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**Report of the individual review of the greenhouse gas inventories of the  
United Kingdom of Great Britain and Northern Ireland  
submitted in 2007 and 2008\***

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\* In the symbol for this document, 2008 refers to the year in which the inventory was submitted, and not to the year of publication.

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## I. Overview

### A. Introduction

1. This report covers the centralized review of the 2007 and 2008 greenhouse gas (GHG) inventory submissions of the United Kingdom of Great Britain and Northern Ireland, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. In accordance with the conclusions of the Subsidiary Body for Implementation at its twenty-seventh session,<sup>1</sup> the focus of the review is on the most recent (2008) submission. The review took place from 15 to 20 September 2008 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. William Agyemang-Bonsu (Ghana) and Mr. Vlad Trusca (Romania); energy – Ms. Branca Americano (Brazil), Mr. Frank Neitzert (Canada) and Mr. Matej Gasperic (Slovenia); industrial processes – Mr. Jos Olivier (Netherlands) and Mr. Teemu Oinonen (Finland); agriculture – Ms. Penny Reyenga (Australia) and Mr. Washington Zhakata (Zimbabwe); land use, land-use change and forestry (LULUCF) – Mr. Xiaoquan Zhang (China) and Mr. Aleksi Lehtonen (Finland); and waste – Ms. Kyoko Miwa (Japan) and Mr. Eduardo Calvo (Peru). Ms. Americano and Ms. Reyenga were the lead reviewers. The review was coordinated by Mr. Tomoyuki Aizawa and Mr. Matthew Dudley (UNFCCC secretariat).

2. In accordance with the “Guidelines for review under Article 8 of the Kyoto Protocol” (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, into this final version of the report.

### B. Inventory submission and other sources of information

3. The 2008 inventory was submitted on 15 April 2008; it contains a complete set of common reporting format (CRF) tables for the period 1990–2006 and a national inventory report (NIR). This is in line with decision 15/CMP.1. The Party indicated that the 2008 submission is also its voluntary submission under the Kyoto Protocol.<sup>2</sup> In its 2007 submission, which was submitted on 13 April 2007, the United Kingdom included a complete set of CRF tables for the period 1990–2005 and an NIR. Where needed, the expert review team (ERT) also used previous years’ submissions, additional information provided during the review and other information. The full list of materials used during the review is provided in the annex to this report.

### C. Emission profiles and trends

4. In 2006 (as reported in the 2008 inventory submission), the main GHG in the United Kingdom was carbon dioxide (CO<sub>2</sub>), accounting for 85.1 per cent of total GHG emissions<sup>3</sup> expressed in CO<sub>2</sub> eq, followed by methane (CH<sub>4</sub>) (7.5 per cent) and nitrous oxide (N<sub>2</sub>O) (5.8 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>) collectively accounted for 1.6 per cent of the overall GHG emissions in the country. The energy sector accounted for 85.8 per cent of the total GHG emissions, followed by agriculture (6.7 per cent), industrial processes (4.1 per cent) and waste (3.4 per cent). In 2006, total GHG emissions amounted to 655,786.73 Gg CO<sub>2</sub> eq and decreased by 15.4 per cent between the base year<sup>4</sup> and 2006. In 2005 (as reported in the 2007 inventory submission), total GHG emissions amounted to 657,395.80 Gg CO<sub>2</sub> eq. The shares of gases and sectors in 2006 (2008 inventory submission) were similar to those in 2005 (2007 inventory submission).

<sup>1</sup> FCCC/SBI/2007/34, paragraph 104.

<sup>2</sup> Parties may start reporting information under Article 7, paragraph 1, of the Kyoto Protocol from the year following the submission of the initial report, on a voluntary basis (decision 15/CMP.1).

<sup>3</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified.

<sup>4</sup> “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

The United Kingdom has reported considerable reductions in GHG emissions for the period 1990–2006, especially for PFCs (78.9 per cent), CH<sub>4</sub> (52.5 per cent) and N<sub>2</sub>O (40.0 per cent). The sectors with the greatest reductions in emissions over this period were: waste (58.4 per cent), industrial processes (50.3 per cent) and agriculture (18.1 per cent).

5. Tables 1 and 2 show GHG emissions by gas and by sector, respectively.

#### **D. Key categories**

6. The United Kingdom has reported a tier 2 key category analysis, both level and trend assessment, as part of its 2008 submission. The United Kingdom prepared the key categories analysis both including and excluding the LULUCF sector, as recommended by the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). The key category analyses performed by the United Kingdom and by the secretariat<sup>5</sup> produced different results because, while the United Kingdom carried out a tier 2 analysis, the secretariat carried out a tier 1 analysis, which generally identifies fewer key categories than recommended in the IPCC good practice guidance. The same approach was used in the 2007 submission and similar key categories were identified. However, in the 2007 submission, the United Kingdom has provided the key categories analysis only for 2005, and not for 1990, which is not in accordance with 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” (hereinafter referred to as the UNFCCC reporting guidelines). The ERT noted that the key category analysis in the 2008 submission is an improvement upon that in the 2007 submission, which was called “key source analysis”, in that the United Kingdom has reported both level and trend assessments for 1990 and 2006, both excluding and including the LULUCF sector.

#### **E. Main findings**

7. The inventories are generally in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The 2008 inventory submission is of a high quality and shows improvement with regard to most of the issues identified in previous reviews. The NIR has been prepared in accordance with the structure outlined in the UNFCCC reporting guidelines and provides sufficient information, complete with references, on the national system, key categories, uncertainty analysis, recalculations, activity data (AD) and methodologies used to estimate emissions. The ERT encourages the United Kingdom to provide more information in the NIR on quality assurance procedures and the external review of the inventory.

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<sup>5</sup> The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance for LULUCF. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. Where the Party performed a key category analysis, the key categories presented in this report follow the Party’s analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

**Table 1. Greenhouse gas emissions by gas, 1990–2006**

Greenhouse gas	Gg CO <sub>2</sub> eq								Change base year–2006 (%)
	Base year <sup>a</sup>	1990	1995	2000	2003	2004	2005	2006	
CO <sub>2</sub>	590 631.25	590 631.25	549 856.88	550 254.83	557 184.79	558 293.08	558 618.07	557 855.40	–5.5
CH <sub>4</sub>	103 671.96	103 671.96	90 279.82	68 513.90	53 541.50	51 683.23	49 727.05	49 219.15	–52.5
N <sub>2</sub> O	63 868.71	63 868.71	53 045.83	43 601.85	39 829.48	40 617.47	39 816.76	38 338.26	–40.0
HFCs	15 502.47	11 375.39	15 502.47	9 120.34	10 259.70	8 950.40	9 224.20	9 199.35	–40.7
PFCs	470.84	1 401.57	470.84	485.04	264.00	331.48	251.00	296.21	–37.1
SF <sub>6</sub>	1 239.30	1 029.95	1 239.30	1 798.41	1 324.08	1 128.32	1 095.61	878.35	–29.1

<sup>a</sup> “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

**Table 2. Greenhouse gas emissions by sector, 1990–2006**

Sector	Gg CO <sub>2</sub> eq								Change base year–2006 (%)
	Base year <sup>a</sup>	1990	1995	2000	2003	2004	2005	2006	
Energy	611 191.13	611 191.13	565 311.57	559 866.89	564 565.97	565 049.55	564 379.91	562 860.98	–7.9
Industrial processes	57 354.62	53 948.92	46 389.42	31 246.76	27 912.78	27 651.84	27 219.94	26 801.31	–53.3
Solvent and other product use	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	NA
Agriculture	53 890.00	53 890.00	51 719.99	49 171.34	45 995.53	45 922.52	45 083.06	44 117.15	–18.1
LULUCF	NA	2 924.20	1 206.50	–402.13	–1 117.20	–1 874.88	–2 029.09	–1 961.66	NA
Waste	52 948.78	52 948.78	46 974.16	33 489.37	23 929.28	22 380.08	22 049.78	22 007.29	–58.4
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total (with LULUCF)</b>	NA	774 903.03	711 601.64	673 372.23	661 286.35	659 129.11	656 703.60	653 825.07	NA
<b>Total (without LULUCF)</b>	775 384.53	771 978.83	710 395.14	673 774.36	662 403.55	661 003.99	658 732.69	655 786.73	–15.4

*Abbreviations:* LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated, NO = not occurring, IE = included elsewhere.

<sup>a</sup> “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

8. The United Kingdom has provided limited information on the general GHG emission trends in chapter 2 of the NIR and an insufficient trend analysis at the sectoral level. However, the Party has provided in annex 6 to the NIR detailed information on the trend analysis by sector and by category. The ERT recommends that the United Kingdom present in detail in the appropriate chapter of the NIR the general trend analysis for overall GHG emissions (including explanations for variations in the trends by gas and by sector).

9. In general, the 2008 submission is an improvement upon the 2007 submission. The United Kingdom has taken into consideration the recommendations made in the initial review under the Kyoto Protocol that became available after the 2007 inventory had been submitted. No major inconsistencies were identified by the ERT between the data provided in the NIR and the information included in CRF summary table 3. However, several minor inconsistencies were identified, especially under the agriculture sector. The ERT encourages the Party to address these inconsistencies in its next submission.

10. Throughout the review week, the United Kingdom provided prompt and detailed answers to questions raised by the ERT. The ERT commends the United Kingdom for facilitating the review process in this way.

## **F. Cross-cutting issues**

### **1. Completeness**

11. The 2008 inventory submission covers all years from 1990 to 2006 and is generally complete in terms of source/sink categories, direct and indirect GHGs and sulphur dioxide (SO<sub>2</sub>), and geographical coverage. However, several categories, mostly in the LULUCF and energy sectors, have not been estimated and insufficient information has been provided in CRF table 9(a) and annex 5 to the NIR. The ERT encourages the United Kingdom to estimate and report in its next annual submission the emissions from categories currently reported as not estimated (“NE”), giving priority to the largest sources.

12. The United Kingdom has provided a complete set of CRF tables for the period 1990–2006, including the LULUCF reporting tables as required by decision 14/CP.11, and a comprehensive and complete NIR. However, CRF table 9 has not been filled in. For the LULUCF sector, in many cells emissions have been reported as included elsewhere (“IE”), but this has not been very clearly explained in the documentation boxes. The ERT strongly recommends that the United Kingdom provide complete information on the categories reported as “IE” in both the CRF and the NIR in its next annual submission.

### **2. Transparency**

13. The United Kingdom’s inventories (CRF and NIR) are generally transparent in the general introductory section (e.g. description of national system, key category analysis, uncertainty analysis, quality assurance and quality control (QA/QC) activities and recalculations) and in the sectoral chapters (e.g. AD providers, rationale for selection of emission factors (EFs) and methods, references for methods and EFs, and assumptions made on the basis of expert judgement). This facilitated the full assessment of the inventories. In order to improve the transparency of its inventory in response to recommendations made by previous ERTs, the United Kingdom has provided more information in its 2008 submission than was provided in its 2006 and 2007 submissions. However, the transparency of the inventory could be further improved by enhancing the explanation and justification for the allocation of AD and the adoption of new EFs, particularly where these do not result in a recalculation of the entire time series.

### 3. Recalculations and time-series consistency

14. The ERT noted that recalculations reported by the United Kingdom of the time series 1990–2005 have been undertaken to take into account the recommendations from previous reviews and improve the overall quality of the inventory. The United Kingdom has provided in CRF tables 8(a) and 8(b) and in chapter 10 of the NIR of its 2008 submission sufficient information on the recalculations and improvements performed since the 2006 and 2007 submissions. The NIR also contains an evaluation of the implications of these recalculations for emission trends and a list of improvements performed, as requested in previous reviews. The effect of the recalculations on the estimated emissions for the base year (as reported in the CRF tables) was an increase of 563.64 Gg CO<sub>2</sub> eq, or 0.07 per cent of total GHG emissions excluding LULUCF.

### 4. Uncertainties

15. In accordance with the UNFCCC reporting guidelines, the United Kingdom has provided an uncertainty analysis for each source category and for the inventory as a whole, using the tier 1 (error propagation) and tier 2 (Monte Carlo analysis) methods described in the IPCC good practice guidance, as well as a comparison of the uncertainties estimated using each approach. As requested during previous reviews, the Party has provided more information on its uncertainty analysis, including quantitative results and a qualitative discussion of the sources of the uncertainties, in the sectoral chapters of the NIR. The Monte Carlo analysis method has been revised since the last submission, having conducted a major review in collaboration with the country's LULUCF experts of the correlations used by the United Kingdom's inventory agency. Improving the uncertainty analysis in the 2008 submission has brought about a reduction in uncertainties compared with the 2007 submission. The United Kingdom uses its uncertainty analysis in the key category analysis to prioritize improvements to the inventory.

### 5. Verification and quality assurance/quality control approaches

16. In accordance with the UNFCCC reporting guidelines, the United Kingdom has established a QA/QC system based on the tier 1 method given in the IPCC good practice guidance and is planning to improve this system to comply with the tier 2 method. The Party has provided detailed information on its QA/QC procedures, on QC activities in particular, and on the implementation of its QA/QC plan, including verification procedures and handling issues of confidentiality. The ERT encourages the United Kingdom to provide more information on its QA activities in the NIR of its next annual submission.

### 6. Follow-up to previous reviews

17. Most of the improvements made to the inventory resulting from recommendations made during previous reviews have been explained in the NIR. As a follow-up to the last review in March 2007, the Party has made several improvements to the cross-cutting areas of the inventory (e.g. provided more information on the national system; added a table containing recalculations of the base year estimates; improved the transparency of the uncertainties; improved the key category analysis and added the base year key category analysis; improved consistency between the CRF and the NIR; and provided reasons for recalculations in the CRF tables 8(b)). Several improvements have been implemented in the sectoral chapters, taking into account the recommendations from previous reviews.

18. However, the ERT noted that several recommendations from previous reviews have not yet been implemented. These recommendations include the reporting of fluorinated gas (F-gas) emissions by species and the estimation of CH<sub>4</sub> and N<sub>2</sub>O emissions from industrial wastewater. During the review, the United Kingdom informed the ERT that work has been commissioned to enable speciation of the F-gas estimates, but noted that speciation in some subsectors will be difficult owing to issues of commercial confidentiality. In addition, the ERT was informed that the data and methods for estimating emissions from industrial wastewater were being reviewed.



## **G. Areas for further improvement**

### **1. Identified by the Party**

19. The 2008 NIR identifies several general areas for improvement, including improvements required internally and those recommended in previous reviews. The United Kingdom has indicated planned improvements to most of the categories detailed in the NIR and also regarding the legal and procedural frameworks of the national system.

### **2. Identified by the expert review team**

20. The ERT identifies the following cross-cutting issues for improvement:

- (a) Information on the QA procedures and the external review of the inventory should be more detailed in the NIR;
- (b) The general trend analysis for the overall GHG emissions should be presented in detail in the relevant chapter of the NIR;
- (c) The consistency between the NIR and the CRF should be further improved.

21. Recommended improvements relating to specific source/sink categories are presented in the relevant sector chapters of this report.

## **II. Energy**

### **A. Sector overview**

22. In 2006, the energy sector accounted for 562,860.98 Gg CO<sub>2</sub> eq, or 85.8 per cent of total GHG emissions. Emissions from the sector decreased by 7.9 per cent between 1990 and 2006. The key driver for the fall in emissions is the decline in emissions from the energy industries, manufacturing industries and construction, and fugitive emissions from fuels. Over the period 1990–2006 the only energy subsector to experience an increase in emissions was transportation (by 15.0 per cent). Within the sector, 38.8 per cent of the emissions were from energy industries, followed by 24.3 per cent from transport, 19.0 per cent from other sectors and 14.9 per cent from manufacturing industries and construction. Oil and natural gas accounted for 1.8 per cent and solid fuels accounted for 0.7 per cent.

23. With regard to its coverage of the energy sector, the submission is largely complete, providing emission estimates for all major sources and gases. Emissions from multilateral operations, CH<sub>4</sub> and N<sub>2</sub>O from lubricants, and fugitive CO<sub>2</sub> emissions from natural gas distribution have been reported as “NE”.

24. In the 2007 and 2008 submissions, recalculations of the emissions from the energy sector for 1990 resulted in an overall decrease in the reported emissions of 159.90 Gg CO<sub>2</sub> eq, or 0.03 per cent. The largest changes to emission estimates were made in the categories of transport (–0.5 per cent) and manufacturing industries and construction (–1.8 per cent). The recalculations for 2004 resulted in an overall decrease in the reported emissions of 4,563.89 Gg CO<sub>2</sub> eq, or 0.8 per cent. The recalculations for 2005 resulted in an overall increase in reported emissions of 995.83 Gg CO<sub>2</sub> eq, or 0.2 per cent.

### **B. Reference and sectoral approaches**

#### **1. Comparison of the reference approach with the sectoral approach and international statistics**

25. The United Kingdom has calculated CO<sub>2</sub> emissions from fossil fuel combustion using the reference and sectoral approaches for all years of the time series. For 2006, the estimate of CO<sub>2</sub> emissions calculated using the reference approach is 2.4 per cent lower than that estimated using the

sectoral approach. The differences between the two approaches vary across the time series from more than 3 per cent in 1995 to less than 1 per cent in 1991, with the exception of 1990, for which the estimate of emissions calculated using the sectoral approach is 0.6 per cent higher than that estimated using the reference approach. The differences have been described in the NIR; they are caused by the use of different independent data sources for the two approaches and are within the range of what might be expected, since some sources, such as waste incineration, non-fuel industrial processes, and offshore flaring and well testing, are not included in the reference approach. However, the ERT recommends that the United Kingdom add those sources not accounted for to the appropriate category of the reference approach (e.g. other liquid/solid/gaseous fuels) in order to further reduce the differences between the emission estimates calculated using the two approaches and to verify whether those sources cause the bulk of the difference.

## 2. International bunker fuels

26. The ERT was informed that the United Kingdom uses fuel consumption data which is provided by the United Kingdom's Department for Business, Enterprise and Regulatory Reform (DBERR) and published in the Digest of United Kingdom Energy Statistics (DUKES) to estimate emissions from international marine and domestic navigation, and that the figure for total jet kerosene consumption used in the inventory (the sum of international and domestic consumption) is cross-checked with the data presented in DUKES.

27. There is a difference between the AD reported in the United Kingdom's CRF and those reported by the International Energy Agency (IEA), resulting from their use of mismatched sources of data for the domestic/international split of the fuel used in aviation. The explanation provided by the United Kingdom is that the IEA uses data provided by the DBERR in the Monthly Oil Statistics (MOS) and Annual Oil Questionnaire (AOQ) for its emission calculations. The MOS/AOQ also include unpublished data on the domestic/international split of the fuel used in aviation based on collated company data. The DBERR has expressed its concern about the quality of these data because it is unclear how oil companies record eventual usage after sale. However, the United Kingdom has not clarified how it intends to deal with this discrepancy, simply stating that it is using the IPCC tier 3 approach to estimate these fuel consumptions.

28. The ERT encourages the United Kingdom to provide clarification on the issues that generate this discrepancy and try to ensure that information provided to the IEA is compatible with that provided to the UNFCCC.

## 3. Feedstocks and non-energy use of fuels

29. According to the NIR, natural gas is used as a feedstock for the manufacture of ammonia (NH<sub>3</sub>), methanol and acetic acid. In order to improve transparency, the ERT recommends that the United Kingdom provide detailed background information in the NIR, together with a full description of the fractions of carbon stored for the fuels listed in CRF table 1.A(d). The ERT also encourages the United Kingdom to assess whether the default values for the fractions of carbon stored correspond to its national circumstances, given the significant differences in apparent energy consumption and estimated CO<sub>2</sub> emissions calculated using the sectoral and reference approaches.

## 4. Country-specific issues

30. As identified during the previous review, there are a number of instances where there are relatively large inter-annual changes in the implied emission factors (IEFs). These inter-annual changes are caused by the use of annually agreed carbon content factors published in the Carbon Emission Factor Review. The purpose of using these annual values is to take trends in fuel quality into account. According to the NIR, the United Kingdom considered an approach for removing the inter-annual

variability, as suggested by the previous review team, but determined that the use of these annual carbon emission factors provides the most accurate estimate of emissions in a given year.

### **C. Key categories**

#### **1. Stationary combustion: all fuels – CO<sub>2</sub>**

31. The ERT noted that the estimated emissions from power stations increased by 2,206 Gg CO<sub>2</sub> with recalculations for 2005 between submitted in 2007 and in 2008 owing to the reallocation of coal from combustion in other industries to power stations. During the review, the United Kingdom confirmed that it has reallocated 959 kt of coal (which represents 53 per cent of total coal consumption in the manufacturing industries and construction category). The Party explained that this alteration was made owing to the removal of an adjustment that the inventory compilers had introduced for the 2004 GHG inventory. At that time, as reflected in the 2006 submission, the United Kingdom had introduced an adjustment to reconcile the data in DUKES and its GHG inventory with coal consumption data from the British Cement Association. This is because in 2004 the estimates in DUKES of the coal consumption of power stations were too high and the estimates of the coal consumption of the cement industry were too low. Therefore, a transfer of a proportion of the coal consumed was made between the two source categories, following discussions with the Association of United Kingdom Electricity Producers. The DBERR has subsequently revised DUKES, so the adjustment was no longer necessary. However, the inventory compilers did not remove the adjustment until the 2008 submission.

32. The ERT recommends that the United Kingdom compare the facility-level AD used for the inventory with the AD derived from reports verified by the European Union emissions trading scheme (EU ETS) together with AD received from facilities temporarily excluded from emissions trading. The ERT also recommends that the United Kingdom address any discrepancies found through this comparison and provide detailed background information on the reallocation issue referred to in paragraph 31 above in its next annual submission. In response to the draft report, the United Kingdom informed the ERT that an analysis of the available data from the EU ETS for 2005–2007 had been conducted and that the findings (and impacts upon the United Kingdom's GHG inventory) would be discussed in the NIR of its 2009 submission.

33. The CO<sub>2</sub> IEFs for other fuels in the public electricity and heat production sector for 1990 (169.19 t/TJ) and 1991 (172.28 t/TJ) have been identified as outliers and are the highest of the reporting Parties for these years (ranging from 23.90 t/TJ to 172.28 t/TJ). The value for 2006 is 66.0 per cent lower than the value for 1990 and all inter-annual changes have been identified as outliers. During the review, the United Kingdom explained that the inter-annual changes in IEFs are caused in part by the episodic burning of scrap tyres. The emissions from the United Kingdom's Overseas Territories (OTs) and Crown Dependencies (CDs) are also included in the category other fuels. All the fuels used in public electricity and heat production are included for the OTs, but only municipal solid waste (MSW) is included for the CDs. This is because the solid, liquid and gaseous fuels for the CDs are included under their respective fuel categories in the public electricity and heat production. The ERT recommends that the United Kingdom include this explanation in the NIR along with information on the CO<sub>2</sub> EF for MSW and the disaggregated fuel consumption data for OTs (all fuels), CDs (MSW) and scrap tyres. In response to the draft report, the United Kingdom informed the ERT that, in its next annual submission, emissions from the fuel used in the OTs would be reported under the categories in which the fuel is used.

34. With regard to CO<sub>2</sub> emissions from solid fuels used in manufacturing industries and construction, the United Kingdom has reported all emissions under the category other (manufacturing industries and construction) except iron and steel. Given that the United Kingdom's energy statistics are disaggregated by the same subsectors as the CRF, the ERT believes that there should be no institutional/capacity barriers to reporting the emissions under the appropriate subsector. Therefore, the ERT recommends that the United Kingdom allocate these emissions to the appropriate subsectors in future submissions in order

to improve transparency and enable the identification of potential time-series inconsistencies in these subsectors.

## 2. Road transport – CO<sub>2</sub>

35. Emissions from road transport are calculated on the basis of either a combination of data on total fuel consumption and the fuel properties or a combination of drive cycle-related EFs and road traffic data. The main change made to the methodology used for the 2006 inventory to estimate emissions for the road transport sector has been the use of a revised set of functions relating fuel consumption factors to speed for different vehicle classes. This has affected the allocation of fuel consumption (petrol and diesel), and hence CO<sub>2</sub> emissions, between the vehicle classes, but the total consumption of petrol and diesel (and hence the total estimated CO<sub>2</sub> emissions) each year for the sector each year has not changed.

### D. Non-key categories

#### Oil and natural gas fugitive emissions – CO<sub>2</sub> and CH<sub>4</sub>

36. The United Kingdom has provided relatively detailed estimates of fugitive emissions. However, there appears to be no documentation in the current NIR describing the methodology for estimating fugitive CO<sub>2</sub> emissions from oil production. The ERT recommends that the United Kingdom provide a description of this methodology in its next annual submission.

## III. Industrial processes and solvent and other product use

### A. Sector overview

37. In 2006, emissions from the industrial processes sector amounted to 26,801.31 Gg CO<sub>2</sub> eq, or 4.1 per cent of total GHG emissions. Emissions in CO<sub>2</sub> eq are not reported for the solvent and other product use sector as only non-methane volatile organic compound emissions are estimated. Emissions from the industrial processes sector decreased by 53.3 per cent between the base year (which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O and 1995 for HFCs, PFCs and SF<sub>6</sub>) and 2006. The key driver for the fall in emissions is the reduction in N<sub>2</sub>O emissions from adipic acid production following the introduction of emission abatement technology. Within the industrial processes sector, 36.1 per cent of GHG emissions were from consumption of halocarbons and SF<sub>6</sub>, followed by 31.5 per cent from mineral products, 21.8 per cent from chemical industry and 9.2 per cent from metal production. The remaining 1.5 per cent was from production of halocarbons and SF<sub>6</sub>. CO<sub>2</sub> accounted for 52.2 per cent of emissions from the industrial processes sector in 2006. F-gases accounted for 38.7 per cent of emissions, while N<sub>2</sub>O and CH<sub>4</sub> contributed 8.8 per cent and 0.3 per cent, respectively.

38. The United Kingdom's inventory is relying increasingly on emissions data from the Pollution Inventory of the Environment Agency. These data are used in the key categories of N<sub>2</sub>O emissions from nitric acid production, N<sub>2</sub>O emissions from adipic acid production and PFCs from aluminium production. The ERT recommends that the United Kingdom review the Environment Agency's QA/QC procedures and report on the results of this review in its next annual submission. The ERT also recommends that the Party make use of its database of data providers' contact information and cite personal communication when justifying key assumptions.

39. For its 2007 submission, the United Kingdom carried out a recalculation of the estimated N<sub>2</sub>O emissions from adipic acid production, which decreased the estimate of emissions from industrial processes for 1990 by 15.8 per cent, corresponding to 4,628.85 Gg CO<sub>2</sub> eq. Details of this recalculation are discussed in section B below.

40. The United Kingdom has reported emissions of HFCs, PFCs and SF<sub>6</sub> as "unspecified mixes". The ERT welcomes the Party's plan to comply with the UNFCCC reporting guidelines by reporting emissions of these gases in a more disaggregated way in its 2010 submission. As part of this work, the

ERT recommends that the United Kingdom report emissions of F-gases by species in metric tonnes, the unit used in the sectoral background data tables.

## **B. Key categories**

### **1. Adipic acid production – N<sub>2</sub>O**

41. For its 2007 submission, the United Kingdom carried out a major revision of the estimated emissions from adipic acid production, which affected mainly the years 1990–1998. The document on which this revision was based has not been included in the list of references in the NIR. During the review, the United Kingdom submitted a copy of the personal communication from the plant operator, which contained some explanatory information. Based on this communication, the difference between the new and the old EFs corresponds to that observed in the change in emissions between the 2007 and 2008 submissions. The ERT recommends that the United Kingdom increase the transparency of its reporting by justifying the change to a lower EF in the NIR of its next annual submission.

### **2. Consumption of halocarbons and SF<sub>6</sub> – HFCs**

42. The ERT observed that the actual emissions reported by the United Kingdom were higher than the potential emissions. In response to questions raised by the ERT during the review, the United Kingdom explained that the current model may contain some methodological errors. The Party also supplied the ERT with a new model and stated that it intends to report emissions using the new model in its 2009 submission. The ERT welcomes this new model, which was developed with the assistance of industry representatives, and recommends that the United Kingdom document the recalculation transparently in its next annual submission. The ERT also recommends, since the new model suggests slightly higher emission estimates for the recent years, that the United Kingdom assess the effect of the change in methodology on the overall pattern of consumption of HFCs in different applications in the country.

## **C. Non-key categories**

### **1. Other (chemical industry) – CO<sub>2</sub>**

43. The United Kingdom has reported emissions from waste chemicals burned. In the 2006 inventory, the Party used an EF for waste oil for this purpose, while, in the 2008 inventory, it applied another EF that is used for waste solvents combusted in the cement industry. This had the effect of reducing estimated emissions by 280.77 Gg CO<sub>2</sub>. In response to a question from the ERT, the United Kingdom provided references for the old and new EFs and supplemented this information with an explanation of the rationale behind the change. The ERT recommends that the United Kingdom include these references, together with the explanation, in the NIR of its next annual submission.

### **2. Aluminium production – PFCs**

44. The ERT asked the United Kingdom to provide separate estimations of tetrafluoromethane (CF<sub>4</sub>) and hexafluoroethane (C<sub>2</sub>F<sub>6</sub>) emissions, since these had been aggregated to an “unspecified mix” in the CRF. The ERT calculated the ratio of CF<sub>4</sub> emissions to C<sub>2</sub>F<sub>6</sub> emissions, which showed a variation of between 8 and 8.6 for the years 1990–1997, while from 1998 onwards the ratio was constant at just under eight. The United Kingdom explained that since 1998 the emission estimates have been based on data from the Pollution Inventory, whereas the previous annual estimates were based on data obtained from plant operators. The ERT commends the United Kingdom’s plan to use for the more recent years the more detailed data which has recently become available. The ERT recommends that the United Kingdom document the recalculations transparently in the CRF as well as in the NIR. The ERT also recommends that documentation be included in the NIR explaining how time-series consistency has been maintained following the introduction of the new data source that replaces the Pollution Inventory.

## IV. Agriculture

### A. Sector overview

45. In 2006, emissions from the agriculture sector amounted to 44,117.15 Gg CO<sub>2</sub> eq, or 6.7 per cent of total GHG emissions. Emissions from the sector decreased by 18.1 per cent between 1990 and 2006. The key driver for the fall in emissions is the reduction in livestock numbers and fertilizer consumption. Within the sector, 54.3 per cent of the emissions were from agricultural soils, followed by 36.6 per cent from enteric fermentation and 8.9 per cent from manure management. The remaining 0.1 per cent of the emissions was from manure management in the OTs and CDs. Most of the emissions were N<sub>2</sub>O, which accounted for 57.6 per cent of the sectoral emissions, while CH<sub>4</sub> accounted for 42.4 per cent.

46. The submissions are complete with regard to the agriculture sector, covering all major sources and gases. Rice cultivation, savannah burning and field burning of crop residues (ceased in 1994) do not occur in the United Kingdom. Recalculations have been undertaken of the estimated emissions for 1990 in the 2008 submission and of the estimated emissions for 2004 in both the 2007 and 2008 submissions. The impact of the recalculations for 1990 was an increase in estimated emissions of 210.99 Gg CO<sub>2</sub> eq compared with the 2007 submission. The impact of the recalculations between the 2006 and 2008 submissions was an increase of 448.22 Gg CO<sub>2</sub> eq for 2004.

47. While it has been indicated in the NIR that tier 1 QC checks were undertaken, there are a number of inconsistencies between the NIR and the CRF tables, some of which were identified during the initial review. It is unclear whether any category-specific QA/QC activities have been undertaken. The ERT recommends that the United Kingdom provide information on category-specific QA/QC activities and, if possible, report the results of these activities in the NIR of its next annual submission.

48. In the NIR it has been indicated that there is an ongoing research programme concerning N<sub>2</sub>O and NH<sub>3</sub>, which may provide new country-specific data in the future.

### B. Key categories

#### 1. Enteric fermentation – CH<sub>4</sub>

49. The United Kingdom calculated CH<sub>4</sub> emissions from beef cattle using the IPCC tier 1 method rather than a tier 2 approach. Typically, there is little difference between estimates calculated using the two methods. The ERT questioned whether the Party's assumption was true for animals of between one and two years old. The Party explained that tier 2 calculations were undertaken for each age class for beef cattle, but in each case the results for animals less than one year old were close to the IPCC default EF. The ERT recommends that the United Kingdom include this information in the NIR of its next annual submission in order to improve transparency.

#### 2. Manure management – N<sub>2</sub>O

50. The United Kingdom assumes that 20 per cent of nitrogen (N) in the animal waste management system (AWMS) will volatilize as nitrogen oxides and NH<sub>3</sub> and so deducts this from the estimated amount of N emitted as N<sub>2</sub>O during manure management. However, as the Party uses the IPCC default EF, which is based on total N treated in the AWMS, this approach leads to an underestimation of N<sub>2</sub>O emissions from manure management. This in turn leads to the misreporting of N<sub>2</sub>O emissions from agricultural soils. The ERT recommends that the United Kingdom provide revised estimates in its next annual submission.

51. In table A.3.6.8 of the NIR it has been indicated that the category other under the AWMS for poultry is poultry litter. Currently, the United Kingdom uses the default N<sub>2</sub>O EF from the Revised 1996 IPCC Guidelines for the category other, which is 0.005 kg N<sub>2</sub>O-N/kg N excreted. This is consistent with the EF indicated in the IPCC good practice guidance for poultry manure without bedding, but it is lower

than the EF for poultry manure with bedding (0.02 kg N<sub>2</sub>O-N/kg N excreted). The ERT recommends that the United Kingdom review the EFs used and provide a justification for the selected EFs in its next annual submission.

### **C. Non-key categories**

#### Manure management – CH<sub>4</sub>

52. Some of the methane conversion factors (MCFs) in table 4.B(a)s2 of the CRF have not been reported. The ERT recommends that the United Kingdom report these factors or insert the relevant notation keys in the CRF tables in its next annual submission.

53. The United Kingdom uses the default EFs for animals other than cattle and deer. The Party does have country-specific data on the allocation of waste to the AWMS, which for some animals such as swine differs significantly from the allocations on which the defaults are based. The United Kingdom is encouraged to revise its emission estimates for swine using the tier 2 methods and the MCFs recommended in the IPCC good practice guidance.

## **V. Land use, land-use change and forestry**

### **A. Sector overview**

54. In 2006, total net removals by the LULUCF sector amounted to 1,961.66 Gg CO<sub>2</sub> eq, or 0.3 per cent of total GHG emissions (without LULUCF). In 1990, the LULUCF sector was a net source of 2,924.20 Gg CO<sub>2</sub> eq, or 0.4 per cent of total GHG emissions (without LULUCF). Between 1990 and 2006, the LULUCF sector changed from being a net source to being a net sink.

55. In the NIR, the United Kingdom has presented complete land-use change matrices for 1990–1991 and 2005–2006. In addition, the annex to the NIR has been expanded to describe the methodology for compiling the inventory in a more transparent manner. These changes are clear improvements on the previous submission.

56. Land-use areas have been reported in four regional subdivisions in the CRF tables. Annual land-use transitions have been reported for each of these regional subdivisions according to the division of areas into pre-1990 and post-1990 periods. Additional information concerning the methodology relating to carbon fluxes owing to land-use change has been given in the annex to the NIR.

57. According to the key category analysis, level assessment, forest land, cropland, grassland and settlements are identified as key categories. Changes to the carbon stocks are caused mainly by land-use change activities and, with the exception of forest lands, changes in soil carbon.

58. In the 2007 submission, some recalculations were made owing to revisions of the AD, the most significant of which was for emissions from settlements, which decreased for 1990 by 22.35 Gg CO<sub>2</sub> eq and increased for 2004 by 45.66 Gg CO<sub>2</sub> eq. In the 2008 submission, the time series was recalculated, primarily owing to the inclusion of estimates for two new categories. Comparing the 2008 submission with the 2007 submission, the impact of these recalculations was an increase in estimated net emissions of 28.94 Gg for 1990 and a decrease in estimated net removals of 5.64 Gg for 2005.

59. The United Kingdom has reported information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, which is voluntary for the 2008 submission. However, during the review, the ERT noted with concern that since the United Kingdom does not use forest inventory statistics, it does not know when harvesting takes place (all forests follow a set pattern based on silvicultural guidelines). In addition, it is not clear from the NIR how the United Kingdom determines how much of the harvested forest area is re-planted and how much is converted to other uses, nor is it clear how the United Kingdom will put in place methods for internal auditing and verification of the estimates based on the planting

statistics. This could create major problems for its reporting in 2010 of mandatory activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

60. The ERT noted that, under source-specific planned improvements, the United Kingdom has indicated that it will investigate the impact of forest management (species planting mix, thinning and harvest age) on forest carbon stocks and fluxes. This will contribute to the future reporting of removals owing to forest management under Article 3, paragraph 4, of the Kyoto Protocol.

## **B. Key categories**

### **1. Land converted to forest land – CO<sub>2</sub>**

61. The carbon stock change of forest biomass and soil stock is estimated using a carbon flow model. The model uses yield tables published in 1981 and is driven by the afforestation rate and silvicultural guidelines. The strength of the approach is that the area of afforestation is well known and the management of forest is standardized; therefore, pre-determined development of forest biomass and soil carbon can be assumed. The disadvantages of the approach are that biomass increment is based on old yield tables, and wood removals are driven by the afforestation rates and assumed management (not by the actual removals). The ERT recommends that the United Kingdom's LULUCF experts seek opportunities to establish a forest inventory with the support of the Department for Environment, Food and Rural Affairs (Defra) and the Forestry Commission to facilitate collection of all the data required for the GHG inventory.

### **2. Land converted to cropland and grassland – CO<sub>2</sub>**

62. The majority of the emissions and sinks in the LULUCF sector originate from land-use changes. The United Kingdom has provided land-use change matrices but no distinction has been made between organic and mineral soils, which leads to the possible under or overestimation of some of the emissions from land-use changes. The ERT recommends that the United Kingdom investigate the possibility of utilizing its vast soil sample databases and soil maps to identify the location of the organic soils. In response to the draft report, the United Kingdom informed the ERT that information on both organic and mineral soils is used in the modelling of soil carbon but that these data are averaged to produce the national estimates of stock changes.

## **C. Non-key categories**

### **1. Forest land remaining forest land – CO<sub>2</sub>**

63. The United Kingdom assumes that all forests converted prior to 1921 are in a steady state and have no net change in carbon stocks. However, no evidence has been provided to support this assumption. The ERT recommends that the United Kingdom provide scientific evidence to support the assumption of a steady state in future submissions.

### **2. Land converted to wetlands – CO<sub>2</sub>**

64. According to the NIR, peat extraction has been reported under grassland remaining grassland. The methodological description indicates that the Party has reported emissions from the peat that is used as a substrate in horticulture. The surface flux of lands converted to peat extraction has not been reported in the NIR or the CRF. The ERT recommends that the United Kingdom increase the completeness of its reporting by including estimated emissions from land converted to peat extraction in its future annual submissions.



## VI. Waste

### A. Sector overview

65. In 2006, emissions from the waste sector amounted to 22,007.29 Gg CO<sub>2</sub> eq, or 3.4 per cent of total GHG emissions. Emissions from the sector decreased by 58.4 per cent between 1990 and 2006. The key driver for the fall in emissions is the reduction in CH<sub>4</sub> emissions from solid waste disposal on land.

66. Within the sector, 88.4 per cent of the emissions were from solid waste disposal on land, followed by 9.4 per cent from wastewater handling. The remaining 2.2 per cent were from waste incineration. The main GHG was CH<sub>4</sub>, which accounted for 92.1 per cent of the sectoral emissions, while N<sub>2</sub>O accounted for 5.9 per cent and CO<sub>2</sub> for 2.0 per cent.

67. Recalculations of the emissions from the waste sector in 2005 resulted in an overall decrease in reported emissions of 31.22 Gg CO<sub>2</sub> eq, or 0.1 per cent (from 22,081.00 in the 2007 submission to 22,049.78 Gg CO<sub>2</sub> eq in the 2008 submission). The greatest changes to emission estimates were made in the categories of solid waste disposal (-28.91 Gg CO<sub>2</sub> eq or -0.1 per cent) and waste incineration (-1.97 Gg CO<sub>2</sub> eq or -0.4 per cent). As a consequence, the emission trend for 1990–2005 was amended from a decrease of 58.3 per cent to a decrease of 58.4 per cent.

68. The following categories have been reported as “NE”: CH<sub>4</sub> from industrial wastewater, owing to the unavailability of AD; and CO<sub>2</sub> from fossil derived carbon in solid waste disposal on land, since it is impossible to estimate this accurately and the amounts are likely to be very small.

### B. Key categories

#### 1. Solid waste disposal on land – CH<sub>4</sub>

69. A model based on a modified tier 2 methodology was used to estimate CH<sub>4</sub> emissions from solid waste disposal on land. Although AD have been determined from different studies for different periods, the trends in the AD over the period 1990–2006 present a reasonable pattern, which gives confidence that time-series consistency has been maintained. The oxidation factor used has been simplified as requested by the previous ERT. The method for calculating the AD has been explained in a transparent manner in the NIR. The NIR also provides useful information on policies and measures influencing the reduction in the quantities of landfilled wastes and therefore the reduction in CH<sub>4</sub> emissions. The ERT recommends that the United Kingdom provide detailed information in its next annual submission on any improvements it makes.

70. The recovery rate of CH<sub>4</sub> kept increasing over time, reaching over 72.3 per cent in 2006. In the NIR it has been stated that the recovery rates of CH<sub>4</sub> in recent years (2000–2005) were derived from a model. The last input of gas utilization data into the model was for 2005 and the last input of flaring capacity data was for 2002. Gas utilization and flaring were assumed to remain constant thereafter. The ERT recommends that the United Kingdom collect updated survey data in accordance with the IPCC good practice guidance in order to avoid an overestimation of the rate of CH<sub>4</sub> recovery.

#### 2. Wastewater handling – N<sub>2</sub>O

71. The IPCC default methodology was used to estimate N<sub>2</sub>O emissions from human sewage. An inconsistency in the time series was observed for N<sub>2</sub>O emissions from human sewage in previous reviews. In the NIR it has been indicated that the reason for this inconsistency was the adoption of different data sources for per capita protein consumption. However, the time series presented in the NIR for protein consumption in 2003 (26.0 kg/person/year) is significantly lower than the estimate provided by the United Kingdom to the Food and Agriculture Organization of the United Nations

(38.3 kg/person/year). The ERT recommends that the United Kingdom review this assumption and provide an explanation for this difference.

72. N<sub>2</sub>O emissions from industrial wastewater have been reported as “NE” because of a lack of AD and of information on processes, which could lead to an underestimation of the national total GHG emissions. During the review, the United Kingdom informed the ERT that data and methods used to estimate emissions from industrial wastewater were being reviewed. The ERT recommends that the Party include an estimate of these emissions in its future annual submissions.

### **C. Non-key categories**

#### **1. Wastewater handling – CH<sub>4</sub>**

73. The United Kingdom did not estimate CH<sub>4</sub> emissions from industrial wastewater because of a lack of information on AD and processes. During the review, the United Kingdom informed the ERT that data and methods used to estimate emissions from industrial wastewater were being reviewed. The ERT recommends that the Party include an estimate of emissions from this source in its future annual submissions.

#### **2. Waste incineration – CO<sub>2</sub>**

74. The United Kingdom used country-specific EFs to estimate CO<sub>2</sub> emissions from waste incineration. Sufficient clarity on geographical coverage has not been provided in the NIR. During the review, the Party explained that there are currently no large chemical waste incinerators in Scotland and Northern Ireland but that minor incinerators might exist. The United Kingdom informed the ERT that emissions from chemical waste are under review. The ERT recommends that the United Kingdom estimate emissions from incinerators in Scotland and Northern Ireland on the basis of this review for its future annual submissions.

## **VII. Other issues**

### **1. Changes to the national system**

75. Sufficient information has been presented in the NIR to enable the functioning of the United Kingdom’s national system with all its components to be assessed. Based on the information included in the NIR, the national system has not been modified since the previous review and it is functioning as expected. Improvements are planned with regard to the formalization of data collection between Defra and other public institutions through data supply agreements. The ERT encourages the United Kingdom to secure these formal agreements between Defra and key data providers and to provide information of this in its NIR. At the same time, Defra is encouraged to ensure the continued involvement of the three institutions which produce the inventory.

### **2. Changes to the national registry**

76. The United Kingdom has not reported on any changes to its national registry in the 2008 submission. In response to questions raised by the ERT during the review, the United Kingdom confirmed that no changes have been made to the national registry.

### **3. Commitment period reserve**

77. The United Kingdom has not reported its commitment period reserve in the 2008 submission. In response to questions raised by the ERT during the review, the Party reported that its commitment period reserve has not changed since the initial report review (3,070,872,567 t CO<sub>2</sub> eq). The ERT agrees with this figure. The ERT recommends that the United Kingdom include information on its commitment period reserve in its next annual submission.

## VIII. Conclusions and recommendations

78. In 2008, the United Kingdom submitted an inventory which contains a complete set of CRF tables for the period 1990–2006 and an NIR, in accordance with the deadline established in the UNFCCC reporting guidelines. The submission is largely complete in terms of coverage of source/sink categories and GHGs, and geographical coverage, and displays a high level of transparency. However, the ERT concluded that the completeness of the inventory could be further improved by reporting emission estimates for other activities that are known to occur in the United Kingdom. The ERT concluded that the United Kingdom's 2008 inventory submission is of a high quality and shows improvement with regard to most of the issues identified in previous reviews.

79. In general terms, the completeness, consistency and comparability of the 2008 submission is in conformity with the UNFCCC reporting guidelines, the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. However, the ERT identified instances of under and overestimation of emissions (see paras 32, 51, 63, 75 and 77 above) and transparency could be improved by describing the data and methods used to calculate GHG emissions in more detail in the NIR.

80. The key recommendations are that the United Kingdom:

- (a) Provide more information in the NIR on its QA procedures and the external review of the inventory;
- (b) Submit complete information on the categories reported as "IE" in both the CRF and the NIR;
- (c) Estimate emissions from categories reported as "NE", giving priority to the larger sources;
- (d) Enhance the explanation of and justification for the adoption of new EFs;
- (e) Allocate energy emissions from the category other (manufacturing industries and construction) to the appropriate subsectors;
- (f) Compare the facility-level data on stationary combustion from DUKES used in the inventory with the facility-level data from the EU ETS to identify discrepancies;
- (g) Report emissions of F-gases by species in metric tonnes, which is the unit used in the sectoral background data tables of the CRF;
- (h) Adopt the new model for calculating HFC emissions from aerosols in the next annual submission;
- (i) Revise the estimates of N<sub>2</sub>O from manure management and agricultural soils for the next annual submission;
- (j) In the LULUCF sector, develop methodologies capable of differentiating between mineral and organic soils.

## IX. Questions of implementation

81. No questions of implementation were identified by the ERT during the review.

Annex

**Documents and information used during the review**

**A. Reference documents**

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <<http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>>.

Intergovernmental Panel on Climate Change. “*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*”. Available at <<http://www.ipcc-nggip.iges.or.jp/public/gp/english/>>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <<http://www.ipcc-nggip.iges.or.jp/public/gp/landuse/gp/landuse.htm>>.

“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/SBSTA/2006/9. Available at <<http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>>.

“Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention”. FCCC/CP/2002/8. Available at <<http://unfccc.int/resource/docs/cop8/08.pdf>>.

“Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol”. Decision 19/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>>.

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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>>.

**B. Additional information provided by the Party**

Responses to questions during the review were received from Mr. John Watterson and Ms. Joanna Jackson (AEA Technology) and Ms. Yamide Dagnet (Department for Environment, Food and Rural Affairs), including additional material on the methodology and assumptions used.

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