



**Framework Convention on
Climate Change**

Distr.: General
13 July 2010

Original: English

**Report of the in-depth review of the fifth national
communication of the United Kingdom of Great Britain and
Northern Ireland**

Parties included in Annex I to the Convention are requested, in accordance with decision 10/CP.13, to submit a fifth national communication to the secretariat by 1 January 2010. In accordance with decision 8/CMP.3, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their fifth national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This report presents the results of the in-depth review of the fifth national communication of the United Kingdom of Great Britain and Northern Ireland conducted by an expert review team in accordance with relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. For the United Kingdom of Great Britain and Northern Ireland the Convention entered into force on 21 March 1996 and the Kyoto Protocol on 16 February 2005. Within the burden-sharing agreement of the European Union (EU) for meeting commitments under the Kyoto Protocol, the United Kingdom committed itself to reducing its greenhouse gas (GHG) emissions by 12.5 per cent compared with the base year level¹ during the first commitment period, from 2008 to 2012.

2. This report covers the in-depth review (IDR) of the fifth national communication (NC5) of the United Kingdom, coordinated by the UNFCCC secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (as contained in the annex to decision 22/CMP.1). The review took place from 1 to 6 March 2010 in London, United Kingdom, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. François Dejean (EU), Ms. Balgis Elasha (Sudan), Mr. Marius Țăranu (Republic of Moldova) and Ms. Courtney Upshall (United States of America). Mr. Dejean and Mr. Țăranu were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene and Mr. Harald Diaz-Bone (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each part of the NC5. The ERT also evaluated the supplementary information provided by the United Kingdom under Article 7, paragraph 2, of the Kyoto Protocol provided by the United Kingdom in conjunction with the NC5. Also, the ERT reviewed supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by the Party in its 2009 annual submission and elaborated further in its 2010 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

4. In accordance with decision 22/CMP.1, a draft version of this report was communicated to the Government of the United Kingdom, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The United Kingdom's NC5 complies broadly with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1 most of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol² was provided in the NC5.

6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3 above is complete, transparent and was provided on time. During the review the United Kingdom provided further relevant information.

¹ "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. The base year emissions include emissions from sectors/categories listed in Annex A to the Kyoto Protocol.

² Decision 15/CMP.1, annex, chapter II.

1. Completeness

7. The NC5 covers all the sections and contains information that meets most of the mandatory reporting requirements of the UNFCCC reporting guidelines. In its NC5, the United Kingdom provided or referenced most of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol, except for the description of the national registry. The NC5 does not provide information on why this mandatory element is not reported. In response to a question raised by the ERT during the review, the United Kingdom explained the reasons for the omission and provided the required information on its national registry. The ERT recommends that the United Kingdom further enhance quality assurance of the reporting and include all mandatory reporting elements in its next national communication.

8. In addition, the ERT noted that some mandatory reporting elements were not included in the NC5, including an estimate for the total effect of adopted and implemented policies and measures (PaMs), emission projections related to fuel sold to ships engaged in international transport and information on steps taken to promote or implement any decisions by the International Maritime Organization (IMO) in order to limit or reduce GHG emissions from marine bunker fuels. The executive summary of the NC5 contains limited or no information on: the national circumstances relevant to GHG emissions and removals; GHG inventory; information on the national system and the national registry; vulnerability and adaptation; research and systemic observations; and education and training. The ERT recommends that this information be included in the next national communication.

9. The ERT encourages the United Kingdom to improve completeness of the reporting by elaborated information on national circumstances (see paras. 15, 16), including ‘without measures’ and ‘with additional measures’ projections (see para. 86), impacts of climate change on human health (see para. 108); financial resources (see para. 116), research and systematic observations (see para. 128) and training and public awareness (see para. 129).

2. Transparency

10. The ERT acknowledged that the United Kingdom’s NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, is well structured and concise. The NC5 provides information on most of the aspects of implementation of the Convention and its Kyoto Protocol. It broadly follows the outline contained in the annex to the UNFCCC reporting guidelines and supplementary information submitted under Article 7, paragraph 2, of the Kyoto Protocol is easily identifiable.

11. In the course of the review, the ERT formulated a number of recommendations that could help the United Kingdom to further increase the transparency of its reporting, including the provision of more sector-specific information on factors and activities underpinning emission trends between 1990 and 2020 (see paras. 15 and 90) and specific information on PaMs (see para. 29).

12. The ERT encourages the United Kingdom to further improve transparency and consistency of reporting by organizing the reporting according to the sectors defined in the UNFCCC reporting guidelines (see para. 28), applying consistent classification of PaMs in chapters for PaMs and projections, ensuring that the ‘with measures’ scenario definition corresponds with that of the UNFCCC reporting guidelines (see paras. 83 and 86); further specifying the presentation of emissions projections (see paras. 84 and 85), and providing further information on adaptation (see para. 108) and technology transfer (see para. 120).

3. Timeliness

13. The NC5 was submitted on 5 June 2009, before the deadline of 1 January 2010 mandated by decision 10/CP.13.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures

14. In its NC5, the United Kingdom has provided a concise description of the national circumstances, the framework legislations and key policy documents on climate change. The NC5 also referred to the description of a national system provided in the national inventory report (NIR) of the 2009 annual submission. Further technical assessment of the institutional and legislative arrangements for coordination and implementation of PaMs are provided in chapter II.B.I of this report.

1. National circumstances

15. In its NC5, the United Kingdom has provided a description of its national circumstances, and information on how these national circumstances affect GHG emissions and removals in the United Kingdom and how changes in national circumstances affect GHG emissions and removals over time. The ERT noted that the main drivers of emission trends in the United Kingdom include: restructuring, especially in the energy supply industry; energy efficiency measures; pollution control measures in the industrial sector; and other policies that reduced emissions of non - carbon dioxide (CO₂) GHG gases, most notably the increase in landfill methane (CH₄) capture and oxidation. The ERT also noted that more detailed information on geographical and economic profiles would be useful as well as on sector-specific parameters (such as gross domestic product (GDP)), energy supply and demand, industrial outputs, crop land areas, fertilizers consumption, livestock numbers, etc.). Table 1 illustrates some of the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

Table 1

Indicators relevant to greenhouse gas emissions and removals for the United Kingdom

	1990	1995	2000	2005	2008	Change 1990– 2000 (%)	Change 2000– 2008 (%)	Change 1990– 2008 (%)
Population (million)	57.24	58.03	58.89	60.22	61.06	2.9	3.7	6.7
GDP (2000 USD billion using PPP)	1194.02	1295.16	1533.45	1729.71	1844.90	28.4	20.3	54.5
TPES (Mtoe)	207.17	217.10	223.99	222.75	207.42	8.1	-7.4	0.1
GDP per capita (2000 USD thousand using PPP)	20.86	22.32	26.04	28.72	30.21	9.9	16.0	44.8
TPES per capita (toe)	3.62	3.74	3.80	3.70	3.40	5.1	-10.7	-6.1

	1990	1995	2000	2005	2008	Change 1990– 2008 (%)	Change 2000– 2008 (%)	Change 1990– 2008 (%)
GHG emissions without LULUCF (Tg CO ₂ eq)	774.68	715.28	675.98	658.09	631.73	-12.7	-6.5	-18.5
GHG emissions with LULUCF (Tg CO ₂ eq)	777.63	716.55	675.67	656.17	629.79	-13.1	-6.8	-19.0
CO ₂ emissions per capita (Mg)	10.33	9.53	9.39	9.26	8.79	-9.1	-6.4	-14.9
CO ₂ emissions per GDP unit (kg per 2000 USD using PPP)	0.50	0.43	0.36	0.33	0.29	-28.0	-19.2	-41.8
GHG emissions per capita (Mg CO ₂ eq)	13.53	12.33	11.48	10.93	10.35	-15.2	-9.9	-23.6
GHG emissions per GDP unit (kg CO ₂ eq per 2000 USD using PPP)	0.66	0.56	0.45	0.40	1.36	-31.8	202.2	106.1

Data sources: (1) GHG emissions data: United Kingdom's 2010 greenhouse gas inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

16. The United Kingdom has provided in its NC5 a summary of information on GHG emission trends for the period 1990–2007. This information is consistent with the 2009 national GHG inventory submission. The ERT noted that in its NC5 United Kingdom reports the CO₂ equivalent (CO₂ eq) emissions with LULUCF but not without LULUCF, whereas information on CO₂ eq emissions without LULUCF is available in the NIR of its 2009 annual submission in the form of common reporting format (CRF) tables. The ERT recommends that the United Kingdom include this information in its next national communication following the CRF contained in the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories”. During the in-country visit the United Kingdom provided data from its 2010 annual submission, which is referred to in table 1 and further in the report.

17. Total GHG emissions excluding emissions and removals from LULUCF decreased by 18.5 per cent between 1990 and 2008, whereas total GHG emissions including net emissions and removals from LULUCF decreased by 19.0 per cent. This decrease was mainly due to a decrease in CH₄ emissions of 53.2 per cent over this period and was the largest reduction in emissions (55.7 Tg CO₂ eq). Emissions of CO₂ decreased by 9.2 per cent (54.4 Tg CO₂ eq), while emissions of nitrous oxide (N₂O) decreased by 47.9 per cent (31.2 Tg CO₂ eq). Emissions of fluorinated gases (hydrofluorocarbons

(HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) taken together) decreased by 11.9 per cent and they accounted for 1.8 per cent of total GHG emissions in 2008 (1.9 per cent in 1990). The LULUCF sector, which was a minor source of emissions in 1990, has become a sink since 1999. Table 2 provides an overview of GHG emissions by sector from 1990 to 2008 (see also discussion of sectoral trends in chapter II B).

Table 2

Greenhouse gas emissions by sector in the United Kingdom, 1990–2008

Sector	GHG emissions (Tg CO ₂ eq)					Change (%)		Shares ^a by sector (%)	
	1990	1995	2000	2005	2008	1990–2008	2007–2008	1990	2008
1. Energy	612.1	568.5	560.5	559.7	536.3	–12.4	–1.9	79.0	84.9
A1. Energy industries	239.4	205.1	199.4	213.6	207.7	–13.2	–2.7	30.9	32.9
A2. Manufacturing industries and construction	100.9	94.0	93.6	84.4	76.9	–23.8	–4.7	13.0	12.2
A3. Transport	119.2	120.6	125.9	131.5	129.4	8.6	–3.1	15.4	20.5
A4.–A5. Other	117.3	117.7	120.9	114.5	109.6	–6.6	3.6	15.1	17.3
B. Fugitive emissions	35.3	31.0	20.7	15.8	12.7	–64.1	–5.3	4.6	2.0
2. Industrial processes	54.0	46.4	30.9	28.7	28.8	–46.6	–2.4	7.0	4.6
3. Solvent and other product use	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NA	NA
4. Agriculture	55.6	53.4	50.4	46.7	43.8	–21.2	–1.1	7.2	6.9
5. LULUCF	3.0	1.3	–0.3	–1.9	–1.9	–165.7	4.9	0.4	–0.3
6. Waste	52.9	47.1	34.2	23.0	22.8	–56.9	–0.5	6.8	3.6
7. Other	0.0	0.0	0.0	0.0	0.0	42.8	0.0	0.0	0.0
GHG total with LULUCF	777.6	716.6	675.7	656.2	629.8	–19.0	–1.9	NA	NA
GHG total without LULUCF	774.7	715.3	676.0	658.1	631.7	–18.5	–1.9	100.0	100.0

Abbreviations: GHG = greenhouse gas, IE = included elsewhere, LULUCF = land use, land-use change and forestry, NA= not applicable, NE = not estimated.

Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

^a The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

18. Between 1990 and 2008 GHG emissions decreased in all sectors. The largest decrease was observed in the energy sector, driven mainly by enhanced efficiency and structural changes that were a result of fuel switching from coal to gas, increasing use of

renewable energy sources and combined heat and power, as well as the improved performance of nuclear power plants. Altogether this resulted in a decrease in carbon intensity of the economy. Within the energy sector, GHG emissions decreased in all subsectors except transport, for which the ERT noted a continuous growth of emissions in the period 1990–2007. This growth in emissions was driven by increasing transport demand, which was partly offset by improvements in new car fuel efficiency.

2. National system

19. In accordance with decision 15/CMP.1, the United Kingdom provided in its NC5 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1 (decision 19/CMP.1). The Party also provided a reference to its 2009 annual submission, which contains all the elements set out in decision 15/CMP.1.

20. During the review the United Kingdom provided an overview of the national system and elaborated on institutional and legislative arrangements and administrative procedures for GHG inventory planning, preparation and management (e.g. on the GHG inventory cycle, inventory improvement programme and quality assurance/quality control programme and plan).

21. The ERT took note of the recommendations of the report of the individual review of the 2009 GHG inventory of the United Kingdom³ (2009 annual review report (ARR)) and noted that the United Kingdom has started work on the formalization of data provision. During the review the ERT learned that the formalization of informal agreements with data providers into a memorandum of understanding is progressing and that data for the 2010 annual submission were provided on the basis of informal agreements. The ERT reiterates the recommendation of the 2009 ARR that the Party formalize the data provision in order to ensure the continuity of the inventory preparation process. The ERT agrees with the conclusion of the 2009 ARR that the national system continues to perform its required functions as set out in decision 19/CMP.1

3. National registry

22. In its NC5 the United Kingdom has not provided either a description or a reference to a description of how its national registry performs the functions and how it complies with the requirements of the technical standards for data exchange between registry systems as adopted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) (decision 13/CMP.1). Although the 2009 annual submission contains full information on the national registry, the cross references to the NIR in annex E to the NC5 were made only to the other reporting elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol.

23. In response to the question raised by the ERT during the review, the United Kingdom explained that the table in annex E to the NC5 followed the format used for the fourth national communication (NC4), where the section on the national registry was not included, as the registry was not required and therefore not available at that time. The ERT acknowledges that the United Kingdom submitted its NC5 fairly early and did not benefit from the updated UNFCCC advice on the structure of NC5s. The United Kingdom, however, acknowledged that such an omission could have been avoided by better quality assurance. Also during the review the Party provided documents demonstrating how it records the changes relating to the national registry and how it maintains these records. The ERT noted that updates of databases and applications, implemented security measures

³ FCCC/ARR/2009/GBR. Available at <<http://unfccc.int/resource/docs/2010/arr/gbr.pdf>>.

and changes to the national registry software are documented on a regular basis by nominated responsible staff.

24. The ERT took note of the recommendations of the 2009 ARR that the United Kingdom take appropriate action to reduce the number of out-of-sequence messages sent by its registry and enhance the user interface of its registry by providing the public information referred to in paragraphs 45, 46 and 48 of the annex to decision 13/CMP.1, and report in its next annual submission on any changes made to that public information. During the review the ERT learned that the United Kingdom had addressed this recommendation and made efforts to report on changes made to the public information.

25. The ERT also took note of the conclusion of the standard independent assessment report (SIAR) that the United Kingdom continues to maintain sufficient capacity to ensure the accurate accounting of the Kyoto Protocol units and that it continues to conform to the technical standards for data exchange between registry systems.

26. The ERT concluded that the United Kingdom's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

27. As required by the UNFCCC reporting guidelines, the United Kingdom has provided in its NC5 comprehensive, well-organized information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. The United Kingdom has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention; domestic targets play an important role in climate change policymaking. Table 3 provides a summary of the reported information on the PaMs of the United Kingdom.

Table 3

Summary of information on policies and measures

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Framework policies and cross-sectoral measures</i>	
Legislative framework	Climate Change Act (2008) Low Carbon Transition Plan (2009)
Emissions trading	EU ETS (49.6 Mt CO ₂ eq per year) CRC Energy Efficiency Scheme (at least 4Mt CO ₂ per year by 2020)
Energy taxation	Climate Change Levy Climate Change Agreements
Research and development	Environmental Transformation Fund Marine Renewables Deployment Fund Carbon capture and storage demonstration projects
<i>Policies and measures by sector</i>	
<i>Energy</i>	
Renewable Energy Sources	The UK Renewable Energy Strategy (2009) Renewables Obligation Feed-in-tariff Renewable Heat Incentive (8.5 Mt CO ₂ eq per year)
Energy efficiency improvements	Carbon Emissions Reduction Targets replaces Energy Efficiency Energy efficiency loan schemes for small and medium size enterprises Smart meters (1.3 Mt CO ₂ eq/y) Warm Front Scheme to address fuel poverty (0.7 Mt CO ₂ eq/y) Code for Sustainable Homes Building regulations (domestic, commercial, industry) (8.6 Mt CO ₂ eq/y in EU performance of buildings directive)
Other	Warm Homes, Greener Homes: a Strategy for Household Energy
<i>Transport</i>	
Vehicle and fuel taxes	Renewable Transport Fuel Obligation 5 per cent per volume (5.0 Mt CO ₂ Extension of biofuels to 10 per cent (by energy) (6.0 Mt CO ₂ eq per year) Vehicle Excise Duty Company car tax
Improved fuel efficiency	EU new car average fuel efficiency standards (7.7 Mt CO ₂ eq per year) Low-carbon buses, draft regulation on van CO ₂ emission standards Grants and rebates for electric vehicles and plug-in hybrid vehicles
Behavioral change	Campaigns on climate change: 'ACT ON CO ₂ ', Sustainable Travel Towns Low-carbon transport: a greener future
<i>Industrial processes</i>	
	Integrated pollution prevention and control directive EU regulation on fluorinated gases ^a

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Agriculture</i>	<p>Common Agriculture Policy</p> <p>Health check agreement</p> <p>Soil Protection Review</p> <p>Environmental Stewardship</p> <p>Rural Development Programme for England</p> <p>Nitrates Action Programme</p> <p>Bioenergy Capital Grants Scheme; Energy Crops Scheme</p> <p>Knowledge and advice efforts (Farming Futures Partnership)</p> <p>Anaerobic Digestion Demonstration Programme</p> <p>Defra research programme on agriculture and climate change</p>
<i>Forestry</i>	<p>Forestry Act</p> <p>Forestry Standard;</p> <p>Woodland Grant Schemes</p> <p>Code of Good Practice for Forest Carbon Projects</p> <p>Woodfuel Strategy for England</p>
<i>Waste management</i>	<p>EU Landfill Directive</p> <p>Landfill tax</p> <p>Waste Strategy 2007</p>

Note: The greenhouse gas reduction estimates given for some measures (in parentheses) are annual reductions in CO₂ or CO₂ eq expected to be achieved by 2020 as reported in the UK Low Carbon Transition Plan. The measures, other than the European Union emissions trading scheme, are those taken in the non-traded sector only.

^a Regulation (EC) No 842/2006 of the European Parliament and of the Council, the format for the report to be submitted by producers, importers and exporters of certain fluorinated greenhouse gases.

28. However, the ERT noted that the United Kingdom did not organize the reporting of PaMs according to the following sectors: energy, transport, industry, agriculture, forestry, and waste management, as required by the UNFCCC reporting guidelines. This has, to some degree, decreased the comparability of the chapter on PaMs with the rest of the NC5. In the NC5 national economic classification of sectors was used, without explanation of how this classification matches that required by the UNFCCC reporting guidelines. During the review the United Kingdom explained that the business sector, identified as a separate sector, covers the industry and service sectors. The ERT encourages the United Kingdom use the sectors classification of the UNFCCC reporting guidelines, to the extent possible.

29. The ERT noted some inconsistencies and omissions in the description of PaMs. The NC5 contains textual descriptions of the principal PaMs by sector, supplemented by summary tables on PaMs by sector, included in annex B to the NC5. The ERT noted some inconsistencies between the textual description of the PaMs and the summary table in annex B (not all PaMs included in annex B were described in chapter 3), including inconsistencies in the names and quantified effects of some PaMs. Furthermore, the descriptions of a number of PaMs in the summary table are incomplete and estimates of the effects are missing. The ERT encourages the United Kingdom to improve the consistency and completeness of reporting in its next national communication.

30. The NC5 contains a similar, but expanded, set of PaMs to those in the NC4; for example, the NC5 includes a description of PaMs in the waste management sector which was missing in the NC4. However, the ERT noted that, in respect to aviation and marine bunker fuels, the United Kingdom did not, pursuant to Article 2, paragraph 2, of the Kyoto Protocol, identify the steps it has taken to promote and/or implement any decisions by IMO in order to limit or reduce emissions of GHGs not controlled by the Montreal Protocol from marine bunker fuels. During the review, the United Kingdom explained that international aviation, which covers all arriving and departing flights from EU airports, will be included in the EU emissions trading scheme (EU ETS) from 2012 onwards. The ERT recommends that the United Kingdom include information on marine and aviation bunker fuels in its next national communication.

31. The Party provided comprehensive information on PaMs at national and subnational/regional levels. The impact of the various PaMs are aggregated, to some degree, at the sectoral level and the synergies and overlap among the PaMs at national and subnational/regional levels were well explained.

32. The ERT noted that information on costs associated with some PaMs is provided for only a few PaMs (e.g. GBP 400 million investment in the United Kingdom Environmental Transformation Fund to develop low-carbon energy and energy efficiency technologies). The ERT encourages the United Kingdom to report the total implementation and abatement costs of its PaMs in tabular format in its next national communication.

33. The ERT noted that a number of PaMs are innovative and replicable. For example, in the business sector, the United Kingdom plans to facilitate abatement of GHGs through the Carbon Reduction Commitment (CRC) (an energy-use trading scheme with a table that ranks energy users according to their performance) and Climate Change Agreements (CCAs) (a set of negotiated agreements with the industry promoting energy savings in return for a discount on payment of the Climate Change Levy (CCL)). For the residential sector the Carbon Emissions Reduction Target (CERT) obligates energy companies to achieve a carbon score by delivering energy efficiency measures to households. Application of CERT, CCAs and CRC require the collection of good-quality data (monitoring, reporting, verification and ex ante information to set caps and targets) therefore replication of these PaMs in other countries depends to a large extent on conditions in other countries. In addition, the ERT noted that setting periodic carbon budgets could be considered as an innovative and replicable approach to demonstrating progress towards the emission reduction targets.

34. The United Kingdom has not reported on PaMs that potentially increase emissions; it indicated that its emissions trading scheme (UK ETS), which was featured in its NC4, is no longer in place. As explained by the United Kingdom it was discontinued in December 2006 because large energy intensive installations that were previously covered by the UK ETS are now covered by the EU ETS. The emissions from the large non-energy intensive commercial and public sectors will be tackled by the CRC from 2010.

1. Policy framework and cross-sectoral measures

35. The Department of Energy and Climate Change (DECC) coordinates United Kingdom policy on climate change mitigation at official level through inter-departmental committees chaired by DECC. A Cabinet Committee makes decisions at ministerial level. Some policies are under the direct responsibility of DECC while others are under the responsibility of Her Majesty's Treasury, the Department for Transport (DfT), the Department for Environment, Food and Rural Affairs (Defra), the Department of Communities and Local Government, the Department for Business, Innovation and Skills, the Foreign and Commonwealth Office, the Forestry Commission and the Department for International Development (DFID). The implementation of United Kingdom Government's

programme on climate change is supported by action taken by the Devolved Administrations in Scotland, Wales and Northern Ireland.

36. The NC5 states that the United Kingdom Climate Change Act (2008) is the world's first long-term, legally binding national framework to reduce GHG emissions. The Climate Change Act establishes a legally binding target to reduce the United Kingdom's net GHG emissions by at least 80 per cent below 1990 levels by 2050 and defines the emission reduction pathway to the 2050 target by limiting the total amount of GHG emissions permitted in the United Kingdom in each consecutive five-year period, beginning in 2008. The five-year carbon budgets are specified in the national strategy for climate and energy – the UK Low Carbon Transition Plan (LCTP) – which became the UK's key strategy for climate policy. The LCTP set out a route map accompanied by a number of policies and measures for transition to a low-carbon economy

37. The LCTP aims to deliver emission cuts of 18 per cent below 2008 levels by 2020 (equivalent to 34 per cent below 1990 levels) and set out the policies and proposals to meet the three five-year carbon budgets for the periods 2008–2012, 2013–2017 and 2018–2022. The 2008–2012 carbon budget corresponds to a 22 per cent reduction of net emissions below 1990 levels, while the 2018–2022 carbon budget corresponds to emission reductions of at least 34 per cent by 2020 below 1990 levels. The Government set the level of the carbon budgets in line with the recommendations of the Committee on Climate Change, an independent body established by the Climate Change Act to provide to advise the Government on setting carbon budgets. The 2018–2022 carbon budget also stems from the conclusions of the Government's assessment regarding the reductions required to meet the United Kingdom's share of the 2008 EU Climate and Energy package on United Kingdom emissions and is therefore consistent with obligations to meet the EU target objective to reduce emissions by at least 20 per cent below 1990 by 2020.

38. Under the LCTP, all major United Kingdom Government departments have been allocated their own carbon budget and are required to produce their own plans to adhere to these budgets and meet emission reduction goals. The ERT noted that this mainstreaming approach is essential for the successful implementation of the LCTP and that there are a number of potential barriers to reaching these goals, including those relating to funding, existing infrastructure, technology, capacity and workforce.

39. The United Kingdom expects to meet its 2050 emission reduction target (80 per cent by 2050) by a combination of reductions in energy-related CO₂ emissions and reductions in non-CO₂ emissions, as well as by using international emissions trading as reflected in the most recent projections (see para. 79 below).

40. The United Kingdom also provided the ERT with a number of sectoral strategies that have been developed to outline how the carbon budgets will be met. The UK Renewable Energy Strategy 2009 sets out the path for meeting its legally binding target agreed at EU level (15 per cent of its energy to come from renewable sources by 2020), and ensures that it can deliver the objectives set out in the LCTP target (40 per cent of the United Kingdom's electricity to come from low-carbon sources by 2020, with 30 per cent of electricity through renewable energy in 2020). "Low Carbon Transport: A Greener Future" is a carbon reduction strategy prepared by DfT to enable the transportation sector to contribute about 19 per cent of emission savings under the LCTP in the period 2018–2022. "Warm Homes, Greener Homes" presents the United Kingdom's household energy management strategy for reaching the LCTP's goal of cutting emissions from fossil fuels in homes by 29 per cent by 2020.

41. The ERT noted that PaMs complement each other to cover all sectors and that a number of climate change policies and instruments, including the EU ETS, the Climate Change Levy, the CCA, the CRC and the Carbon Trust, have cross-sectoral effects. The

PaMs driving most emission reductions are the EU ETS, energy efficiency measures, and policies supporting use of renewable energy for heat and transport. According to the LCTP the EU ETS will deliver 54.0 per cent (248 Mt CO₂ eq) of emissions savings in 2018–2022. In the United Kingdom the EU ETS covers approximately 900–950 installations, which are responsible for approximately 42 per cent of the United Kingdom’s GHG emissions in the second phase of the EU ETS (2008–2012). The first phase of the EU ETS (2005–2007) resulted in an 8 per cent reduction of United Kingdom’s 2005 GHG emissions compared with the ‘business as usual’ scenario and it is expected that the second phase of the EU ETS will further reduce GHG emissions by 13 per cent, taking into account changes in scope.

42. The Devolved Administrations Scotland, Wales and Northern Ireland develop and implement complementary PaMs. Through the Climate Change (Scotland) Act 2009, the Scottish Government has committed to reduce its GHG emissions by at least 42 per cent by 2020 and at least 80 per cent by 2050 compared with the 1990 international baseline. Scotland’s Climate Change Delivery Plan (2009) sets out the high-level measures required in each sector to meet Scotland’s statutory climate change targets and will be followed by a more detailed report on proposals and policies in 2010. Scotland also launched its Climate Change Adaptation Framework in 2009. The Northern Ireland Executive has consented to the United Kingdom Climate Change Act (2008) and has set a target in its Programme for Government to reduce emissions by 25 per cent below 1990 levels by 2025. The Welsh Assembly Government published its Climate Change Strategy in 2009 and has committed to achieving annual GHG emission reductions of 3 per cent per year by 2011.

43. Regional development agencies provide regional leadership to businesses, local authorities and other organizations on energy and climate change. Regional strategies are being developed to deliver regional renewable energy targets in line with the UK Renewable Energy Strategy. Loans and best practice funding is available to local authorities. There are two local government performance indicators associated with reduction in CO₂ emissions: NI 185 (reduction in CO₂ emissions from local authority operations) and NI 186 (per capita reduction in CO₂ emissions from local authority areas). The ERT noted that setting reduction targets on both performance indicators is voluntary. Making target setting for one (or both) mandatory might be an opportunity for significantly reducing CO₂ emissions in this sector. The ERT recognizes the need for effective diffusion and delivery of centralized government initiatives at local authority level through the introduction of attractive incentives and effective and targeted communication, in particular to meet very ambitious renewable heat targets. The ERT encourages the United Kingdom to further report on action undertaken in this domain.

2. Policies and measures in the energy sector

44. The energy sector is the United Kingdom’s largest contributor to GHG emissions, responsible for 84.9 per cent of emissions in 2008, compared with 79.0 per cent in 1990. Between 1990 and 2008, energy-related emissions decreased by 12.4 per cent. This decrease results from a 13.2 per cent decrease in energy industries, a 23.8 per cent decrease in the manufacturing industries and construction sector (driven by fuel switching and a decline in energy intensity arising from structural change and policy actions) and an 8.6 per cent increase in the transportation sector (driven by increasing demand, which was only partly offset by improvements in new car fuel efficiency).

45. The United Kingdom has presented a comprehensive set of PaMs aimed at reducing GHG emissions in energy supply and energy use in the residential, commercial and transport sectors. Further information on new PaMs was made available to the ERT during the review.

46. **Energy supply.** Most PaMs focused on the increased use of renewable energy sources and low-carbon energy sources. The United Kingdom plans to reach by 2020 the

LCTP goal of 40 per cent of the country's electricity (and by 2050 virtually all its electricity) coming from renewable sources, nuclear power or fossil fuels where carbon dioxide emissions are captured and stored (carbon dioxide capture and storage (CCS)).

47. **Renewable energy sources** will play the largest part in meeting this goal for 2020. The 2009 EU renewable energy directive⁴ requires 15 per cent of the United Kingdom's final energy consumption to come from renewable energy sources by 2020; the UK Renewable Energy Strategy, which sets out how the United Kingdom will increase the use of renewable energy sources for heating, electricity and transport to meet the target affects the total generation and generation mix. In 2008, renewable energy sources accounted for approximately 2.5 per cent of consumption. The ERT noted that achieving a seven-fold increase in the share of renewable energy in a decade requires overcoming major financial, current market challenges including deployment (supply chain, planning/regulation, achievability) and resource constraints. It also involves uncertainties, including a forecast for a 6 per cent increase in household energy bills by 2020, energy security (e.g. security for wind supply) and local environmental pressures. The United Kingdom has committed GBP 100 billion to ensure the increase necessary to reach these targets and put in place several policy instruments.

48. The **Renewables Obligation (RO)**, launched in 2002, requires electricity suppliers to source a specific percentage of the electricity they supply from renewable energy sources and provide financial incentives for electricity generation from renewable energy sources. The obligation in England and Wales for 2009–2010 is 0.097 Renewables Obligation Certificates (ROCs) per MWh of electricity supplied (approximately 10 per cent renewable electricity) and will rise to 0.111 ROCs per MWh for 2010–2011 (approximately 11 per cent renewable electricity). To encourage the adoption of emerging technologies, the RO has been designed so that different technologies receive different levels of support depending on their cost. The cost of CO₂ currently saved under the RO is GBP 101 per tonne. To supplement the RO a feed-in tariff (FIT) system is scheduled to be introduced in April 2010 to support small electricity generation (up to 5 MW) from renewable energy sources.

49. Another instrument is the **Renewable Heat Incentive (RHI)**, which is scheduled to come into effect in 2011. Similar in design to the FIT, the RHI has been developed to encourage the adoption of renewable heat technologies by providing a tariff based on the amount of heat produced. The RHI is expected to deliver annual carbon savings of 3.6 Mt CO₂ per year outside EU ETS across all sectors. The United Kingdom is also investing in wave and tidal energy technology demonstration.

50. **Nuclear power** is another important electricity source identified in the LCTP. However, the first new plant is not planned to be in operation until 2018. The ERT noted that, although the newly formed Infrastructure Planning Commission is designed to streamline the process, the Government has identified 10 sites as potentially suitable for construction. In addition, the Government has made a commitment to take title to nuclear waste in return for a fee. Private funding for the construction of the plants is not yet secured (see para. 100).

51. **Carbon storage and sequestration** is another key element of long-term energy supply strategy. The United Kingdom has committed to support four commercial-scale demonstration projects to develop CCS technology. In 2009 a GBP 15 million call for applied research and development and pilot-scale projects through the Technology Strategy Board was launched. The ERT noted that CCS technology is still at the developmental/demonstration stages. Further challenges for the development of this

⁴ Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources.

technology include obtaining private-sector investment, successful technology development, development of a regulatory framework, and availability and security of storage.

52. **Microgeneration** is another important element in the LCTP. The Green Energy Act 2009 requires the Government to consult on a new microgeneration strategy by mid-July 2010. The microgeneration strategy will focus on non-financial barriers to the take-up of microgeneration technologies. It will address challenges, including increasing installer capacity, enhancing certification (Microgeneration Certification Scheme), and building consumer demand and easier connections.

53. **Residential and commercial sectors.** Energy use in the residential sector accounts for 23 per cent of the United Kingdom's GHG emissions in both the traded and the non-traded sectors. The target in the LCTP calls for a 29 per cent reduction in the non-traded sector by 2020 below 2008 levels (equivalent to a 34 per cent reduction below 1990 levels). During the review the Party informed the ERT that the residential sector was more energy efficient by 15.5 per in 2008 than in 2000.

54. In the residential sector energy efficiency is incentivized by a number of measures and instruments, including regulations (such as building regulations, CERT, smart meter roll-out), standards (such as the Code for Sustainable Homes) and incentive or support programmes (such as the Warm Front and fuel poverty programmes). There is a policy commitment for all new homes to be built to a zero carbon standard from 2016. In the commercial and public sectors building regulations, climate change levy, CRC and funding programmes (such as Salix Finance and the Low Carbon Technology Programme) provide the key incentives for energy efficiency improvements.

55. **CERT**, which replaced the Energy Efficiency Commitment (EEC), is the primary policy driving efficiency efforts in existing homes through energy supplier obligation. According to the supplier obligation a supplier can meet its obligations to supply energy by installing a range of approved measures (e.g. insulation, boilers, microgeneration). Obligation under CERT was increased by 20 per cent between April 2008 and March 2011 and is planned to be extended to 2012. According to the LCTP, CERT and energy supplier obligation will provide an average annual reduction of 9.16 Mt CO₂ over the period of 2018–2020. The ERT noted that through CERT, supplier investment in energy efficiency upgrades will total about GBP 5.6 billion, providing CERT is extended to the end of 2012. The **smart meter roll-out** Government initiative includes an obligation for energy companies to supply and install smart meters in all households by 2020, with the roll-out beginning in 2012. This initiative is expected to deliver annual carbon savings of 0.36 Mt CO₂ during the period 2018–2020.

56. **The Code for Sustainable Homes**, the national voluntary standard for the design and construction of new homes, became operational in 2007. It covers standards for energy, water and waste management.

57. **Warm Front and fuel poverty programmes** provide vulnerable households with energy-efficient heating and insulation measures through installation measures. This measure expects to deliver 1.88 Mt CO₂ annual emission reductions in 2018–2022. Another scheme that provides fiscal incentives to households is the “Pay As You Save” scheme, which is currently being piloted. It is a financing mechanism that allows home owners to take out ‘green loans’ to insulate homes with no upfront costs. “Clean energy cash back” schemes such as the RHI and FIT help facilitate homeowner renewable energy investments.

58. **Building Regulations** for non-domestic buildings were amended in 2006 to further raise efficiency standards and are expected to deliver additional emission reductions of 6.92 Mt CO₂ per year by 2020. In addition, in 2008 the United Kingdom completed

implementation of the EU energy performance of buildings directive, which requires inspection of large boilers and air conditioning systems, among other things. The ERT noted, however, that there is no follow-up in place to determine whether improvements were made based on the recommendations of inspections.

59. For the public commercial sector, **the climate change levy (CCL)** continues to be a central policy on energy efficiency and has increased in line with inflation since 2007. CCAs incentivize energy-intensive industries to improve energy efficiency by providing an 80 per cent discount from CCL in return for meeting demanding energy efficiency targets. This discount will be reduced to 65 per cent in April 2011. CCAs are expected to achieve annual savings from targets of around 11 Mt CO₂ carbon by 2010 compared with 'business as usual'. The ERT noted, however, that estimated emission reductions were not reported for this policy in the NC5, even though reductions were reported in the NC4. It encourages the United Kingdom to include these estimates in its next national communication.

60. Another key policy aimed at emission reduction from the commercial and public sectors is the **CRC**, which is a new mandatory emissions trading scheme. As of 2010, this policy complements existing policy by covering emissions outside CCAs and direct emissions outside the EU ETS. It is estimated to reduce emissions by at least 4 Mt CO₂ per year by 2020.

61. In the public and business sectors, energy efficiency improvements are incentivised through a number of programmes and funds, such as the Salix Finance and Low Carbon Technology Programme (LCTech), energy efficiency loan schemes and the Carbon Trust. For example, the Carbon Trust runs the Government's Enhanced Capital Allowance scheme, which provides businesses that invest in energy-efficient equipment with enhanced tax relief.

62. The ERT recognizes the complexity of coordinating efforts to reach targets in the public sector and encourages the United Kingdom to consider developing a clear strategy/guidance among central government, regional offices and local government.

63. **Transport sector.** The transport sector accounted for 20.5 per cent of total GHG emissions in 2008 and is the only sector where emissions grew substantially, by 8.6 per cent between 1990 and 2008. The LCTP calls for a 14 per cent reduction in emissions by 2020 below their 2008 level that is to be achieved through a variety of PaMs. PaMs in this sector aim at increasing the share of renewable energy sources, improving the energy-efficiency of vehicles and encouraging behaviour changes. The ERT noted that in the strategy document "Low Carbon Transport: A Greener Future" the United Kingdom acknowledges the need to tackle the country's transport demand through policies that encourage sustainable, low-carbon travel and transport patterns. The ERT encourages the United Kingdom to further report on the specific policies it plans to implement to address this issue in its next national communication.

64. Central to promoting renewable energy sources, in particular biofuels, in the transport sector is the **EU Renewable Energy Directive** and the current Renewable Transport Fuel Obligation. The EU Directive sets a minimum target of 10 per cent for the contribution of renewable energy sources towards total consumption in the transport sector by 2020 and aims to ensure that the use of biofuels in the EU is sustainable. The **Renewable Transport Fuel Obligation** requires suppliers to ensure that the share of biofuels increases to 5 per cent of the fuel blend by 2013–2014. The United Kingdom is currently exploring how best to meet the 10 per cent transport target within the EU Renewable Energy Directive.

65. The ERT notes that only a portion of the estimated cost to implement these measures is secured and that achieving the 10 per cent target of biofuels in 2020 could be challenging. In particular, the ERT notes that the impact assessment of the strategy and its

cost-effectiveness analysis assume biofuel prices that “are derived from outputs produced by a OECD-FAO model”, which do not necessarily reflect the potential additional cost that could arise from applying sustainability criteria on biofuels sources. The ERT therefore encourages the United Kingdom to further analyse the uncertainty associated with the implementation of such criteria and its consequences on expected emission reductions from use of renewable energy sources in the transport sector.

66. **Vehicle fuel efficiency** is planned to be improved through more stringent emission standards linked to the EU-wide standards, such as the EU passenger car performance standards⁵ and the EU new van CO₂ emission standards,⁶ and low-carbon buses. In addition, the United Kingdom encourages the purchase and manufacture of energy-efficient vehicles through the vehicle excise duty and company car tax. The United Kingdom has also committed to invest in market transformation to enhance the share of electric vehicles and plug-in hybrid vehicles through grants and consumer rebates. The ERT encourages the United Kingdom to further report on the specific PaMs it intends to implement in order to foster the development of electric vehicles, including through the development of a large-scale charging infrastructure.

67. In terms of curbing GHG emissions from aviation, the ERT noted that the Air Passenger Duty was strengthened in 2009, which is expected to result in emission reductions of 0.6 Mt CO₂ in the period 2011–2012. During the review, the United Kingdom explained that international aviation, which covers all arriving and departing flights from EU airports, will be included in the EU ETS from 2012 onwards.

68. Through PaMs such as “Act on CO₂” and demonstration projects (e.g. Sustainable Travel Towns and Cities), the United Kingdom is encouraging **behaviour change** towards more environmentally friendly modes of transport. Act on CO₂ is a Government-led multimedia campaign which aims to encourage sustained behavioural change to reduce individual CO₂ emissions.

3. Policies and measures in other sectors

69. In 1990, the combined GHG emissions from all non-energy sectors amounted to 165.0 Mt CO₂, comprising 21.4 per cent of the national total. Between 1990 and 2008, GHG emissions from non-energy sectors decreased by 42.1 per cent, mainly driven by decreases in GHG emissions from industrial processes, agriculture and waste management.

70. **Industrial processes.** Industrial processes emissions decreased by 46.6 per cent in the period 1990–2008. The main reason for the decrease include the implementation of abatement technologies in the chemical manufacturing industry (e.g. reduction of N₂O emissions from nitric acid production due to the implementation of the Integrated Pollution Prevention Control (IPPC) directive and emissions trading schemes; and the introduction of thermal oxidizer pollution abatement equipment at two United Kingdom plants where chlorodifluoromethane (HCFC-22) is manufactured. The decrease in emissions was also a result of the introduction of improved technologies in the non-ferrous metals manufacturing industry (e.g. reduction of PFCs emissions from aluminium production due to the introduction of improved technology and reduction of SF₆ emissions from magnesium production due to partial replacement of SF₆ with 1,1,1,2-tetrafluoroethane (HFC-134a) at the main manufacturing site.

⁵ Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO₂ emissions from light-duty vehicles.

⁶ A new legislative proposal to reduce CO₂ emissions from light commercial vehicles (vans) (28 October 2010).

71. **Agriculture.** GHG emissions from agriculture fell by 21.2 per cent in the period 1990–2008 as a result of decreasing animal numbers, less arable land and decreased use of fertilizer. Most of the PaMs that reduce emissions from agriculture are employed primarily for other purposes such as protecting habitats or reducing nutrient pollution. Measures aimed specifically at reducing emissions from the sector are currently voluntary.

72. The United Kingdom supports industry efforts to reduce emissions through knowledge and advice efforts such as the Farming Futures partnership and is currently researching how to better target these efforts. Incentives such as the Bioenergy Capital Grants Scheme and advanced biorefineries demonstration are aimed at increasing deployment of bio-based electricity, heat and transport biofuels. Because uptake in the Energy Crops Scheme was low, grant funding has been increased and free technical training days are offered to stimulate interest. The UK Renewable Energy Strategy explains that the production and use of bio-based feedstocks for bioenergy should be sustainable, taking into account possible indirect social and environmental impacts. The United Kingdom is considering what further sustainability measures may be required, in line with the EU's Renewable Energy Directive. The ERT noted that the emission reduction estimates associated with the PaMs in this sector were not clearly highlighted.

73. **Forestry.** The LULUCF sector was a net source of 2.9 Mt CO₂ eq in 1990 and became a net sink of 2.0 Mt CO₂ eq in 2008. Low woodland cover is about 12 per cent of the total land area of the United Kingdom and the trend of GHG removed is declining. This is a result of the ageing and harvesting (and subsequent restocking) of much of the large area of woodlands planted in the latter half of the twentieth century, coupled with declining planting rates in recent years. The United Kingdom strives to increase forest land area through the Woodland Grant Scheme, and the Woodfuel Strategy for England outlines an implementation plan for developing this market. However, a lack of private funding and land competition remain barriers to the further enhancement of forest land. The United Kingdom hopes to address these barriers through the establishment of the Woodland Carbon Task Force in March 2010. Policies are also in place to enhance the contribution of the forestry sector to renewable energy targets through woodfuel production as outlined, for example, in the Woodfuel Strategy for England.

74. **Waste management.** In 2008, the waste sector contributed 3.6 per cent to total GHG emissions in the United Kingdom. Emissions from waste have decreased by 57 per cent since 1990, reaching 22.8 Mt CO₂ eq, primarily due to a decline in CH₄ emissions. This decline, as explained in the NC5, is a result of successful implementation and strengthening of the existing policies aimed at efficient waste management (landfill tax and policies to meet the requirements of the EU landfill directive⁷), including introduction of CH₄ recovery systems at landfills and increased diversion of biodegradable waste from landfill. The landfill tax is expected to rise in 2011 from the current rate of GBP 40/tonne to GBP 48/tonne, with further increases being announced up to 2014.

75. Total emissions are projected to fall further to 21.1 Mt CO₂ eq by 2020 (22.8 Mt CO₂ eq in 2008) and the LCTP sets additional reduction target of 1 Mt CO₂ eq by 2020. The United Kingdom plans to reach this target by: reducing the amount of biodegradable waste generated through voluntary commitments and extension of campaigns; diverting more biodegradable waste from landfill (e.g. by extending the landfill tax escalator, increased recycling); and capturing more of the CH₄ produced by landfills through technical guidance to operators and incentives such as the RHI and ROCs. The ERT identified that there might be further reduction potential in wastewater sector. The ERT noted that the NC5 contains an elaboration of the PaMs in the waste sector, which was missing in the

⁷ Directive 1999/31/EC on the landfill of waste.

NC4 and encourages the United Kingdom to continue to report on such PaMs in its next national communication.

4. Minimization of adverse effects in accordance with Article 2, paragraph 3, of the Kyoto Protocol

76. In its NC5 the United Kingdom reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts, on other Parties, especially developing country Parties. Further information on how the United Kingdom strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol, in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2009 NIR, is presented in chapter 2.I of this report.

77. The NC5 outlines the United Kingdom's support for robust assessments of the impact of trade negotiations and the goal to support long-term benefits from the reduction or elimination of tariffs on some products exported by developing countries. The NC5 also outlines the formal commitment by the United Kingdom to spend at least GBP 400 million per year by 2010 as Aid for Trade support at national, regional and global levels. The ERT acknowledged the United Kingdom's commitment to liberalizing trade of environmental goods and services under the Doha process, which aims at reducing domestic support that distorts trade.

C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms

78. The projections presented in the NC5 are based on a set of projections initially published in November 2008 in the document 'United Kingdom's energy and carbon emissions projections' (Updated Energy Projections – UEP37, further referred to in the report as "NC5 projections"). These projections were subsequently updated in April 2009 to reflect new economic growth forecasts (announced in the Government Budget 2009), as well as revised estimates of emission reductions from some policies. The NC5 provides references to the source documents which include detailed sets of projections.

79. During the review, the United Kingdom provided updated information on projections published in July 2009 (UEP38) in the LCTP (further referred to in the report as "most recent projections"). The most recent projections represent the latest projections of GHGs available at the time of the review and are fully consistent with the recent PaMs presented by the United Kingdom during the review. Both sets of projections, the NC5 projections and the most recent projections, are covered in this report.

1. Projections overview, methodology and key assumptions

80. The GHG emission projections provided in the NC5 include a 'with measures' scenario until 2020, presented relative to actual inventory data for the period 1990–2006. Actual inventory data are presented for the years 1990, 1995, 2000, 2005 and 2006, and projected emissions are presented for the years 2010, 2015 and 2020.

81. Both actual inventory data and projected emissions are presented according to two types of geographical coverage "UNFCCC coverage" (which covers the territory of the United Kingdom, Crown Dependencies and Overseas Territories) and "United Kingdom only". The differences between projected emissions for 2020 for the two types of geographical coverage are less than 0.5 per cent for all sectors except for the LULUCF sector, where the relative difference is 3.6 per cent (0.1 Mt CO₂ eq). The ERT notes that

these differences are relatively small in comparison with the uncertainty associated with emission projections and therefore encourages the United Kingdom to provide projections for a single geographical coverage in its next national communication.

82. Both actual inventory data and projected emissions are presented on a gas-by-gas basis for the following GHGs: CO₂, CH₄, N₂O, PFCs, HFCs and SF₆. Projections are also provided in an aggregated format for each sector as well as for a national total, using the relevant global warming potential values. Both actual inventory data and projected emissions are also presented by sector (energy supply, business, industrial processes, transport, residential, public, agriculture, LULUCF (net) and waste management) and by end-user (business, industrial processes, transport, residential, public, agriculture, LULUCF (net), waste management, exports and Overseas Territories). In the classification of emissions by end-user, emissions from power stations, refineries and other energy supply industries are re-allocated to end-users of electricity, petroleum products, and other fuels.

83. However, the ERT noted that the sectoral categories used in the projections section are not fully consistent with those used in the PaMs chapter and that no explanation of the correspondence between the sectoral categories used and the CRF categories was provided. The ERT encourages the United Kingdom to improve the consistency between chapters and use the sector definitions recommended in the UNFCCC reporting guidelines in its next national communication.

84. The ERT noted that in most cases, total emission projections include the net effects of emissions and removals from activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol, which is not always transparent. To enhance the transparency of reporting, the ERT encourages the United Kingdom to clearly distinguish between total emissions and removals, and between net emissions and traded allowances in its presentation of emissions and projections in its next national communication.

85. The ERT noted that the NC5 does not present any emission projections related to fuel sold to ships and aircraft engaged in international transport, and recommends that the United Kingdom report such emission projections separately, and not included in the totals, in its next national communication.

86. The definition of the 'with measures' scenario used by the United Kingdom is not fully consistent with that of the UNFCCC reporting guidelines, as it includes the impacts of PaMs defined as "firm and funded", which are not necessarily adopted and implemented PaMs. For example, the ERT noted that two of the PaMs included in the 'with measures' scenario and reported in annex B to the NC5 are defined as "planned" or "to be implemented". The ERT recommends that the United Kingdom clarify the status of the PaMs included in its emission scenarios, and ensure that the definitions used are compatible with those provided in the UNFCCC reporting guidelines ("implemented", "adopted" and "planned" PaMs). The ERT noted that the LCTP presented emission savings from additional planned PaMs. It encourages the United Kingdom to provide 'with additional measures' and 'without measures' projection scenarios in its next national communication.

87. The **methodology** used to prepare projections, which is based on several models, is clearly presented in the NC5. Projections of CO₂ emissions from energy are prepared and published by DECC at least once a year using DECC energy model. This model is based on a partial equilibrium energy model which optimizes the cost of competing technologies (bottom-up supply side) to meet energy demand (top-down). The DECC energy model requires a set of key assumptions including the level of economic growth, international fossil fuel prices, population, etc. This model has been subject to reviews by various organizations such as the National Audit Office (2006) and Oxford Economics (2008), and modelling assumptions undergo a consultation process with a Projections Advisory Group

established by the Government, to which economists and industry representatives contribute.

88. The projections of CO₂ from LULUCF are modelled separately by the Centre for Ecology and Hydrology under contract with DECC. Assumptions take into account current trends of land-use change and forest planting and apply high, medium (business as usual) and low emission projection scenarios to 2020. The approach uses land-use data derived from periodic surveys, supplemented by annual statistics on land management activities. It is combined with information on soil carbon density and dynamics to estimate annual gains and losses from land transitions.

89. The emissions projections of non – CO₂ GHGs are produced separately by AEA Technology under contract with DECC and are consistent in terms of results and sector-specific assumptions with the DECC energy model. Projections are calculated using a system that complements the national inventory system and is based on forecast activity data, emission factors and various other sector-specific assumptions for each of the main sources calculated for each year from 2005 to 2050. These include consultation with experts and stakeholders from Government departments, industry and various organizations, technical literature and incorporating the results of studies undertaken by DECC.

90. The NC5 presents **key assumptions** on projected annual economic growth and projected international fuel prices for the years 2005, 2010, 2015 and 2020 and on population growth for the year 2031. The ERT suggests that the United Kingdom provide information on projected population in a time series consistent with the presentation of other assumptions, as well as additional data on other key projections parameters such as: power generation mix, final energy consumption and carbon price. The ERT noted that detailed information on assumptions regarding projection parameters and approaches for policy appraisal is presented in a number of documents, which are publicly available from the DECC website. The ERT commends the United Kingdom for such transparency regarding the assumptions used for GHG emission projections.

91. The ERT notes that the NC5 does not present **sector-specific information** on factors and activities that would provide the reader with an understanding of emission trends and projections during 1990–2020. The ERT recommends that the United Kingdom provide such information in its next national communication.

92. Various projection scenarios are prepared using a range of fossil fuel prices, growth of GDP and level of policy delivery. These scenarios include the central projection, the high price projection, and the low growth projection. They provide valuable information on the **sensitivity of the projections** to different key assumptions and inform the levels of uncertainty associated with the central projections. Fuel prices are most uncertain. Four sets of fuel price assumptions are used to reflect four different scenarios of potential future global fuel markets. The NC5 includes a description of underlying assumptions to which projections are sensitive and presents the results of a quantitative probabilistic analysis. However, neither these underlying assumptions nor the sensitivity of the results to these are discussed. The ERT encourages the United Kingdom to include in its next national communication a brief discussion on the sensitivity related to these.

93. The ERT notes the high level of uncertainty associated with expected emission reductions in the agriculture and the waste sectors and encourages the United Kingdom to further define the policies and measures which will be implemented to achieve expected emission savings by 2020. The analysis of the uncertainty range for the net United Kingdom carbon account presented in the annex to the LCTP indicates a 95 per cent degree of confidence that this account will fall within the range, based on the central economic growth forecast. Projections of the net United Kingdom carbon account are subject to an

uncertainty range of ± 3.5 per cent in the period 2008–2012, ± 4.5 per cent in the period 2013–2017 and ± 6.5 per cent to ± 5 per cent in the period 2018–2022. Additional information provided by the Party during the review indicates that the uncertainty for projections of total GHG emissions ranges from ± 9.4 per cent to ± 8.4 per cent in 2010 and from ± 15.6 per cent to ± 14.0 per cent in 2020. The ERT encourages the United Kingdom to report on uncertainty of projections of GHG emissions in its next national communication.

94. The approach, assumptions and institutional arrangements to prepare GHG emission projections are consistent with the approach taken in the third and fourth national communications. The main differences in ‘with measures’ projections between the NC4 and the NC5 relate to new assumptions on input parameters and policy impacts, such as higher fossil fuel price assumptions, lower economic growth and the inclusion additional policy announced in the Energy White Paper 2007. The projections in the NC5 also take into account improvements to inventory assessments, such as updates to the landfill CH₄ model and other improvements to methods, emission factors and activity data. Quantified differences in projected emissions are presented in a tabular format in the NC5.

2. Results of projections

95. Table 4 and the figure below show that the United Kingdom plans to meet its Kyoto target to reduce GHG emissions to 12.5 per cent below base year level during 2008–2012, which the Party intends to achieve by domestic efforts. Moreover, the United Kingdom continues to revise and enhance domestic policies to curb its GHG emissions beyond its commitments under the Convention and the Kyoto Protocol. The ‘with measures’ scenario in the LCTP indicates a continuous decrease of emissions during 2009–2050 against the backdrop of a 19 per cent decrease in total emissions in 2008 below base year levels. In 2010, emissions are projected to be already 25.3 per cent below the Kyoto base year level. Carbon removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, are expected to provide further average annual emission reductions by 1.4 Mt CO₂ eq (or 0.2 per cent of base year emissions) during the commitment period.

Table 4

Summary of greenhouse gas emission projections for the United Kingdom

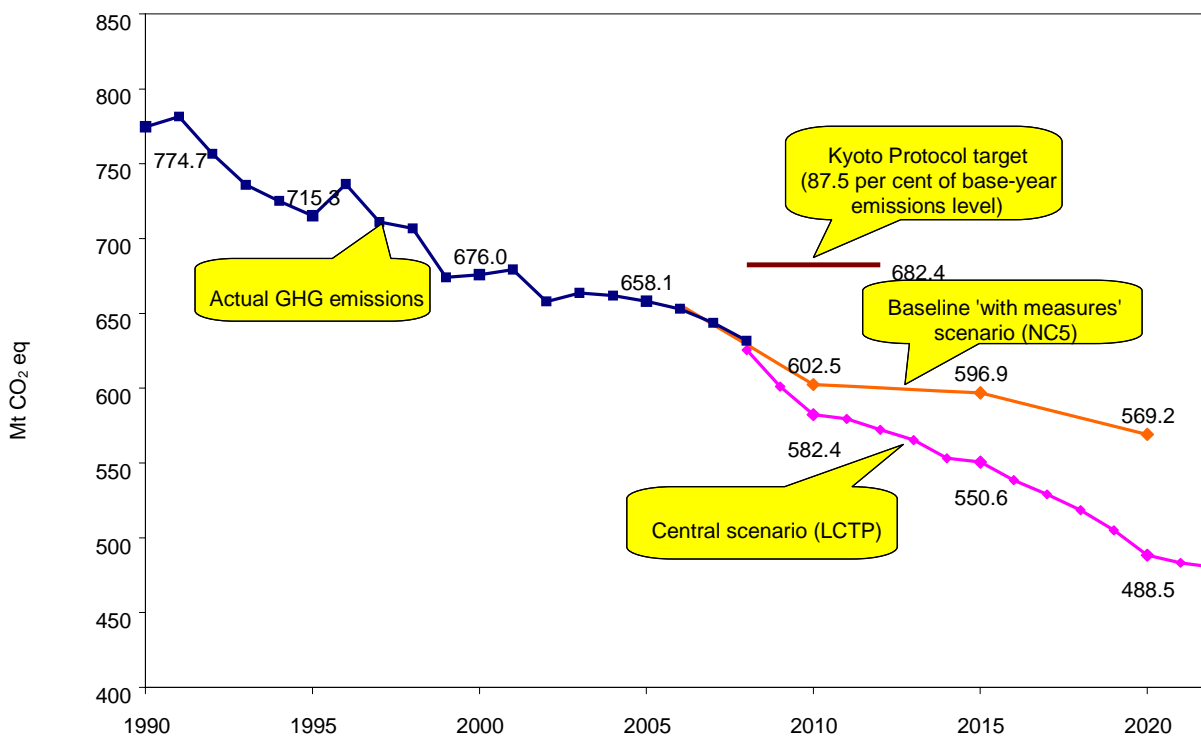
	<i>Greenhouse gas emissions (Tg CO₂ eq per year)</i>	<i>Changes in relation to base-year level under the Kyoto Protocol (%)</i>	<i>Changes in relation to 1990 level (%)</i>
Inventory data 1990 ^a	774.7	– 0.7	0.0
Inventory data 2008	631.7	– 19.0	–18.5
Kyoto Protocol base year ^b	779.9	0.0	0.7
Kyoto Protocol target ^b	682.4	–12.5	–11.9
‘With measures’ projections for 2010 ^c	582.4	–25.3	–24.8
‘With measures’ projections for 2015 ^c	550.6	–29.4	–28.9
‘With measures’ projections for 2020 ^c	488.5	–37.4	–36.9

^a Data source: The United Kingdom’s 2009 greenhouse gas (GHG) inventory submission; the emissions are without land use, land-use change and forestry (LULUCF).

^b Based on the initial review report contained in document FCCC/IRR/2007/GBR.

^c United Kingdom’s national strategy for climate and energy (The UK Low Carbon Transition Plan, July 2009), which provides updated projections compared with those in the United Kingdom’s fifth national communication; the projections were provided by the Party during the in-depth review;
Note: The projections are for GHG emissions without LULUCF, excluding emission reductions or increases resulting from purchases or sales of allowances through the European Union emission trading scheme.

Greenhouse gas emission trends and projections in the United Kingdom



Data sources: (1) Data for the years 1990–2008: United Kingdom’s 2010 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry. (2) Data for the years 2009–2020: United Kingdom’s national strategy for climate and energy (The UK Low Carbon Transition Plan, July 2009), which represent updated projections compared to the United Kingdom’s fifth national communication and were provided by the Party during the in-depth review.

96. The largest projected emission reduction by 2010 compared with 1990 is attributed to the energy supply sector (84.0 Mt CO₂ eq), where fuel switching to gas and higher output in nuclear plants between 1990 and 2000 led to a sharp emission decrease. Further emission reductions are projected until 2010 in this sector, due to the contraction of the economy during 2007–2008 and the effect of existing policies. The second largest emission reduction by 2010 is expected to come from industrial processes (38 Mt CO₂ eq), where the introduction of abatement equipment to control fugitive emissions from adipic acid production resulted in considerable reductions between 1990 and 2000. This is followed by reductions from the waste sector (reduction of CH₄ emissions from landfill sites due to increased collection of landfill gas for energy recovery and flaring) (30 Mt CO₂ eq) and in the business sector (25 Mt CO₂ eq. Significantly, after a continuous increasing trend since 1990, transport emissions are now projected to start decreasing by 2010 despite the projected continuation of increasing transport demand trends, chiefly as a result of improved vehicle efficiency and other policy measures.

97. Emissions projections and appraisal of the effects of PaMs in the NC5 and in the LCTP have been prepared using distinct carbon prices for emissions in sectors covered by the EU ETS and in the other sectors. Short-term traded prices of carbon of GBP 15 in 2010 and GBP 25 in 2020, and short term non-traded prices of carbon of GBP 52 in 2010 and GBP 60 in 2020 per tonne CO₂ eq have been used. The ERT noted that observed market carbon prices in 2010 are more consistent with the lower bound assumption than with the central assumption, while 2020 projected carbon prices are lower than those provided by other sources. Given the crucial role played by the traded carbon price in setting capital costs of long-term investments in energy infrastructures, the ERT encourages the United Kingdom to further develop its analysis of the uncertainty and sensitivity of emission projections with regard to carbon price assumptions and to summarize the results of such an analysis in its next national communication.

98. The ERT noted that achieving the significant reductions in final energy demand currently projected (–19 per cent in 2020 compared with the ‘business as usual’ scenario) relies on the full delivery of emission savings from policies aiming to increase the supply of renewable energy and to improve the United Kingdom’s energy efficiency (in particular in the business and residential sectors). The ERT acknowledges the need for full delivery of centralized government initiatives at local authority level, introducing proper incentives (in particular to meet very ambitious renewable heat targets), and effective and targeted communication. The ERT encourages that the United Kingdom monitor the progress in achieving such targets, including by using appropriate indicators.

99. On renewable energy sources, projections assume that as a result of the implementation of the UK Renewable Energy Strategy the share of electricity generated from renewable energy sources by 2020 will reach around 30 per cent compared with the current share of 5 per cent. Also, projections assume that by 2020, 12 per cent of heat will be generated from renewable energy sources, up from the current very low levels.

100. Nuclear energy generation is expected to fall in the medium term, as plants retire from the system, but from around 2020 onwards, generation from nuclear plants rises again as new plants are constructed. Projections assume that one nuclear station of around 1.6 GW will be operating in 2020. The ERT notes the efforts of the United Kingdom to bring forward nuclear energy without public subsidy and to address regulatory barriers to the development of nuclear generation (through pre-licensing of plant designs, and other rationalizing of the planning process) to limit the risk of high nuclear energy costs. The ERT also notes the high ambition level corresponding to the rapid increase in nuclear capacity in the next 10 to 15 years. This relies on timely involvement of the private sector to build such new nuclear plants while current firm financial engagement by private sector remains extremely limited.

101. Under the United Kingdom regulatory framework for coal, no new coal plant will be built in the country without a CCS demonstration. The United Kingdom envisages in its projections that, four CCS demonstration plants (including an unabated portion) will replace some of the existing coal-fired power stations (which are due to close over the next five years), with the first plant commencing operation in 2014. The Party expects CCS technology to be ready for wider deployment from 2020 so that any demonstration plant built up to 2020 would be retrofitted to full CCS by 2025, while any new coal plant built after 2020 would be fully CCS. The ERT encourages the United Kingdom to report on its actions to demonstrate economic viability of CCS generation under current market conditions in order to ensure the timely deployment of CCS as currently planned.

102. Transport fuel demand is projected to increase from 2010 after a slight fall following the high prices and economic recession. Projections assume that the United Kingdom will achieve its target agreed under the EU renewables directive of 10 per cent of transport energy from renewable energy sources by 2020, up from the current level of 2.5 per cent of

road transport energy consumption. Projections assume that road transport fuels will represent about one third of a 10 Mtoe increase in total renewable final energy demand. The largest source of emission reductions in the transport sector by 2020 is expected to be achieved by increasing the use of renewable fuels for transport.

3. Total effect of policies and measures

103. The ERT noted that the United Kingdom did not provide any estimate of the total effect of its PaMs in its NC5. During the review the United Kingdom explained the reasons for not presenting such an estimate in the NC5, namely that the sum of the estimates of individual PaMs reported in annex B would have provided an incorrect estimate due to policy overlaps. The ERT emphasizes the fact that the total effect of PaMs does not have to match exactly the sum of the individual effects of PaMs; nevertheless, it should be consistent with the policies included in the 'with measures' scenario and, in accordance with the UNFCCC reporting guidelines, account for any policy overlap or synergies in order to avoid double counting. The ERT recommends that the United Kingdom evaluate the total effect of PaMs and report on it in its next national communication.

104. Conversely, the LCTP contains an estimate of the total effect of policies included therein, obtained by using a new accounting methodology, and a baseline scenario which includes all policies existing before those set out in the LCTP. The baseline scenario is compared with the total effect of PaMs from the LCTP, which comprises the effects of PaMs in the trading and non-trading sectors presented separately. Importantly, the new methodology uses sequential modelling of the effects of policies to identify only the additional effect of the policy. This leads to substantial revisions of emission reductions from some policies compared with estimates contained in the NC5. The ERT commends the United Kingdom for its efforts to develop and make publicly available such a methodology.

105. According to the LCTP, the overall effects of policies and proposals announced in the LCTP and those in the LCTP baseline between 2018 and 2020 are estimated to be 393 Mt CO₂ eq for sectors covered by the EU ETS (83 Mt CO₂ eq in 2020) and 335 Mt CO₂ eq for non-trading sectors (70 Mt CO₂ eq in 2020). Effects of PaMs between 2018 and 2022 from individual sectors are estimated as follows: 149 Mt CO₂ eq (31 Mt CO₂ eq in 2020) from transport, mainly due to existing EU voluntary agreements on new car average CO₂ fuel efficiency standards and due to the rapid development of biomass use for transport, 106 Mt CO₂ (22 Mt CO₂ eq in 2020) from homes and communities, mainly due to obligations for energy suppliers and existing building regulations; 60 Mt CO₂ (13 Mt CO₂ eq in 2020) from workplaces and jobs, mainly due to the expected effects of the renewable heat incentive and energy efficiency improvements achieved through climate change agreements; and 20 Mt CO₂ (4 Mt CO₂ eq in 2020) eq from the agriculture, LULUCF and waste sectors.

106. As the LCTP does not provide separate estimates for the effects of implemented and adopted PaMs as required by the UNFCCC reporting guidelines, the ERT estimated the effects using estimates of emission savings of individual PaMs and the status of their implementation provided in the LCTP. Table 5 presents the effects of implemented and adopted measures as well as the effects of planned measures calculated by the ERT.

Table 5

Projected effects of planned, implemented and adopted policies and measures in 2010 and 2020

Sectors	<i>Effect of implemented and adopted measures^{a,b}</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of planned measures^{b,c}</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of implemented and adopted measures^{a,b}</i>	<i>Relative value (% of 2005 emissions)</i>	<i>Effect of planned measures^{b,c}</i>	<i>Relative value (% of 1990 emissions)</i>
	(Tg CO ₂ eq)		(Tg CO ₂ eq)		(Tg CO ₂ eq)		(Tg CO ₂ eq)	
	2010				2020			
Total traded sector	21.2	2.7	NA	NA	82.5	10.6	NA	NA
Total non-traded sector	18.7	2.4	0.1	0.0	57.6	7.4	12.0	1.5
Total effect of policies and measures ^d	39.9	5.2	0.1	0.0	140.1	18.1	12.0	1.5

Data sources: The expert review team estimates based on the data for the effects of individual policies and measures (PaMs) provided in the United Kingdom's national strategy for climate and energy (the Low Carbon Transition Plan (LCTP));

^a The estimates include emissions savings from policies included in the baseline scenario and the additional measures set out in the LCTP, as reported in the LCTP.

^b The savings from policies that reduce emissions in the United Kingdom in the traded sector correspond to carbon unit savings. These will not affect the level of European Union wide emissions or the net United Kingdom carbon account, but will reduce the Party's net import of carbon units, with associated economic benefits.

^c Effect of planned measures includes estimated further intended emissions savings from the additional measures set out in the LCTP.

^d Total effect of PaMs does not include the effect of macroeconomic interaction.

Abbreviation: NA = not available.

4. **Supplementarity relating to mechanisms pursuant to Article 6, 12 and 17**

107. The United Kingdom in its NC5 provided sufficient information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. The United Kingdom Government is not planning to make use of the Kyoto Protocol mechanisms to meet its first commitment period target under the Kyoto Protocol, and will therefore achieve this target entirely through domestic action. This is supported by the Carbon Accounting Regulations⁸ that set a limit of zero on the purchase of credits for the first commitment period 2008–2012, excluding units bought by the United Kingdom companies that participate in the EU ETS, and ensure that any carbon units in excess of the budget are cancelled and therefore not used to offset GHG emissions in the United Kingdom or elsewhere during that period. In accordance with the EU Linking Directive, such companies can meet their legal obligations under the EU ETS, with a maximum use of 8 per cent of their annual cap. This amounts to total units that are equivalent to around 2.5 per cent of the United Kingdom's base year emissions.

⁸ Statutory instruments. 2009. Carbon accounting regulations, No 1257.

D. Vulnerability assessment, climate change impacts and adaptation measures

108. In its NC5 the United Kingdom has demonstrated advanced efforts and a solid institutional set-up and regulatory framework to address vulnerability and adaptation at domestic and international levels. It also reported on its support of a wide range of initiatives on adaptation, including capacity-building activities, in developing countries, especially those that are particularly vulnerable to the adverse effects of climate change. The ERT noted that despite the significant number of adaptation strategies that are being developed and/or implemented in response to anticipated impacts on different sectors, little information on these initiatives, for example on adaptation to impacts on human health, is given in the NC5. The ERT also noted the limited information reported in NC5 regarding biodiversity and ecosystems conservation whereas more relevant information was provided during the review. The ERT encourages the United Kingdom to reflect all key adopted and planned adaptation measures by different sectors/departments in its next national communication.

109. In its NC5, the United Kingdom has provided the required information on the expected impacts of climate change in the country and on adaptation options applied. However, the ERT noted that it did not provide sufficient information on the expected impacts of climate change on some important sectors such as the fisheries sector or on adaptation options for human health and for natural ecosystems.

110. The ERT noted that the Climate Change Act creates a statutory framework for adapting to climate change in the United Kingdom. The United Kingdom government has set up the Adapting to Climate Change Programme.⁹ This programme aims to coordinate adaptation work in England. Scotland, Northern Ireland and Wales also have adaptation work programmes. As set out in the Climate Change Act, the Programme will be statutory from 2012 and will then be reviewed every five years. The programme will address the risks identified in the United Kingdom wide Climate Change Risk Assessment, which is also to be performed every five years. The first Climate Change Risk Assessment is due to be presented to Parliament by January 2012. An Adaptation Sub-Committee to the Committee on Climate Change has been established. This Sub-Committee will provide advice, analysis and information on the Climate Change Risk Assessment and the implementation of the Adapting to Climate Change Programme. The Sub-Committee will provide advice and technical scrutiny to Government and Parliament through the Committee on Climate Change.

111. While in the NC4 the “Vulnerability and adaptation assessment” focused mainly on vulnerability and impacts, particularly concerning natural ecosystems, the NC5 “Adapting to climate change” chapter emphasizes adaptation as an ongoing process and highlights a number of adaptation strategies and guidance. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

112. Current climate projections describing how the climate of the United Kingdom might change by 2099 suggest continuous warming up to at least the end of the century. The projections vary from place to place, for example under a medium emissions scenario (SRES A1B) in the time period 2070–2099, the projected mid-range mean temperature for the summer is 3.9 degrees higher for south-east England, and 3.0 degrees higher in northern Scotland. Other changes suggested by the projections include less summer rainfall and increased winter rainfall, more extreme weather events such as intense rainfall events, and rising sea levels. The ERT noted that the United Kingdom identified a number of potential

⁹ <www.defra.gov.uk/adaptation>.

benefits from climate change through a series of regional scoping studies undertaken with the support of the United Kingdom Climate Impacts Programme.

113. The NC5 reports information on adaptation measures including, for example, adaptation strategies for water resources and a programme on adaptation to floods. The current water strategy for England, *Future Water*,¹⁰ sets out a framework for water management in England and requests water companies to prepare and maintain drought plans. The Government programme “Making Space for Water” addresses adaptation to floods with regard to planning, urban and rural development, agriculture, transport, nature conservation and conservation of the historic environment. During the review the United Kingdom provided additional information and identified good examples related to biodiversity and nature conservation¹¹ and related research, for example the MONARCH (Modelling Natural Resource Responses to Climate Change) study. The ERT noted an example of an innovative adaptation measure being considered by the Party: an adapting to climate change indicator (NI188) in the Local Government Performance Framework for England, which allows authorities and partners to measure progress in adapting to climate change over five levels.

114. Through DECC and DFID, the United Kingdom is working internationally on adaptation through the UNFCCC and bilateral agreements. For example, it provided GBP 130 million of support to the 15 international research centres of the Consultative Group on International Agricultural Research, supported such initiatives as the South Asia Water Initiative and bilateral collaborative research projects in China and India. The United Kingdom is also supporting capacity-building in developing countries on issues such as assessment of risks and vulnerabilities. DFID has committed funds to a number of regional projects such as Climate Change Adaptation in Africa and the Climate for Development in Africa Programme.

Table 6

Summary of information on vulnerability and adaptation to climate change

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	<p><i>Vulnerability:</i> Agriculture and horticulture potential to grow new crops, reduced yield for others, more/different pests and diseases.</p> <p><i>Adaptation:</i> Minimization of negative impacts through changes in agricultural practices is planned.</p>
Biodiversity and natural ecosystems	<p><i>Vulnerability:</i> Changes in the timings of seasonal events, leading to loss of synchrony between species and the availability of food, and other resources upon which the species depend; shifts in suitable climatic conditions for individual species leading to changes; distribution of these species; changes to the composition of plant and animal communities.</p> <p><i>Adaptation:</i> Guidance, on behalf of the United Kingdom Biodiversity Partnership, for those delivering conservation, summarizing how existing plans and projects can adapt to climate change.</p>
Coastal zones	<p><i>Vulnerability:</i> Faster rates of coastal erosion and increased frequency of coastal flooding. Storm surges are expected to be experienced more frequently – by 2100 they could occur</p>

¹⁰ <www.defra.gov.uk>.

¹¹ <<http://www.defra.gov.uk/environment/biodiversity/documents/ebs-ccap.pdf>>.

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Drought and floods	<p>up to 20 times more frequently for some coastal locations; continuing global sea level rise – by 2100 it could have risen by as much as 80cm around some parts of the United Kingdom coast.</p> <p><i>Adaptation:</i> Embedding flood and coastal erosion risk management across a range of United Kingdom Government policies, including planning, urban and rural development, agriculture, transport, nature conservation and conservation of the historic environment; introduction of higher standards for building new affordable housing.</p> <p><i>Vulnerability:</i> More frequent periods of heavy rainfall, especially in winter, leading to increased flooding.</p> <p><i>Adaptation:</i> Working with the Department of Communities and Local Government to investigate the possibility of strengthening adaptation within the planning process, including mechanisms such as the Building regulations and the Code for Sustainable Homes.</p>
Forests	<p><i>Vulnerability:</i> Forestry – it is expected increase of frequency of water logging in winter, limiting access for management activity and enhancing the risk of wind blow and changing frequency and severity of tree disease and insect pest outbreaks; changes will also be seen in the distribution of species and the composition of native woodland vegetation communities; increased drought risk, wind and fire risk.</p> <p><i>Adaptation:</i> The Forestry Commission has drafted and consulted on new climate change guidelines, including on adaptation, to underpin the United Kingdom Forestry Strategy. One of the core aims of the Strategy for England’s Trees, Woods and Forests is to increase the resilience of trees, woods and forests to climate change. In Scotland the Forestry Strategy is aimed at improving understanding of climate change impacts on woodland ecosystems and silviculture, and implementing precautionary measures, such as forest habitat network creation. It is planned to maintain preventative measures and ensure readiness for pests, diseases and other threats, such as fire and wind; and to increase the role of forestry in environmental protection including sustainable flood and catchment management, and soil protection.</p>
Human health	<p><i>Vulnerability:</i> Reduced winter mortality; more heat-related health problems.</p> <p><i>Adaptation:</i> Working with the Department for Children, Schools and Families, the Department for Work and Pensions and the Department of Health to consider the social impacts of climate change and ways to reduce the susceptibility of the most vulnerable members of society to the harmful impacts.</p>

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Infrastructure and economy	<p><i>Vulnerability:</i> Water and sewerage infrastructure – increased risk of summer water shortages; increase in water quality problems; Solid waste management – increased rate of degradation and leaching at landfill sites; Transport – less risk of disruption from cold weather and fog, increased pressure on infrastructure due to heat, changing rainfall patterns and extreme weather events; Energy – infrastructure and networks vulnerable to flooding, storms and extreme heat.</p> <p><i>Adaptation:</i> It is planned to ensure that key transport networks – national, international, city and regional continue to operate effectively build on initiatives already underway to develop a coherent, system-wide picture of the biggest transport risks and the most cost-effective remedies</p>
Water resources	<p><i>Vulnerability:</i> Higher water demand, more widespread water stress with increased risk of drought, more water quality problems, as well as more extreme downpours with a higher risk of flooding.</p> <p><i>Adaptation:</i> Defra has published “Future Water”, which sets out a long-term vision for water policy and management; by 2030 it is expected that continuous adaptation would be embedded to climate change throughout the water sector.</p>

E. Financial resources and transfer of technology, including information under Articles 10 and 11 of the Kyoto Protocol

1. Provision of financial resources, including “new and additional” resources and resources under Article 11 of the Kyoto Protocol

115. In its NC5 the United Kingdom provided details on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention as required by the UNFCCC reporting guidelines and those under Article 11 of the Kyoto Protocol as required by decision 15/CMP.1. In particular, it provided information on a broad range of activities with the partner developing countries and institutions seeking to build capacity and deliver action on climate change mitigation and adaptation. The United Kingdom has also provided detailed information on the assistance to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them meet the costs of adaptation to those adverse effects, as well as information on other financial resources related to the implementation of the Convention provided through bilateral regional and other multilateral channels.

116. The information provided in the NC5 covers almost all the issues on which information is required under the Convention and its Kyoto Protocol, except table 6 of the UNFCCC reporting guidelines. However, the ERT noted a lack of consistency between the information reported in the text of the NC5 and the figures as presented in the tables. During the review, the information was updated and considerably extended and the inconsistencies were corrected. The United Kingdom also provided a simplified table of these financial resources for the period 2008–2009, which is reflected in table 7.

Table 7

Summary of information on financial resources

<i>Institution or programme</i>	<i>Contribution 2008–2009 (GBP millions)</i>
UNFCCC funds such as SCCF, LDCF and other voluntary funds	4.5
Climate Investment Funds (includes first year of contributions to the Forest Carbon Partnership Facility and the Congo Basin Forest Fund)	100
REEEP (includes funding to the Renewable Energy International Law Network)	2.5
International Climate change subscriptions (including UNFCCC)a	1.6
Asian Development Bank	0.76
Inter-American Development Programme	3.4
Clean Energy Investment Frameworks (World Bank)	5.01
Adaptation Fund	0.5
UNCCD	0.45
UNEP	1
G8 regional workshops	0.27
G8 regional dialogues	0.25
Supporting developing country negotiators	0.1375
Climate Technology Initiative	0.013
Total	120.39

^a Financial year contributions based on IDA15 contribution amount to GBP 2.134 billion over three years (1 July, 2008 to 30 June, 2011) and IDA 14 contributions amounted to GBP 1.43 billion over three years (1 July, 2005 to 30, June 2008).

Abbreviations: LDCF = Least Developed Countries Fund, REEEP= Renewable Energy and Energy Efficiency Partnership, SCCF = Special Climate Change Fund, UNCCD = United Nations Convention to Combat Desertification, UNEP = United Nations Environmental Programme.

117. The United Kingdom is among the largest donors to the funds dedicated to issues related to climate change. The Party is the fourth largest donor to the Global Environment Facility (GEF) having committed GBP 140 million over 2006–2009. It supplements the funds provided for sustainable national development from national resources and by aid donors and international development agencies. The United Kingdom is the second largest donor to the Least Developed Countries Fund (LDCF) having committed GBP 12 million over the period 2006–2009 of which GBP 7 million has been disbursed and the Special Climate Change Fund having committed GBP 10 million which has been fully disbursed. In addition to the GEF and LDCF, multilateral institutions to which the United Kingdom has contributed financial resources include the World Bank, the International Finance Corporation, the African Development Bank, the European Bank for Reconstruction and Development, the Inter-American Development Programme, the United Nations Development Programme, the United Nations Environment Programme, the UNFCCC and the World Meteorological Organization.

118. The United Kingdom has indicated its increased efforts with regard to international climate change over the period 2006–2009 and has provided “new and additional” financial resources pursuant to Article 4, paragraph 3, of the Convention. During 2006–2009 the bilateral and regional contributions amounted to GBP 202.56 million and the multilateral institution and programme contributions to 1,700 million, making total of GBP 1903 million. However, the ERT noted the lack of clarification in the NC5 on how such

resources can be considered “new and additional”. During the review, the United Kingdom informed the ERT that it was aiming to allocate 0.7 per cent gross national income to official development aid by 2013. They explained that the United Kingdom’s spending on climate was considered additional because it was coming out of increased contributions to aid programmes and new because it had meant increased spending on climate. The ERT recommends that the United Kingdom describe how it defines “new and additional” financial resources in its next national communication.

119. Overall, the ERT felt that, given the amount and scope of financial assistance provided by the United Kingdom, more detailed information could be provided in this chapter, including more transparent presentation of financial resources provided by United Kingdom through bilateral, regional and other multilateral channels.

2. Activities related to transfer of technology, including information under Article 10 of the Kyoto Protocol

120. In its NC5, the United Kingdom reports that technology transfer is provided mainly through its bilateral and multilateral activities, including transfer of technology under Article 10 of the Kyoto Protocol. However, the Party did not provide a clear distinction between activities undertaken by the public sector and those undertaken by the private sector. During the review the United Kingdom informed the ERT about its efforts to promote leveraging of private funds such as pension funds to support technology transfer. The NC5 describes some of the bilateral/regional projects on climate mitigation and adaptation that aimed at facilitating technology transfer. However, lessons learned, success or failure stories or technology/technologies transferred are not reported. During the review, the Party presented the ERT with some examples of success stories. The ERT recommends that the United Kingdom use table 6 of the UNFCCC reporting guidelines to report information on projects or programmes aimed to facilitate technology transfer in its next national communication.

121. The ERT noted that the United Kingdom promotes and enhances developing countries’ access to financing for clean technologies by undertaking or participating in initiatives such as the Renewable Energy and Energy Efficiency Partnership, the Climate Change and Energy Programme.

122. In relation to technology transfer, the ERT learned that the United Kingdom has pioneered some initiatives such as providing of funding to remove barriers to renewable energy and energy efficiency in India and cooperating with China on clean energy, energy efficiency and demonstrating potential for near zero emissions from coal. Moreover, the Met Office Hadley Centre and a consortium of United Kingdom universities are transferring state-of-the-art modelling expertise on climate change to developing countries. The United Kingdom underlined that the priorities for technologies to be transferred are determined by the needs of the recipient Party.

F. Research and systematic observation

123. The United Kingdom has provided a complete report on the status of research and systematic observation (RSO), including all the required information on its actions relating to RSO and addressed both domestic and international activities, such as activities within the World Climate Programme, the International Geosphere–Biosphere Programme, and the Global Climate Observing System. The ERT acknowledged the United Kingdom is among the leading countries in the area of research and systematic observation. It also acknowledged the broad range of activities taken to support related capacity-building in developing countries.

124. The NC5 reported that climate research is directly linked with policy making and is regarded as high priority by the Government, and that the research programme on climate change is sponsored by the Government, the Devolved Administrations and research councils. Some research is increasingly being funded from different stakeholders in both the public and the private sectors, particularly in the area of climate impacts and adaptation. The aim of the Government supported research is to support a range of responsibilities and policy requirements as well as developing stronger cooperation between relevant research institutions.

125. The United Kingdom is currently working with international partners to enable delivery of a set of research and tailored advisory services on climate change and development. In this regard the United Kingdom has funded a number of Regional Economics of Climate Change Studies which explore alternative mitigation scenarios for key countries and developing regions, and the costs and benefits of adaptation. For example, the Government provided GBP 200,000 in support of an economic study that comprised assessment of the impacts of climate change on Mexico, analysis of the costs of adaptation to climate change, analysis of the costs and benefits of mitigating climate change and policy recommendations. Studies have also been conducted in Brazil, South-East Asia, Central America, the Caribbean and East Africa.

126. The ERT noted several new developments in the field of research, such as “Living With Environmental Change” (started in 2007, GBP 1 billion) a 10-year interdisciplinary research and policy partnership programme led by the Natural Environment Research Council (NERC), involving other funders of environmental research in the United Kingdom and research councils; and the AVOID programme, which aims to provide policy-relevant evidence and research on avoiding dangerous climate change.

127. A number of national agencies and organizations in the United Kingdom and its Overseas Territories are involved in climate change observation. The United Kingdom Met Office is the national meteorological agency and leads in making and collecting meteorological and atmospheric observations and the Hadley Centre within the Met Office leads in climate research. Observations are also made by others including the NERC Centres and Surveys. The United Kingdom actively contributes to the Implementation Plan of the Global Observation System, as well as to atmospheric and oceanic observations through the relevant networks.

128. The ERT noted that the United Kingdom is very actively promoting and cooperating in scientific and technical research and systematic observation of the climate system in accordance with its commitments under the Convention. The ERT encourages the United Kingdom to report on opportunities for research and expected constraints and barriers as well as efforts to overcome them, in its next national communication.

G. Education, training and public awareness

129. In its NC5, the United Kingdom has provided more extensive information on its actions relating to education, training and public awareness than was provided in the NC4. The ERT noted however, that chapter 8, “Education, Training and Public Awareness” of the NC5 contains limited or no information on training programmes and on the extent of the participation of public and non-governmental organizations in the preparation or domestic review of national communications. The ERT reiterates the recommendation of the ERT of the NC4 that the United Kingdom include such information in its next national communication.

130. The NC5 presents a variety of environmental education programmes in primary, secondary and higher education. The National Curriculum includes a number of

opportunities for young people to study sustainable development and climate change. The NC5 also presents training on the PRECIS modelling system of scientists from developing countries, in the United Kingdom, Belize, Malaysia, Ghana and Kenya. PRECIS is being used currently by a number of countries including Brazil, Egypt, Saudi Arabia and India and aims in assisting these countries to prepare their second national communication under the UNFCCC.

131. The NC5 demonstrated that the general public and business have access to the general information on climate change through a series of public information campaigns, such as: (a) Act on CO₂; (b) the Climate Change Communications Initiative (which ran until 2007); (c) a series of nine citizen forums in England, Wales and Northern Ireland (between January and March 2009); (d) the Climate Change Campaign run by the Welsh Assembly Government; and (e) the Carbon Trust's multi-media integrated One Million A Day campaign, which urged businesses to save energy, reduce carbon emissions and make significant direct costs savings.

132. The United Kingdom has established a number of resource and information centres. For example, the Learning and Teaching Scotland, which hosts a well-researched climate change resource for secondary schools; the Act on CO₂ advice line, website (including the Government Carbon Calculator, carbon efficiency ranking tool for vehicles), and the Nationwide Network of Regional Advice Centres, which provide consumers with advice on how to reduce their carbon footprints; Network of Energy Saving Scotland Advice Centres; and Energy Advice Service in Wales, which aims to deliver fuel poverty programmes.

133. The ERT noted that communication and stakeholder involvement is systematically organized by DECC. Non-governmental organizations were consulted in preparation of the LCTP. Defra developed an environmental segmentation model, used for advising policy and communications development. In addition, a web-based tool, designed to inform the public of which segment they best fit into and how they can make environmental changes, is under development.

134. The Devolved Administrations also support the involvement of the public. For example, the Welsh Assembly Government has actively supported research on climate change with significant capital investment in the Low Carbon Research Institute and the Bioscience and Environment Research Alliance and the Scottish Government provided a package of measures to help local authorities work towards a lower carbon school estate.

H. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

135. The United Kingdom has provided most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, which is placed in different sections of the NC5. Table 8 provides references to the NC5 chapters in which the supplementary information is provided.

136. The Party has not reported the description of the national registry, which is a mandatory element of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol. The ERT recommends that the United Kingdom include this reporting element in its next national communication.

Table 8

Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

<i>Supplementary information</i>	<i>Reference</i>
National system	NC5, annex E
National registry	Not provided in the NC5; included in the annual submission
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	NC5, chapter 3
Policies and measures in accordance with Article 2	NC5, chapters 3, 4 and 6
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC5, chapters 1 and 3
Information under Article 10	NC5, chapter 6
Financial resources	NC5, chapter 5

I. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

137. The United Kingdom reported the information requested in section H. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the annex to decision 15/CMP.1 as a part of its 2009 annual submission and elaborated this further in its 2010 annual submission. It has not reported, however, information on how it gives priority to the actions taken in implementing its commitments under Article 3, paragraph 14. During the in-country review, the United Kingdom provided the ERT with the additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be transparent and complete. The ERT commends the United Kingdom for the additional information provided and encourages it to continue exploring and further enhance reporting on the adverse impacts of the response measures.

138. The 2009 and 2010 annual submissions and the additional information provided during the review presented several initiatives of the United Kingdom aiming to minimize adverse impacts, including cooperating in the development of technologies, including CCS, assisting developing Parties that are highly dependent on the export of fossil fuels in diversifying their economies and conducting relevant research.

139. The United Kingdom cooperates with developing countries in the development and demonstration of CCS technologies. During the review the ERT was informed about a planned pilot CCS project in China within the framework of the EU Seventh Framework Programme. The EU has already allocated EUR 7 million for the investigation of CCS demonstration in China.

140. In the 2010 annual submission, the United Kingdom reported that the United Kingdom Foreign and Commonwealth Office has provided funding for several capacity-building projects that aim to assist developing country Parties that are highly dependent on

the export and consumption of fossil fuels in diversifying their economies. The United Kingdom supported renewable energy, energy efficiency projects in the Saudi Arabia and strengthened institutional capacity in South Africa and Kazakhstan through the development of climate change and energy related legislation. In addition, the United Kingdom informed the ERT about an example of minimisation of economic impact of CDM projects through development of standardized baselines for India's for small scale power grids projects.

141. Research projects have been carried out by the United Kingdom on the impact of the promotion of biofuels and on the impact of climate change mitigation policies. For example, the Gallagher Review¹² presents an assessment of the indirect effects of biofuels production and concludes that, inter alia, a slowdown in the growth of biofuels is needed until adequate controls to address displacement effects are implemented. The United Kingdom informed the ERT that in 2009 the rate of increase in the Renewable Transport Fuel Obligation has been slowed, shifting the target of 5 per cent by 2010–2011, as originally planned, to 2013–2014.

142. Another example is a study on the response measures of climate change mitigation policy action commissioned by DECC. The study focuses on the impact that climate change mitigation policies have on fossil fuel importing economies and economies reliant on tourism or food exports.¹³ DFID supported a study¹⁴ aiming to understand how possible mitigation measures (such as carbon taxes, EU ETS, border tax adjustments, CDM reform, carbon labelling, liberalization of trade in environmental goods and services, technology transfer mechanisms) undertaken by Parties included in Annex I to the Convention could affect the growth prospects of developing countries. In addition, the DFID launched an analysis of the industrial policy implications for South Africa of the emerging global transition to a low-carbon economy.¹⁵

III. Conclusions and recommendations

143. The ERT concludes that the NC5 provides a good overview of the national climate policy of the United Kingdom. The NC5 covers all the sections and contains information that meets most of the mandatory reporting requirements of the UNFCCC reporting guidelines and was submitted within the time frame set by decision 10/CP.13. The NC5 includes all reporting elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, with the exception of the description of the national registry. During the review the Party provided additional information on the national registry and explained the reasons why this information was not included in the NC5. The ERT acknowledges that the NC5 is concise and structured broadly following the outline contained in the UNFCCC reporting guidelines and the included supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is clearly identifiable.

144. The United Kingdom's GHG emissions decreased by 18.5 per cent in 1990–2008, mainly driven by: fuel switching from coal to gas; a decline in energy intensity arising from structural changes, increased utilization of nuclear power and measures to enhance energy efficiency; integrated pollution control measures in the industrial sector and

¹² Review of the Indirect Effects of Biofuels. 2008. Renewable Fuels Agency. Available at: <<http://www.renewablefuelsagency.gov.uk/reportsandpublications/reviewoftheindirecteffectsofbiofuels>>.

¹³ An assessment of the literature on the effects of climate change mitigation policies on non-Annex I countries, 2010. DECC.

¹⁴ Growth in a carbon constrained global economy, 2010. Overseas Development Institute.

¹⁵ Developing South Africa's Economic Policies for a low carbon world. 2010. Account Ability.

increased recovery of CH₄ from landfills. This trend is expected to continue in the future and is in accordance with the projections provided in the NC5.

145. The ‘with measures’ scenario indicates a continuous decrease of emissions until 2050. In 2010, GHG emissions are projected to be 25.3 per cent below the Kyoto base year level, implying that the United Kingdom can meet its target under the Kyoto Protocol (which is a 12.5 per cent reduction) for the first commitment period using domestic measures only. In 2020, GHG emissions are projected to be 37.4 per cent below 1990 level and thus to meet the national long-term target. These reductions are achieved through implementation of a comprehensive set of PaMs, which includes regulations, economic instruments, technology deployment and information measures and encompasses sectoral strategies, as well as PaMs at national and subnational/regional levels. The key PaMs include EU ETS, CCL, CCA and CRC. In 2020 the projected effects of these PaMs are significant, including those of the EU ETS (49.6 Tg CO₂ eq per year) and the effects of those from non-trading sectors (41.4 Tg CO₂ eq per year).

146. The NC5 contains implicit information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. The United Kingdom Government is not planning to make use of the Kyoto Protocol mechanisms to meet its first commitment period Kyoto target.

147. The United Kingdom has introduced the world’s first long-term legally binding framework to reduce GHG emissions and has set ambitious national mid- and long-term reduction targets and introduced a Low Carbon Transition Plan, a national strategy to enable the transition to low carbon economy in the United Kingdom, which is underpinned by comprehensive, well-designed policies and strategies to meet the objectives of the plan. The United Kingdom set legally binding limits known as “carbon budgets” on national GHG emissions, for three periods of five years and is legally bound to cut emissions by 34 per cent by 2020 and at least 80 per cent by 2050 below 1990 levels. Meeting these targets and carbon budgets, though, might be challenging in the face of current economic problems, funding uncertainty, and the rate of new low-carbon technology penetration.

148. The United Kingdom is among the largest providers of financial resources on climate change to developing countries. The contributions of the Party has increased over the period 2006–2009, including by providing financial resources which were considered by the United Kingdom as “new and additional” pursuant to Article 4, paragraph 3, of the Convention. Technology transfer is provided mainly through its bilateral and multilateral activities, including transfer of technology under Article 10 of the Kyoto Protocol. The United Kingdom promotes developing countries’ access to financing for clean technologies by undertaking or participating in various initiatives, such as the Renewable Energy and Energy Efficiency Partnership.

149. ERT considers that the United Kingdom has demonstrated advanced efforts, and has a solid institutional set-up and regulatory framework to address vulnerability and adaptation at domestic and international levels, with a focus on adaptation. It has also demonstrated its support to a wide range of initiatives on adaptation, including capacity-building activities, in developing countries, especially those that are particularly vulnerable to the adverse effects of climate change.

150. The United Kingdom is among the leading countries in the area of research and systematic observation on climate change and advanced technologies, supporting a broad range of relevant capacity-building activities in developing countries. It also demonstrated that solid attention is given to education and public awareness on climate change at national and subnational levels and to training aimed at building capacity in the developing countries.

151. The ERT concluded that the United Kingdom national system continues to perform its required functions as set out in decision 19/CMP.1; that the national registry continues to perform the functions set out in decisions 5/CMP.1 and 13/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions. The ERT noted that updates of databases and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible persons.

152. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol provided by the Party in its 2009 and 2010 annual submissions is complete and transparent. The ERT encourages the United Kingdom to further enhance the reporting on Article 3, paragraph 14, including by indicating the prioritization of the action taken in implementing its commitments under Article 3, paragraph 1.

153. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of the United Kingdom's reporting under the Convention and its Kyoto Protocol. The key recommendations¹⁶ are that the United Kingdom:

(a) Improve completeness of reporting by including in the next national communication the following information:

- (i) Description of and/or a reference to how its national registry performs its functions;
- (ii) Complete information on characteristics of PaMs, including types of PaMs and implementing entities;
- (iii) Information on the total effect of adopted and implemented PaMs;
- (iv) Projections related to fuel sold to ships and aircraft engaged in international transport;
- (v) Complete information on financial contributions to bilateral and regional financial contributions;
- (vi) Information on success and failure stories related to technology transfer.

(b) Improve the transparency of reporting by:

- (i) Reflecting all chapters of the national communication in the executive summary and providing complete CRF summary tables;
- (ii) Providing sector-specific information on factors and activities underpinning historic and projected emission trends between 1990 and 2020;
- (iii) Reporting on distinguishing between activities undertaken by the public and those undertaken by the private sector with regard to promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies.

IV. Questions of implementation

154. During the review the ERT assessed the NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the

¹⁶ The recommendations are given in full in the relevant sections of this report.

Kyoto Protocol, with regard to timeliness, completeness and transparency. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

FCCC/SBI/2007/INF.6. Compilation and synthesis of fourth national communications. Available at <<http://unfccc.int/resource/docs/2007/sbi/eng/inf06.pdf>>.

FCCC/SBI/2007/INF.6/Add.1. Compilation and synthesis of NC4s, Add.1: Policies, measures, past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <<http://unfccc.int/resource/docs/2007/sbi/eng/inf06a01.pdf>>.

FCCC/SBI/2007/INF.6/Add.2. Compilation and synthesis of NC4s, Add.2: Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <<http://unfccc.int/resource/docs/2007/sbi/eng/inf06a02.pdf>>.

FCCC/ARR/2009/GBR. Report of the individual review of annual submission of the United Kingdom of Great Britain and Northern Ireland submitted in 2009. Available at <<http://unfccc.int/resource/docs/2010/arr/gbr.pdf>>.

FCCC/IRR/2007/GBR. Report of the review of the initial report of the United Kingdom of Great Britain and Northern Ireland. Available at <<http://unfccc.int/resource/docs/2007/irr/gbr.pdf>>.

FCCC/IDR.4/GBR. Report of the centralized in-depth review of the fourth national communication of the United Kingdom of Great Britain and Northern Ireland. Available at <<http://unfccc.int/resource/docs/2007/idr/gbr04.pdf>>.

Fourth national communication of the United Kingdom of Great Britain and Northern Ireland. Available at <<http://unfccc.int/resource/docs/natc/uknc4.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 preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories”. FCCC/CP/1999/7. Available at <<http://unfccc.int/resource/docs/cop5/07.pdf>>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Decision 15/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Decision 22/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>>.

2009 greenhouse gas inventory submission of the United Kingdom of Great Britain and Northern Ireland. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php>.

2010 greenhouse gas inventory submission of the United Kingdom of Great Britain and Northern Ireland. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

B. Additional information provided by the Party¹

Responses to questions during the review were received from Dr. Alison Stirling, Mr. Alon Carmel, Ms. Helen Champion, Mr. Graeme Childe, Ms. Jolene Cook, Ms. Yamide Dagnet, Ms. Alexia Davison, Mr. Luke Davison, Mr. Ray Eaton, Mr. Simon Francis, Mr. Alasdair Grainger, Mr. James Harries, Ms. Wendy Hartnell, Ms. Kate Hughes, Mr. James Hughes, Mr. Kevin Hunt, Ms. Sarah Johnson, Ms. Cathy Johnson, Ms. Ewa Kmietowicz, Ms. Gill Longman, Mr. John Mackintosh, Ms. Margaret Maier, Mr. Jeremy Martin, Mr. Paul McCloghrie, Ms. Sarah Millar, Mr. Gregor McKirdy, Ms. Bronwen Northmore, Ms. Stephanie Ockenden, Mr. David O’Gorman, Ms. Marie Pender, Mr. Jim Penman, Mr. Kieran Power, Mr. Trevor Raggatt, Mr. Alistair Rennie, Ms. Sarah Resouly, Mr. Paul Rochester, Ms. Fiona Samson, Mr. Chris Sear, Mr. Peter Serjent, Mr. Valsa Shah, Ms. Anastasia Theodorou, Ms. Katharine Thoday, Mr. Sam Thomas, Ms. Kate Ward, Ms. Julie Whiting, Mr. Aram Wood, Ms. Kim Worts, Mr. Richard Vianello (Department of Energy and Climate Change (DECC)), Ms. Katherine Bass, Mr. Mark Broadmeadow, Mr. John Conway, Mr. Graham Clough, Mr. Simon Dawes, Mr. Dan Firth, Mr. Luke Jessop, Mr. Daniel Jones, Ms. Claire Lewis, Ms. Joanna Long, Ms. Kathryn Morley, Ms. Kathryn Packer, Mr. Bob Ryder, Ms. Maria Suttle, Ms. Julie Whiting, (Department for Environment, Food, and Rural Affairs (Defra)), Ms. Sarah Choudrie, Ms. Joanna Jackson, Mr. John Watterson (AEA Technology), Mr. Phil Brookfield, Mr. Kevin Williams (Environment Agency), Ms. Kat Deyes, Mr. Rupert Furness, Mr. Derek Howard (Department for Transport (DfT)), Mr. Christopher Bestwick (Department for Children Schools and Families (DCSF)), Ms. Nicolette Bartlett, Ms. Claire Brialey, Mr. Graham Davis, Mr. Paul Decort, Ms. Hannah Jane McNamara, Ms. Rosie Smith (Communities and Local Government (CLG)), Ms. Jane Clark, Ms. Alice Kehoe, Mr. Phil Lewis, Mr. Malcolm Smart (Department for International Development (DfID)), Mr. Tom Cummins, Mr. Ben Llewellyn-Jones, Mr. Tom Phipps (Foreign and Commonwealth Office (FCO)), Ms. Rhian Kelly (Confederation of British Industry (CBI)), Ms. Ruth Davis (Greenpeace), Mr. Philip Denley (Department for Children Schools and Families (DCSF)), Ms. Alison Doig (Climate Change, Christian Aid), Mr. Brendan Forde (Climate Change Unit, Department Of Energy, Northern Ireland), Mr. David Kennedy (Committee on Climate Change), Ms. Sara Shaw (Climate Change Policy Officer, Tearfund), Mr. Jonathan Stearn (Disadvantage Team, Consumer focus), Mr. David Vincent (Carbon Trust), Mr. Philip Wright (Climate Change, Scottish Government), including additional material on updated policies and measures, GHG projections, the national registry and recent climate policy developments in the United Kingdom of Great Britain and Northern Ireland.¹

The following documents were also provided by the United Kingdom of Great Britain and Northern Ireland:

Archer G, Berry A, Gallagher E, Henderson A, Malins C, McDougall S and Rose L. July 2008. *The Gallagher Review of the indirect effects of biofuels production*. St Leonards-on-Sea, East Sussex. Renewable Fuels Agency. St Leonards-on-Sea, East Sussex. Available at: <<http://www.renewablefuelsagency.gov.uk/reportsandpublications/reviewoftheindirecteffectsofbiofuels>>.

Bhardwaj N, Green J, Subbarao S, Vrolijk C. 2006. *Clean Development Mechanism Baseline for Indian Grid Connected Projects*. Chineham, Hampshire. Foreign and Commonwealth Office projects. Available at <www.cdmbaselineindia.org>.

Cardenas L, Choudrie S, Jackson J, Leech A, Mobbs D, Murrells T, Passant N, Thistlethwaite G, Thomson A, Watterson J. April 2009. *UK Greenhouse Gas Inventory*

¹ Reproduced as received from the Party.

1990 to 2007: Annual Report for submission under the Framework Convention on Climate Change. This work forms part of the Climate and Energy: Science and Analysis Research Programme of the Department of Energy and Climate Change. London. Available at: <http://www.airquality.co.uk/reports/cat07/0905131425_ukghgi-90-07_main_chapters_Issue2_UNFCCC_CA_v5_Final.pdf>.

Committee on Climate Change. December 2008. *Building a low-carbon economy – the UK's contribution to tackling climate change*. The Stationary Office. Available at <<http://www.theccc.org.uk/reports/building-a-low-carbon-economy>>.

Committee on Climate Change. October 2009. *Meeting Carbon Budgets – the need for a step change: Progress Report to Parliament*. Seacourt. Available at <<http://www.theccc.org.uk/reports/progress-reports>>.

Committee on Climate Change. December 2009. *Meeting the UK Aviation target – options for reducing emissions to 2050*. Seacourt. Available at <<http://www.theccc.org.uk/reports/aviation-report>>.

Defra Adaptation. *Adapting your procurement*. Office of Government Commerce. Available at <www.defra.gov.uk/environment/climate/programme/government-systems.htm#procurement>.

Department of Energy and Climate Change. April 2009. *Impact Assessment of EU Climate and Energy package, the revised EU Emissions Trading System Directive and meeting the UK non-traded target through UK carbon budgets*. Available at <http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_budgets/carbon_budgets.aspx>.

Department of Energy and Climate Change. April 2009. *Energy and emissions projections*. London. Available at: <<http://www.decc.gov.uk/en/content/cms/statistics/projections/projections.aspx>>.

Department of Energy and Climate Change. July 2009. *Carbon valuation in UK policy appraisal: A revised approach*. Available at <http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx>.

Department of Energy and Climate Change. July 2009. *Departmental Carbon Budgets*. London. Available at <http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_budgets/departments/departments.aspx>.

Department of Energy and Climate Change. 2009. *UK carbon budgets: Accounting for non-transport policy impact on UK energy demand, UK emissions and UK net emissions*. Internal document.

Department for Environment, Food and Rural Affairs. March 2010. *Defra's Climate Change Plan 2010*. London. Available at: <<http://www.defra.gov.uk/environment/climate/documents/climate-change-plan-2010.pdf>>.

Department for Environment Food and Rural Affairs. March 2010. *Natural Environment Adapting to Climate Change*. London. Available at <<http://www.defra.gov.uk/environment/climate/documents/natural-environment-adaptation.pdf>>.

Department for Transport. July 2009. *Low Carbon Transport: A Greener Future*. The Stationary Office Limited. Available at <<http://www.dft.gov.uk/pgr/sustainable/carbonreduction/>>.

Department for Transport. July 2009. *Impact Assessment of the Carbon Reduction Strategy for Transport, Low Carbon Transport: A Greener Future*. Available at <<http://www.dft.gov.uk/pgr/sustainable/carbonreduction/>>.

Elliot Morley. Office of Public Sector Information. October 2005. *The Greenhouse Gas Emissions Trading Scheme (Amendment) and National Emissions Inventory Regulations 2005*. The Stationery Office Limited. Available at <<http://www.opsi.gov.uk/si/si2005/20052903.htm>>.

Energy Technologies Institute. 2009. *UK Low Carbon Energy Technology–Defining a Roadmap to 2050*. Available at <<http://www.energytechnologies.co.uk/Uploads/RelatedDocsThumbnails/brochure-and-inserts-march-2010.pdf>>.

HM Government. *Adaptation across Government*. July 2008. Department for Environment, Food and Rural Affairs. Available at <<http://www.defra.gov.uk/environment/climate/programme/across-government.htm>>.

HM Government. July 2009. *The UK Low Carbon Transition Plan: National Strategy for Climate & Energy*. The Stationary Office Limited. Available at <http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx>.

HM Government. July 2009. *Analytical Annex: The UK Low Carbon Transition Plan*. The Stationary Office Limited. Available at <http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx>.

HM Government. July 2009. *UK Low Carbon Transition Plan emission projections*. The Stationary Office Limited. Available at <http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx>.

HM Government. July 2009. *The UK Renewable Energy Strategy*. The Stationary Office Limited. Available at <http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx>.

HM Government. January 2010. *Valuation of energy use and greenhouse gas emissions for appraisal and evaluation*. Department of Energy and Climate Change: London. Available at <http://www.decc.gov.uk/en/content/cms/statistics/analysts_group/analysts_group.aspx>.

HM Government. March 2010. *Warm Homes, Greener Homes: A Strategy for Household Energy Management*. Available at <http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/saving_energy/hem/hem.aspx>.

HM Government. March 2010. *Climate Change: Taking Action – Delivering the Low Carbon Transition Plan and Preparing for a Changing Climate*. London. Available at <<http://www.defra.gov.uk/environment/climate/documents/taking-action.pdf>>.

Jackson J. and Watterson J. December 2008. *UK emissions of HFCs, PFCs and SF6 –2008 update*. AEA Technology plc: Oxfordshire.
