy contributes to emission reductions via five routes: reductions in CH_4 emissions from landfills; emission reductions from more efficient use of materials; waste prevention; reuse and recycling; and energy recovery from waste, which offsets fossil fuel energy generation elsewhere in the economy. CH_4 emissions from biodegradable waste in landfills alone account for about 27 per cent of all CH_4 emissions and 3 per cent of all GHG emissions. A combination of permit conditions and financial incentives for capturing CH_4 from landfills and anaerobic digestion has driven investment to significantly increase capture of CH_4 at landfill sites.

(d) Response measures

44. The United Kingdom reported on the assessment of the economic and social consequences of response measures. The United Kingdom presented several initiatives aimed at minimizing adverse impacts, including its support for the IPCC, acceleration of development of (global) clean energy and bundling support for tackling deforestation. The United Kingdom has developed studies e.g. on approaches to avoid indirect land use change impacts of biofuels from biofuels production, on the sustainability of feedstock, on embedded carbon emissions. Also, the United Kingdom explained that its ICF has providing GBP 3.87 billion of climate finance from 2011 to 2016, focusing on helping the poorest people adapt to the effects of climate change, helping to encourage low-carbon development, and protecting the world's forests and the livelihoods of the people who depend on them. Several other financing programmes have run meanwhile e.g. GBP 75 million into Green Mini-Grids Africa – aiming at increasing energy access in Africa through creating expanding deployment of clean energy mini-grids, GBP 15 million grant over the period 2012–2018 to support the growth of Silvopastoral Systems in Colombia to reduce greenhouse gas emissions, improve the livelihood of farmers, protect local forests and increase biodiversity, help 72 developing countries pilot low-emission and climate-resilient development, through the Clean Technology Fund, etc.

(e) Assessment of adherence to the reporting guidelines

45. The ERT assessed the information reported in the BR3 of the United Kingdom and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 4.

Table 4
Findings on the mitigation actions and their effects from the review of the third biennial report of the United Kingdom

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 7 Issue type: transparency Assessment: recommendation	The United Kingdom provided information on changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards its economy-wide emission reduction target; however, institutional evolution, as well as relationships between the different levels of the public administration was not caught in the description. During the review the United Kingdom explained that in 2016 BEIS was created as a result of a merger between the Department of Energy and Climate Change and Department for Business, Innovation and Skills, bringing together responsibility for business, industrial strategy, and science and innovation with energy and climate change policy, merging the functions of the former Department for Business, Innovation and Skills and DECC; also the relationship between the Government of the United Kingdom and the devolved administrations has been explained in a more clear way; all these explanations contributed to better understanding responsibilities for policy formulation, monitoring and verification with respect to climate change. In order to enhance the transparency of its reporting, the ERT recommends that the United Kingdom provides in its next submission a description on changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards its economy-wide emission reduction target.
2	Reporting requirement specified in paragraph 6 Issue type: transparency Assessment: recommendation	The United Kingdom reported on the estimated mitigation impact of some PaMs for 2020 and 2030. However, it did not give an estimated mitigation impact for several of its PaMs, mostly in the Agriculture, Waste and LULUCF sectors, in CTF Table 3 During the review, the United Kingdom explained that it could not quantify some impacts due to the complexity of the methodologies used for estimating emission reduction for the particular PaMs. The ERT therefore recommends that the United Kingdom improve the transparency of its reporting by providing the estimated impact of the PaMs for each individual PaM and year or provide clear explanations as to why this may not be possible in its next BR.
3	Reporting requirement specified in paragraph 6 Issue type: transparency Assessment: encouragement	The United Kingdom provided information on its mitigation actions, including on the PaMs it has implemented or plans to implement to achieve its economy-wide emission reduction target. However, the Party has not provided additional information on the cost of mitigation actions and the relevant timescale, as suggested in footnote (e) of the CTF Table 3. During the review, more information and explanations on the cost and the relevant timescales were provided contributing to the clarity of reporting. The ERT encourages the United Kingdom to improve the transparency of its reporting by including information on the cost and timescale of the mitigation actions in CTF Table 3.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on BRs.

2. Estimates of emission reductions and removals and the use of units from market-based mechanisms and land use, land-use change and forestry

(a) Technical assessment of the reported information

46. For 2014 the United Kingdom reported in CTF table 4 annual total GHG emissions excluding LULUCF of 526,370.27 kt CO_2 eq, which is 33.9 per cent below the 1990, base-year level. In 2015 emissions from non-ETS sectors relating to the target under the ESD amounted to 315,733.30 kt CO_2 eq.

47. For 2015 the United Kingdom reported in CTF table 4 annual total GHG emissions excluding LULUCF of 506,765.38 kt CO_2 eq, which is 36.4 per cent below the 1990, base-year level. In 2015 emissions from non-ETS sectors relating to the target under the ESD amounted to 318,502.05 kt CO_2 eq.

48. On its use of units from LULUCF activities, the United Kingdom reported in CTF tables 4 and 4(a) that in 2014 and 2015 it did not use such units to offset its GHG emissions. The United Kingdom reported that it does not intend to use units from market-based mechanisms towards the achievement of its 2020; in 2015, the United Kingdom has retired a number of units equivalent to 2,003,378.41 ktCO^2eq, as part of the compliance procedure for the first Kyoto Protocol true-up period. Table 5 illustrates the United Kingdom's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 5
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry by the United Kingdom to achieve its target

Year	*Emissions excluding LULUCF (kt CO_2 eq)*	*Contribution of LULUCF (kt CO_2 eq)*[a]	*Emissions including contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*
1990	796 815.80	NA	NA	NA
2010	615 675.37	NA	NA	NA
2011	567 503.92	NA	NA	NA
2012	584 243.08	NA	NA	NA
2013	568 763.78	NA	NA	NA
2014	526 370.27	NA	NA	NA
2015	506 765.38	NA	NA	2 003 378.41[b]
2016	485 495,64	NA	NA	NA

Source: The United Kingdom's BR3 and CTF tables 1, 4, 4(a)I, 4(a)II and 4(b).

[a] The EU's unconditional commitment to reduce GHG emissions by 20 per cent below the 1990 level by 2020 does not include emissions/removals from LULUCF.

[b] The United Kingdom reported, in its CTF Table 4, AAUs retired as part of the compliance procedure for the first Kyoto Protocol true-up period.

49. In assessing the progress towards the achievement of the 2020 target, the ERT noted that the United Kingdom's emission reduction target for non-ETS sectors is 16.0 per cent below the 2005 level. As discussed above, in 2015 the United Kingdom's annual total GHG emissions excluding LULUCF emissions from non-ETS sectors were 9.0 per cent (or 31,428.92 kt CO_2 eq) below the AEA under the ESD. In addition, the ERT noted that the use of LULUCF and the market-based mechanisms is not intended and/or included.

50. The ERT noted that the United Kingdom is making progress towards its emission reduction target by implementing mitigation actions that are delivering significant emission reductions. On the basis of the results of the projections, the ERT also noted that the Party is making progress towards achieving its target under the Convention.

(b) Assessment of adherence to the reporting guidelines

51. The ERT assessed the information reported in the BR3 of the United Kingdom and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

52. The United Kingdom reported updated projections for 2020 and 2030 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by United Kingdom includes implemented and adopted PaMs until July 2017.

53. The United Kingdom did not present a WAM scenario. During the review week, the Party has indicated that it would be possible to elaborate such scenario for the next BR and presented preliminary results estimating using the same methodology of the WEM scenario. It also did not present a WOM scenario as the United Kingdom considers that within the current projections methodology it would not be possible to remove the effects of all PaMs from historical data.

54. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively in each case) for 1990–2030. The projections are also provided in an aggregated format for each sector as well as for a Party total using global warming potential values from the AR4.

55. The United Kingdom did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.

56. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately and were not included in the totals.

(b) Methodology, assumptions and changes since the previous submission

57. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the BR2. Projections related to CO_2 emissions from energy are estimated annually using an "Energy and Emissions Projections (EEP) model suite", composed of: (1) Final energy demand model; (2) Dynamic Despatch model; and (3) Price and Bills model. Additionally, other emissions are estimated exogenously and incorporated to the projections including all non-CO_2 emissions from agriculture, waste and LULUCF (estimated by DEFRA and Centre for Ecology and Hydrology).

58. To prepare its projections, United Kingdom relied on the following key underlying assumptions: GDP growth rate; population growth; house-holds growth; fossil fuel prices (crude oil, gas and coal); EU ETS carbon price; electricity generation carbon price and exchange rates (pounds sterling to United States dollars and pounds sterling to euros). These variables and assumptions were reported in CTF table 5. In most cases, they are forecasts (public available) made by the United Kingdom's Office for Budget Responsibility and Office for National Statistics, supplemented by International Monetary Fund projections of world growth. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. Projections were combined from estimates made for England, Scotland, Wales and Northern Ireland.

59. United Kingdom provided information in CTF table 5 on assumptions, methodologies, models and approaches used and on the key variables and assumptions used in the preparation of the projection scenarios. To explain the changes, United Kingdom provided supporting documentation. United Kingdom also provided information on sensitivity analyses.

60. Sensitivity analyses were conducted for a number of important assumptions, such as low and high fossil fuel prices and low and high GDP rates for the United Kingdom. As result, it is projected that in 2020, the United Kingdom's GHG emissions will be between 47 per cent and 52 per cent below 1990 levels, with the central estimate 50 per cent below.

(c) Results of projections

61. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 6 and the figure below. During the review week, the United Kingdom presented the latest projections produced for national reporting (EEP, 2018). According to this report, by 2020 emissions are projected to be 50 per cent below 1990 levels in the reference case (assuming implemented, adopted and agreed policies).

Table 6
Summary of greenhouse gas emission projections for the United Kingdom

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
Kyoto Protocol base year[b]	803 191.32	NA	
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020)[c]	2 744 937.33		
Quantified economy-wide emission reduction target under the Convention[d]	NA	NA	NA
Inventory data 1990[e]	799 117.17	NA	NA
Inventory data 2016[e]	485 495.64	–37.8	–37.8
WEM projections for 2020[f]	425 84.10	–47.0	–47.0
WEM projections for 2030[f]	389 076.80	–51.0	–51.0

[a] "Base year" in this column refers to the base year used for the target[s] under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2016/ISO.

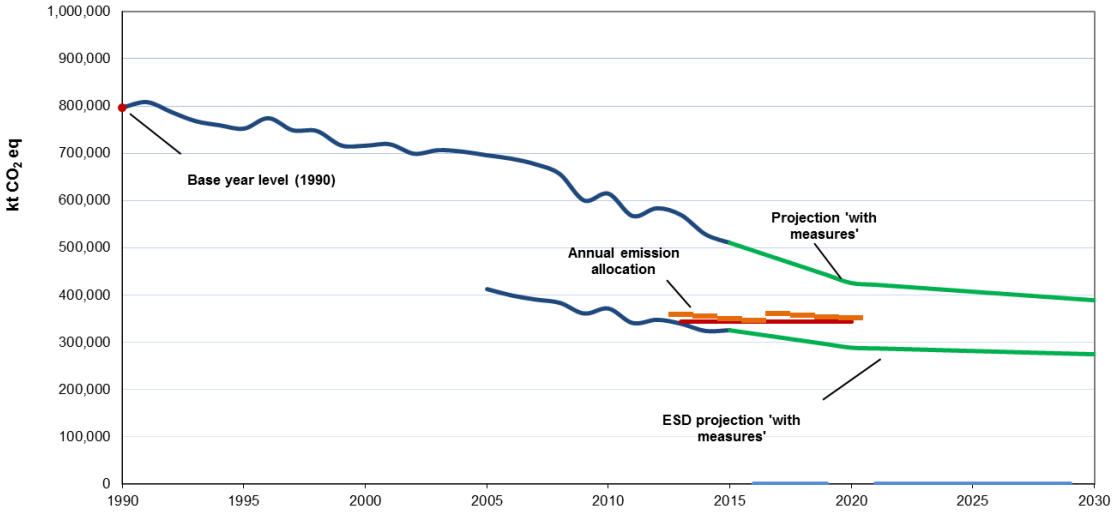
[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target of the EU and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. The target for non-ETS sectors is -16.00 per cent for United Kingdom under the ESD. The value presented in this line is based on annex II to European Commission decision 2013/162/EU and as adjusted by Commission implementing decision 2013/634/EU that established the assigned amount for the EU MS and divided by 8 years to calculate the annual emission level.

[d] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

[e] From United Kingdom's 2018 annual inventory submission.

[f] From United Kingdom's NC7 and/or BR3.

Greenhouse gas emission projections reported by United Kingdom



Sources: (1) data for the years 1990–2016: United Kingdom's 2018 annual inventory submission, version 1.1; total GHG emissions excluding LULUCF; (2) data for the years 2016–2020/2030: United Kingdom's NC7 and BR3; total GHG emissions excluding LULUCF.

62. For the United Kingdom, total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 425,484.10 and 389,076.80 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 47.0 per cent and 51.0 per cent, respectively, below the 1990 level. The 2020 projections suggest that United Kingdom will continue contributing to the achievement of the EU target under the Convention (see para. 13 above).

63. United Kingdom's target for non-ETS sectors is to reduce its total emissions by 16.0 per cent below the 2005 level by 2020 (see para. 16 above). United Kingdom's AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 358,741.69 kt CO_2 eq in 2013 to 350,926.22 kt CO_2 eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 287,955.04 kt CO_2 eq by 2020. The projected level of emissions under the WEM scenario is 17.9 per cent below the AEAs for 2020. The ERT noted that this suggests that United Kingdom expects to meet its target under the WEM scenario.

64. In addition to its target for non-ETS sectors. United Kingdom committed itself to achieving a domestic target of a 34 per cent reduction in emissions below the 1990 level by 2020. The projections indicate that United Kingdom expects to meet its domestic target.

65. The domestic target is presented as "carbon budgets" set under the 2008 Climate Change Act. According to the 2017 edition of the EEP (published January 2018), the United Kingdom met the first carbon budget (2008–12) with headroom of 36 Mt CO_2 eq and is projected to meet the second (2013–17) and third (2018–22) carbon budgets with headroom of 125 and 143 MtCO_2 eq respectively. There are projected shortfalls against the fourth (2023–27) and fifth (2028–32) carbon budgets of 64 Mt CO_2 eq and 116 Mt CO_2 eq respectively.

66. United Kingdom presented the WEM scenarios by sector for 2020 and 2030, as summarized in table 7.

Table 7
Summary of greenhouse gas emission projections for United Kingdom presented by sector

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
		2020	*2030*	*1990–2020*	*1990–2030*
Sector	*1990*	*WEM*	*WEM*	*WEM*	*WEM*
Energy (not including transport)	487 601.60	237 549.10	214 835.30	–51.3	–55.9
Transport	123 029.30	117 135.80	109 398.60	–4.8	–11.1

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
		2020	*2030*	*1990–2020*	*1990–2030*
Sector	*1990*	*WEM*	*WEM*	*WEM*	*WEM*
Industry/industrial processes	59 950.00	10 013.70	9 030.30	–83.3	–84.9
Agriculture	59 309.80	46 862.90	44 583.80	–21.0	–24.8
LULUCF	5 700.10	–11 081.20	–6 711.00	–294.4	–217.7
Waste	66 925.10	13 922.60	11.229.00	–79.1	–83.2
Other (specify)					
Total GHG emissions without LULUCF	**796 815.80**	**425 484.10**	**389 076.80**	**–46.6**	**–51.2**

Source: United Kingdom's BR3 CTF table 6.

67. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy and waste sector, amounting to projected reductions of 250.052.50 kt CO_2 eq (–51.28 per cent) and 53.002.50 kt CO_2 eq (–79.09 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario remains the same.

68. United Kingdom presented the WEM scenarios by gas for 2020 and 2030, as summarized in table 8.

Table 8
Summary of greenhouse gas emission projections for United Kingdom presented by gas

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
		2020	*2030*	*1990–2020*	*1990–2030*
Gas	*1990*	*WEM*	*WEM*	*WEM*	*WEM*
CO_2	595 297.38	346 464.04	322 856.75	–41.8	–45.8
CH_4	135 330.83	46 785.31	41 183.56	–65.4	–69.6
N_2O	48 865.15	20 499.00	20 039.82	–58.1	–59.0
HFCs	14 391.43	11 096.91	4 311.03	–22.9	–70.0
PFCs	1 651.53	256.95	256.97	–84.4	–84.4
SF_6	1 279.06	381.84	428.70	–70.2	–66.5
NF_3	0.42	0.00	0.00	–100.0	–100.0
Total GHG emissions without LULUCF	**796 815.80**	**425 484.10**	**389.076.80**	**–46.6**	**–51.2**

Source: United Kingdom's BR3 CTF table 6.

69. For 2020 the most significant reductions are projected for CO_2 and CH_4 emissions: 248,833.34 kt CO_2 eq (-45.8 per cent) and 88,545.52 kt CO_2 eq (–69.6 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario remains the same.

70. The United Kingdom doesn't present a WOM scenario because within the current projections methodology it would not be possible to remove the effects of all PaMs from historical data.

(d) Assessment of adherence to the reporting guidelines

71. The ERT assessed the information reported in the BR3 of United Kingdom and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 9.

Table 9
Findings on greenhouse gas emission projections reported in the third biennial report of United Kingdom

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 34 Issue type: transparency Assessment: recommendation	Projections were presented on a sectoral basis (i.e. agriculture, business, energy supply, IP, LULUCF, public, residential, transport and waste management) on a tabular format. However, no explanations were given on trends and drivers by sector. The ERT recommend United Kingdom to include the results and explanations by sector in the next BR submission, as reported in NC7.
2	Reporting requirement specified in paragraph 35 Issue type: transparency Assessment: recommendation	Projections were presented on a gas-by-gas basis (CO_2, CH_4, N_2O and F gases) on a figure. However, no explanations were given on trends and drivers by gases. The ERT recommend United Kingdom to include the results and explanations by gas in the next BR submission, as reported in NC7.
3	Reporting requirement specified in paragraph 28 Issue: completeness Assessment: encouragement	The United Kingdom did not present a WAM scenario in its BR. During the review week, the United Kingdom has presented a WAM scenario elaborated for national reporting purposes. It was explained that such scenario could be adapted for the next BR submission using the same methodology used to WEM scenario. The ERT encourage the United Kingdom to include both a WEM and WAM scenarios in the next BR submission.
4	Reporting requirement specified in paragraph 35 Issue type: transparency Assessment: encouragement	The United Kingdom did not present projections of the indirect GHGs. The ERT encourages the United Kingdom to report emission projections for indirect GHGs in the next submission.
5	Reporting requirement specified in paragraph 36 Issue type: transparency Assessment: encouragement	The United Kingdom did not present emission projections related to fuel sold to ships and aircraft engaged in international transport separately. The ERT encourages the United Kingdom to report such emissions separately in the next submission.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs and on BRs.

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

1. Approach and methodologies used to track support provided to non-Annex I Parties

(a) Technical assessment of the reported information

72. In the BR3 the United Kingdom reported information on the provision of financial, technological and capacity-building support required under the Convention.

73. The United Kingdom provided details on what "new and additional" support it has provided and clarified how this support is "new and additional". The United Kingdom's definition is that ICF represents a new, dedicated climate commitment which is additional to historic (ODA) levels and has not diverted funds from existing development spending. The United Kingdom reports that it has put in place a dedicated ring-fence to ensure that climate finance is identifiable from non-climate ODA.

74. The United Kingdom reported the financial support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. It explained how it tracks finance for adaptation and mitigation using a dedicated ring-fence of its ODA budget for climate finance, ICF, which ensures climate finance is separate from non-climate ODA.

75. The BR3 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. The United Kingdom included information on how it has refined its approach to tracking climate support and methodologies. The BR3 includes a section on "Monitoring and Evaluation, Transparency, and how the United Kingdom has applied lessons learnt from its ICF to ensure project quality," wherein they describe the monitoring, evaluation and learning programme and results reporting framework.

76. The United Kingdom described the methodology and underlying assumptions used for collecting and reporting information on financial support, including the use of an extensive monitoring and evaluation system, which makes use of 16 Key Performance Indicators to assess ICF performance against intended outcomes. The methodology used for preparing information on international climate support is the ICF's Monitoring, Evaluation and Learning programme. The United Kingdom reported results based on this framework, ensuring that the scrutiny they use internally is also reflected in external reporting. The BR3 noted that the United Kingdom is committed to the avoidance of double counting, citing the role they have played in the Technical Working Group methodology used to enable OECD–consumer price index analysis of aggregate mobilization of private finance. They further note that they work closely with OECD in reporting climate finance, including through use of the Rio-Markers.

(b) Assessment of adherence to the reporting guidelines

77. The ERT assessed the information reported in the BR3 of the United Kingdom and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 10.

Table 10
Findings on the approach and methodologies used to track support provided to non-Annex I Parties from the review of the third biennial report of the United Kingdom

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 13 Issue type: transparency	The United Kingdom did not clarify how it has determined its resources as being new and additional. During the review, the United Kingdom asserted that ICF represents a new, dedicated climate commitment which is additional to historic (ODA) levels and has not diverted funds from existing development spending. The United Kingdom reports

	Assessment: recommendation	that it has put in place a dedicated ring-fence to ensure that climate finance is identifiable from non-climate ODA. Further, IDR.6 noted that the United Kingdom clarified that after the fifteenth session of the Conference of the Parties (United Nations Climate Change Conference in Copenhagen, Denmark, 2009), with its international cooperation being fully informed by climate change considerations, all funding additional to the level of funding in 2009 is to be considered "new and additional" finance. The ERT reiterates the recommendation that the United Kingdom improve transparency in reporting on how the Party determines that financial resources are "new and additional", by, e.g. providing information on the use of 2009 as threshold for determining new and additional financial resources.
2	Reporting requirement specified in paragraph 14 Issue type: Transparency Assessment: Recommendation	The ERT noted that although the United Kingdom provided information on its national approach for tracking financial support to developing countries, it is not clear how the United Kingdom assesses that this support is climate-specific. During the review, the United Kingdom provided additional details as to how the total ICF funding is allocated to dedicated climate-specific activities or programmes, and how the climate elements of broader development activities are parsed into climate-specific versus non-climate-specific elements. The ERT recommends that the United Kingdom improve the transparency of its description of its national approach for tracking financial support by including further information as provided during the review on how ODA funds are determined to be climate-specific.
3	Reporting requirement specified in paragraph 14 Issue type: transparency Assessment: recommendation	The ERT noted that while the United Kingdom indicated the use of a Monitoring, Evaluation and Learning programme to report results on the provision of technological and capacity-building support, the United Kingdom did not provide any further information on what the programme is, that is, what indicators or metrics are included in the programme, which limits the transparency of this topic. The description that the United Kingdom provided of its national approach for tracking the provision of technological and capacity-building support, it did not include information on indicators used and allocation channels tracked for that purpose. During the review, the United Kingdom provided additional details on the process used to measure, monitor, and verify the 16 Key Performance Indicators within programmes and when aggregated across all ICF activities. The ERT recommends that the United Kingdom improve the transparency of its description of the approach for tracking the provision of technological and capacity-building support by including information on indicators used and allocation channels tracked within the Monitoring, Evaluation and Learning programme.
4	Reporting requirement specified in paragraph 15 Issue type: transparency Assessment: recommendation	The information provided by the United Kingdom in CTF table 7(a) describes the financial support as "provided"; however, the updated CTF table requires reporting as either committed or disbursed, together with the methodology used. During the review, the United Kingdom explained that it classifies the spent figures in the CTF as 'provided' on the basis that this expenditure has been accounted for as spent against departmental budgets. The terms 'committed' and 'disbursed' can have different meanings under HMG spending definitions; e.g. disbursed could refer to a transfer of cash and can be accounted for differently compared to a transfer of budget. In this respect, the United Kingdom also noted the difficulties associated with consistent definitions of such terms and described its engagement in international activities that are working toward resolving this challenge, such as the Climate Finance Roadmap. The ERT recommends that the United Kingdom improve transparency of the information on financial support it has disbursed or committed together with the methodology used, including adopting the updated CTF table 7(a) FCCC/CP/2015/10/Add.2.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on BRs.

2. Financial resources

(a) Technical assessment of the reported information

78. The United Kingdom reported information on the provision of financial support required under the Convention, including on financial support provided, committed and pledged, allocation channels and annual contributions.

79. The United Kingdom indicated what "new and additional" financial resources it has provided and clarified how it has determined such resources as being "new and additional". The United Kingdom explains that ICF represents a new, dedicated climate commitment which is additional to historic (ODA) levels and has not diverted funds from existing development spending. The United Kingdom reports that it has put in place a dedicated ring-fence to ensure that climate finance is identifiable from non-climate ODA.

80. The United Kingdom described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation. The United Kingdom reported information on the assistance that it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. The United Kingdom's ICF helps developing countries mitigate and adapt to the impacts of climate change, reduce deforestation and pursue clean economic growth. ICF is focussed on transformational change, reflecting the scale of the challenge of climate change. The United Kingdom also notes that the scale of its commitment reflects its view that climate change is the biggest threat to the long-term eradication of global poverty, and that the impacts of climate change will hit the poorest hardest.

81. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, the United Kingdom reported that its climate finance has been allocated on the basis of providing support which is transparent, transformative, and in line with the needs and priorities of developing countries. The United Kingdom reports that it remains committed to promoting climate smart development consistent with the Global Goals and driving sustainable development and effective climate action. The United Kingdom, and Australia, working with other developed countries, produced the Roadmap at COP22, which committed to the joint developed country agreement to mobilize $100 billion of climate finance a year.

82. The United Kingdom describes how its finance has been allocated, including adaptation and mitigation and with detailed examples of programming in its priority areas of forestry, private finance, and carbon markets. The United Kingdom prioritizes the GCF, and is committed to ensuring that the GCF delivers maximum impacts; the United Kingdom notes that the GCF has a commitment to provide 50/50 allocation of resources for mitigation and adaptation, and that 50 per cent of the adaptation support is to be provided to particularly vulnerable countries. In terms of bilateral support, the United Kingdom supports initiatives to support decarbonization activities, raising capacity and build on the United Kingdom's low-carbon experience and expertise; and on assisting people to anticipate the impact of climate change, adapt to long term impacts, and absorb the effects through effective and rapid response. Table 11 includes some of the information reported by the United Kingdom on its provision of financial support.

Table 11
Summary of information on provision of financial support by the United Kingdom in 2015–2016
(Millions of United States dollars)

	Year of disbursement	
Allocation channel of public financial support	*2015*	*2016*
ODA[a]	4331.0	3343.4

Allocation channel of public financial support	*Year of disbursement*	
	2015	*2016*
Climate-specific contributions through multilateral channels, including:	765.5	361.6
Global Environment Facility	0	28.34
Least Developed Countries Fund	0	40.49
GCF	366.41	218.25
Other multilateral climate change funds	379.68	74.53
Climate-specific contributions through bilateral, regional and other channels	1168.9	1054.9

[a] *Sources*: (1) Query Wizard for International Development Statistics, available at http://stats.oecd.org/qwids/; (2) BR3 CTF tables.

83. The United Kingdom provides information on a large number and variety of projects and programmes supported by its substantial climate finance:

(a) Within the United Kingdom, the finance is addressed by the ICF; the Prosperity Fund, which works through the Foreign and Commonwealth Office and its networks throughout the world supporting low-carbon growth; and the Global Challenge Research Fund and the Newton Fund, which leverage the strength of the United Kingdom's research base to promote research and innovation;

(b) Multilaterally, the majority of United Kingdom contributions support the cross-cutting efforts of the GCF to support transformational projects with a strong focus on leveraging private finance. Funding for mitigation promotes technology at scale, by building capacity to raise ambition, delivering clean energy, demonstrating and deploying technology, and driving decarbonization at scale;

(c) Adaptation funding supports efforts to adapt, anticipate, and absorb impacts of climate change;

(d) Funding efforts to halt deforestation through sustainable climate resilient growth, capacity-building to improve and address sustainable land use, and private sector supply chain initiatives;

(e) Mobilizing private finance to create the conditions to enable the private sector to mobilize the investment needed and designing approaches that can be scaled by the private sector;

(f) And supporting carbon pricing to provide a cost effective and technology neutral way to reduce emissions and mobilize the private sector.

84. The United Kingdom reports that its climate finance has supported 34 million people to cope with the effects of climate change; protected 12 million people with improved access to energy, reduced or avoided 9.2 million tonnes of GHG emissions, installed more than 400 MW of clean energy capacity, and mobilized 2.2 billion and 500 million private finance for climate change.

85. The United Kingdom reported on its climate-specific public financial support, totalling USD 1,915 million in 2015 and USD 1,417 million in 2016.[5] With regard to the future financial pledges aimed at enhancing the implementation of the Convention by developing countries, the United Kingdom committed itself to providing USD 7,827 million by 2020/2021.[13] Overall, the United Kingdom's contributions between 2015 and 2016 were reduced by 26 per cent. The majority of these reductions was based on a reduction in contributions through multilateral channels, which contributions decreased by over 50 per cent in these two years, driven by a significant reduction in contribution to the GCF in 2015. The United Kingdom reports specific detail only on resources that have been provided, rather than any committed or pledged, based directly on its ICF Monitoring, Evaluation and

[5] Exchange rate in 2016: USD 1 = GBP 0.741 (source: annual exchange rates for OECD DAC donor countries).

Learning programme. During the reporting period, the United Kingdom placed a particular focus on bilateral activities conducted in Africa and South Asia, Ethiopia, and the Sahel, for which it allocated over USD 300 million, in addition to the global programmes of focus supported by the United Kingdom's contributions to multilateral channels. The ERT noted that the United Kingdom reported in CTF table 7(b) its bilateral support allocated to Annex I Parties in 2015 and 2016. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by priority is presented in table 12.

Table 12
Summary of information on channels of financial support used in 2015–2016 by the United Kingdom
(Millions of United States dollars)

Allocation channel of public financial support	*Year of disbursement*				*Share (%)*	
	2015	*2016*	*Difference*	*Change (%)*	*2015*	*2016*
Support through bilateral and multilateral channels allocated for:						
Mitigation	999.9	697.4	–302.5	–30	52	49
Adaptation	864.1	719.2	–144.9	–17	45	51
Cross-cutting	51.1	1.2	–49.9	–98	3	0
Other	0	0	0	0	0	0
Total	**1915.1**	**1417.8**	**–497.3**	**-26**	**100.0**	**100.0**
Detailed information by type of channel						
Multilateral channels						
Mitigation	486.2	196.7	-289.5	-60	64	54
Adaptation	259.9	164.6	-95.3	-37	34	46
Cross-cutting	19.4	0	-19.4	-100	3	0
Other	0	0	0	0	0	0
Total	**765.5**	**361.3**	**-404.2**	**–53**	**100.0**	**100.0**
Bilateral channels						
Mitigation	513.7	500.7	–13	–3	45	47
Adaptation	604.2	554.7	–49.5	–8	53	52
Cross-cutting	31.7	1.2	–30.5	–96	3	0.1
Other	0	0	0	0	0	0
Total	**1149.6**	**1056.6**	**–93**	**-8**	**100.0**	**100.0**
Multilateral compared with bilateral channels						
Multilateral	765.5	361.3	–404.2	–53	40	25
Bilateral	1149.6	1056.6	–93	–8	60	75
Total	**1915.1**	**1417.9**	**–497.2**	**–26**	**100.0**	**100.0**

Source: CTF tables 7, 7(a) and 7(b) of the BR3 of the United Kingdom.

Note: Values in United States dollars from table 7 of the NC7 of the United Kingdom, which indicates the exchange rate in 2015 as being USD 1 = GBP 0.655 (source: annual exchange rates for OECD DAC donor countries) and the exchange rate in 2016 as being USD 1 = GBP 0.741 (source: annual exchange rates for OECD DAC donor countries).

86. The BR3 includes detailed information on the financial support provided though multilateral, bilateral and regional channels in 2015 and 2016. More specifically, the United Kingdom contributed through multilateral channels, as reported in the BR3 and in CTF table 7(a), USD 746.09 and 361.61 million for 2015 and 2016, respectively. The contributions

were made to specialized multilateral climate change funds, such as the GCF, Climate Investment Funds–Clean Technology Fund, the Clean Investment Funds, the Least Developed Countries Fund, and the Climate Development Knowledge Network, among others.

87. The BR3 and CTF table 7(b) also include detailed information on the total financial support provided though bilateral and regional (USD 1,168.9 and 1,054.9 million) channels in 2015 and 2016, respectively. Major channels included the CDC Programme of Support in Africa and South Asia, the Productive Safety Net Programme (phase 4) in 2015, and the Building Resilience and Adaptation to Climate Extremes and Disasters programmes.

88. The BR3 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2015, the shares of the total public financial support allocated for mitigation, adaptation, and cross-cutting projects were 52, 45 and 3 per cent, respectively. In addition, 40 per cent of the total public financial support was allocated through multilateral channels and 60 per cent through bilateral, regional and other channels. In 2016, the shares of total public financial support allocated for mitigation, adaptation, cross-cutting projects were 49, 51, and less than 1 per cent, respectively. Furthermore, 25 per cent of the total public financial support was allocated through multilateral channels and 75 per cent through bilateral, regional and other channels.

89. The ERT noted that in 2015 a majority of financial contributions made through multilateral channels were allocated to the energy sector, where specified, through power generation, energy generation and supply using contributions to the Climate Investment Funds (CIF) and CIF-Clean Technology Fund, respectively. Additional resources were provided to the Climate Development and Knowledge Network, for general environmental protection. Some funds were allocated for activities that are in support of unspecified sectors, including the contributions to the GCF, which was the most significant single recipient of public financial support, as reported in CTF table 7(a). These contributions supported mitigation and adaptation, in line with the United Kingdom's intention to provide a 50/50 split between mitigation and adaptation funding.

90. The corresponding allocations for 2016 were directed mostly to cross cutting activities in adaptation and mitigation, with the majority of funding provided again to the GCF. Resources were provided to the Global Environment Facility and the Least Developed Countries Fund in 2016, in addition to the Climate Investment Funds-Clean Technology Fund. Bilateral support was provided to many activities in both 2015 and 2016, supporting a wide mix of sectors across mitigation and adaptation areas. In 2015, the largest amount of bilateral support was provided to the CDC Programme of Support in Africa and South Asia, and in 2015 the largest recipient was the Productive Safety Net Programme in Ethiopia.

91. CTF tables 7(a) and 7(b) include information on the types of financial instrument used in the provision of assistance to developing countries, which include grants, in most cases, for multilateral climate change funds and bilateral activities. Other instrument types were used in 2015, notably equity instruments for the CDC Programme.

92. In the BR3 the United Kingdom clarified that private finance is mobilized for three priority purposes: to mobilise private climate finance internationally that would not otherwise flow to countries, and seek to create a sustainable climate investment market; to mobilise private sector engagement and finance in specific sectors and technologies that experience difficulties in accessing private finance or which pose long term financial risks; and to create a better understanding of private finance internationally to inform future climate finance policy and climate projects. It reported on how it uses public funds to promote private sector financial support to developing countries, which it sees as pivotal to effectively increasing mitigation and adaptation efforts in developing countries by addressing market barriers that prevent investments from happening at scale in developing countries. The United Kingdom's contributions to the GCF support the GCF in funding transformational projects with a strong focus on leveraging private finance. In addition, the United Kingdom provides concessional or market-rate finance to help projects reach financial close and demonstrate profitability, with the aim of reducing real and perceived risks and costs of low-carbon investments. The United Kingdom also facilitates access to finance by strengthening local financial institutions and broadening types of finance available in developing country markets.

93. The United Kingdom reported on the difficulty in collecting information and reporting on private financial flows leveraged by bilateral climate finance for mitigation and adaptation activities in non-Annex I Parties, which is due to the lack of information on initiatives undertaken by the private sector. The United Kingdom notes that the majority of its funding is delivered through trusted delivery partners which leads to complex delivery chains from its ICF through to the final recipient; for this reason, they do not track who the ultimate end recipient is, including whether it is public or private.

(b) Assessment of adherence to the reporting guidelines

94. The ERT assessed the information reported in the BR3 of the United Kingdom and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Technology development and transfer

(a) Technical assessment of the reported information

95. The United Kingdom provided information on steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public and private sectors. The United Kingdom provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

96. The ERT took note of the information provided in CTF table 8 on technology development and transfer support provided globally and to Southern/East Africa and Africa. The information provided by the table describes the United Kingdom's activities to support the Clean Technology fund, where several types of low-carbon technology are supported to address mitigation, including a utility scale CSP plant that is providing power to 80,000 people in South Africa, and kick starting the market for onshore wind in Mexico. In addition, the projects on mitigation in Africa include supporting greater access to clean energy services through renewable energy project demonstration and deployment, and activities to stimulate private sector investment in low cost, clean energy technologies and services such as solar, biomass, and irrigation projects. Table 8 also provides an adaptation example in Africa, focused on increasing productivity of small holder farmers by providing increased access to agricultural technologies and a mechanism helping to address market failures in the development and adoption of technologies.

97. The ERT noted that the United Kingdom reported on its PaMs as well as success stories in relation to technology transfer, and in particular on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. For example, the Clean Technology Fund, to which the United Kingdom reports being the largest contributor, has financed the first generation of utility scale Concentrated Solar Power (CSP) to be built in developing countries, and the plant in South Africa is now providing power to 80,000 people and winning a Momentum for Change award from the UNFCCC. The United Kingdom also reports that with the IFC, they have to date supported more than 34 million people adapt to the impacts of climate change.

98. The United Kingdom provided information on steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity in order to facilitate implementation of Article 10 of the Kyoto Protocol.

99. The United Kingdom reports the priority to accelerate the deployment of low-carbon energy technologies and increase energy efficiency in order to address the global challenges of energy security, climate change and economic development. Some examples of initiatives reported include technology transfer in the areas of CCS to raise the level of technical understanding of CCUS; ADB's Clean Energy Fund, to improve energy access, energy security and the transition to low-carbon technologies through cost-effective investments; and the World Bank's Climate Technology Programme to assist local entrepreneurs develop innovative technology and business solutions to domestic energy, resource and environmental challenges. They also have launched the Climate Finance Accelerator, a

catalytic intervention designed to address the demand for turning countries' nationally determined contributions into finance plans with pipelines of investment-grade projects. The United Kingdom notes the priority to provide the evidence base for the effectiveness of its investments, and the use of its Monitoring, Evaluation and Learning programme to support the generation and use of evidence and knowledge from across the portfolio.

(b) Assessment of adherence to the reporting guidelines

100. The ERT assessed the information reported in the BR3 of the United Kingdom and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 13.

Table 13
Findings on technology development and transfer from the review of the third biennial report of the United Kingdom

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 22 Issue type: transparency Assessment: recommendation	In providing information on measures and activities related to technology transfer, and as reported in Annexed Table 8, the United Kingdom does not distinguish between activities undertaken by the public and private sectors. During the review, the United Kingdom provided information to the ERT reiterating the complexity of the delivery of ICF funding, and the tracking mechanisms that are in place to provide quality and accurate information for the BR. Due to quality control procedures in place, and the complexity of delivery, the United Kingdom cannot report specifically those activities delivered by the public versus private sector. The ERT recommends that the United Kingdom provide information that distinguishes between activities undertaken by the public and private sectors.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on BRs.

4. Capacity-building

(a) Technical assessment of the reported information

101. In the BR3 and CTF table 9 the United Kingdom supplied information on how it has provided capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties. The United Kingdom described individual measures and activities related to capacity-building support in textual and tabular format. Examples include the Climate High Level Investment Programme in Ethiopia, which built institutional capacity to ensure that the Ethiopian Government is more capable of assessing and addressing climate risks, and the Sustainable Rural Development project in Brazil, which supports farmers by providing capacity-building and technical assistance to support farmers to transition to low-carbon technologies, among other activities. The United Kingdom also reports that it is the largest donor to the Capacity Building Initiative for Transparency to date, committing GBP 10 million from ICF and 1 million from the Scottish Government.

102. The United Kingdom reported that it has supported climate-related capacity development activities relating to adaptation, mitigation, and climate financing sectors. The United Kingdom also reported that it has responded to the existing and emerging capacity-building needs of non-Annex I Parties through its extensive network of officials based in developing countries working for the Department for International Development and Foreign and Commonwealth Office, which ensures close relationships with governments and key organizations in these countries and the development of programmes based on developing country needs. They also report that they support multilateral funds and development banks, where they encourage and support that the funds are driven by country needs and in line with nationally determined comprehensive plans. The United Kingdom emphasizes that they are

committed to providing support which is transparent, transformative, and in line with the needs and priorities of developing countries. The United Kingdom reports a key priority to build capacity and capability in countries to implement their nationally determined contributions and raise ambition further, working to overcome regulatory and institutional barriers, including sharing skills and expertise where it is helpful.

103. The United Kingdom provides numerous examples of capacity-building programmes and their outcomes in table 8. These include global programmes such as CDKN, a flagship initiative aimed at providing access to high quality research and advice on climate change and development; Capacity Building for Transparency, to support implementation of transparency requirements of the Paris agreement; Global Climate Partnership Fund (GCPF) Technical Assistance, which invests through local banks to make finance available for energy efficiency and renewable energy projects; and the NDC Partnership, to help turn commitments into specific strategies and measures. Several capacity-building initiatives are also reported in Africa, Asia, and the Pacific Islands to support both mitigation and adaptation initiatives to build capacity to respond to climate related risks, design effective policy, and support development.

(b) Assessment of adherence to the reporting guidelines

104. The ERT assessed the information reported in the BR3 of the United Kingdom and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

III. Conclusions and recommendations

105. The ERT conducted a technical review of the information reported in the BR3 and CTF tables of the United Kingdom in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information is mostly adheres to the UNFCCC reporting guidelines on BRs and provides an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; progress made by the United Kingdom in achieving its target; and the Party's provision of support to developing country Parties.

106. The United Kingdom's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 39.2 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 40.9 per cent below its 1990 level in 2016. Emission decreases were driven by the energy sector – particularly from power stations (IPCC category 1A1a) due to a significant switching from coal use to other, less carbon intensive fuels and renewables.

107. Under the Convention, the United Kingdom committed to contributing to the achievement of the joint EU quantified economy-wide emission reduction target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, expressed using global warming potential values from the AR4. Emissions and removals from the LULUCF sector are not included. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms and new market mechanisms for compliance purposes up to an established limit and subject to a number of restrictions on the origin and the type of project. Companies can make use of such units to fulfil their requirements under the EU ETS.

108. Under the ESD, the United Kingdom has a target of reducing its emissions by 16.0 per cent below the 2005 level by 2020. The 2015–2020 linear progression in the United Kingdom's AEAs (its national emission target for non-ETS sectors is from 358,980.52 kt CO_2 eq in 2013 to 351,134.36 kt CO_2 eq in 2020. In addition, the United Kingdom committed itself to achieving a domestic target of a 34 per cent reduction in emissions below the 1990 level by 2020.

109. The United Kingdom's main policy framework relating to energy and climate change is the Climate Change Act (2008). Key legislation supporting the United Kingdom's climate

change goals includes the EU directives on ETS, EE, EPB, RE, LCP, but also the United Kingdom's Clean Growth Strategy (issued in 2017). The mitigation actions with the most significant mitigation impact are the new energy supply policies (about 36,170.12 kt CO_2 eq in 2020), the Building Regulations Part L, expected to deliver about 10,140.43 kt CO_2 eq in 2020 and Renewable Transport Fuel Obligation, expected to deliver about 5,817.91 kt CO_2 eq in 2020.

110. For 2015 the United Kingdom reported in CTF table 4 annual total GHG emissions excluding LULUCF of 506,765.38 kt CO_2 eq, which is 36.4 per cent below the 1990, base-year level. The United Kingdom reported that it does not intend to use units from LULUCF and market-based mechanisms to achieve its target.

111. The GHG emission projections provided by the United Kingdom in the BR3 correspond to the WEM scenario. Under this scenario, emissions are projected to be 47, per cent below the 1990 level by 2020. According to the projections under the WEM scenario, the projected level of emissions under the WEM scenario is 17.9 per cent below the AEAs for 2020. On the basis of the reported information, the ERT concludes that the United Kingdom expects to meet its 2020 target under the WEM scenario. On the basis of the reported information, the ERT concludes that the United Kingdom expects to meet its target for non-ETS sectors.

112. The ERT noted that the United Kingdom is making progress towards its emission reduction target by implementing mitigation actions that deliver significant emission reductions. On the basis of the results of the projections for 2020 under the WEM scenario, the ERT noted that the United Kingdom may achieve its emission reduction target by 2020.

113. The United Kingdom continued to provide climate financing to developing countries in line with its climate finance programmes such as ICF. It has increased its commitment to ICF from GBP 3.87 billion (equivalent to USD 5.22 billion) between 2011/2012 and 2015/2016, reported in BR2, to GBP 5.8 billion (equivalent to USD 7.83 billion) between 2016/2017 and 2020/2021 reported in BR3; and its public financial support in 2015 and 2016 totalled USD 1,915 million and 1,417 million per year, respectively. For those years, the United Kingdom's support provided for mitigation action was on par with its support provided for adaptation, and the United Kingdom has reported its intention to provide support equally between mitigation and adaptation. The biggest share of financial support went to projects in the energy sector and cross-cutting projects. The United Kingdom reported numerous bilateral projects to support technology transfer and capacity-building, helping developing countries mitigate and adapt to the impacts of climate change, reduce deforestation, and pursue clean economic growth. The United Kingdom states it is committed to providing support which is transparent, transformative, and in line with the needs and priorities of developing countries. Finally, the United Kingdom stated its priority to unlock the potential of the private sector, noting that ICF funding has mobilized GBP 500 million (equivalent to USD 675 million) in private finance to date.

114. In the course of the review, the ERT formulated recommendations for the United Kingdom to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR, namely to improve the transparency of its reporting by:[6]

(a) Providing more detailed information on changes in domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards the economy-wide emission reduction target (see issue 1 in table 4);

(b) Providing the estimated impact of the PaMs for each individual PaM and year or providing clear explanations as to why this may not be possible (see issue 2 in table 4);

(c) Providing results and explanations on the trends and drivers by sector and by gas when GHG projections are reported (see issues 1 and 2 in table 9);

(d) Clarifying how the United Kingdom has determined its financial resources as being new and additional (see issue 1 in table 10);

[6] The recommendations are given in full in the relevant chapters of this report.

(e) Elaborating on the approach for tracking the provision of technological and capacity-building support, by including information on indicators used and allocation channels tracked within the Monitoring, Evaluation and Learning programme (see issue 3 in table 10);

(f) Providing information on financial support the United Kingdom has disbursed or committed together with the methodology used, including adopting the updated CTF table 7(a) (see issue 4 in table 10);

(g) Providing information that distinguishes between activities undertaken by the public and private sectors when reporting on measures and activities related to technology transfer (see issue 1 in table 13).

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of the United Kingdom. Available at https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/submissions/national-inventory-submissions-2017.

2018 GHG inventory submission of the United Kingdom. Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018.

BR3 of the United Kingdom. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/19603845_united_kingdom-nc7-br3-1-gbr_nc7_and_br3_with_annexes_(1).pdf.

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"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories". Annex to decision 24/CP.19. Available at http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at http://unfccc.int/resource/docs/cop5/07.pdf.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 13/CP.20. Available at http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf.

NC7 of the United Kingdom. Available at http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/19603845_united_kingdom-nc7-br3-1-gbr_nc7_and_br3_with_annexes_(1).pdf.

Report on the individual review of the annual submission of the United Kingdom of Great Britain and Northern Ireland submitted in 2016. FCCC/ARR/2016/GBR. Available at https://unfccc.int/documents/65111.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of the United Kingdom of Great Britain and Northern Ireland. FCCC/IRR/2016/GBR. Available at https://unfccc.int/sites/default/files/resource/docs/2017/irr/gbr.pdf?download.

Report of the technical review of the second biennial report of the United Kingdom of Great Britain and Northern Ireland. FCCC/TRR.2/GBR. Available at https://unfccc.int/documents/9306#beg.

Report on the technical review of the sixth national communication of the United Kingdom of Great Britain and Northern Ireland. FCCC/IDR.6/GBR. Available at https://unfccc.int/documents/8659#beg.

"UNFCCC biennial reporting guidelines for developed country Parties". Annex I to decision 2/CP.17. Available at http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Alison Oliver (BEIS), including additional material. The following documents[1] were provided by the United Kingdom:

United Kingdom. 2017. *Update Energy and emissions projection.* London: Department for Business. Energy & Industrial Strategy. Available at https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2017

United Kingdom. 2018. *Spread sheet for background calculation of total effects of PaMs ("Total effects of policies and measures - NC7 Table 12.xls ”).*

[1] Reproduced as received from the Party.