

The United Kingdom's Initial Report under the Kyoto Protocol

Pursuant to the modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change

**UK Department for Environment, Food and Rural Affairs
20 November 2006**

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Foreword

By the Secretary of State for Environment, Food and Rural Affairs

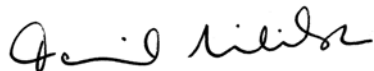
I am pleased to present the UK's Initial Report under the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

This report facilitates the calculation of the UK's assigned amount and outlines how we propose to account for our emissions and assigned amount in line with the Article 7.4 modalities of the Kyoto Protocol.

It also sets out more broadly how the UK plans to deliver its commitments under Kyoto. We have established the framework and structures necessary to track our emissions of greenhouse gases and ensure the integrity of registry transactions. We have made the choices and decisions required for the land use, land use change and forestry sector.

We are currently on track to deliver our Kyoto target of a 12.5 per cent reduction averaged over the period 2008-2012, on the basis of existing policies and measures. On the basis of the territorial coverage in this report, emissions of the basket of greenhouse gases are estimated to have reduced by 15.1 per cent between the base year and 2004.

We look forward to the challenges ahead and will continue to work with our international partners to combat the threats posed by climate change.



The Rt Hon David Miliband MP

Executive Summary

The UK's Initial Report under the Kyoto Protocol shows how the UK has implemented the requirements under the Kyoto Protocol to '*facilitate the calculation of its assigned amount and demonstrate its capacity to account for its emissions and assigned amount*'. The report conforms with the requirements of the Modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol, as specified in Decision 13/CMP.1 of the first Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol.

The Initial Report contains a number of technical definitions, calculations, decisions and descriptions. In particular, the calculation of the UK's assigned amount, once agreed by the UNFCCC, represents the baseline of emissions against which the UK's commitments will be assessed at the end of the first commitment period under Kyoto. Submission of this report is also a pre-condition for the UK to qualify for participation in the Kyoto Protocol flexible mechanisms (international emissions trading, joint implementation, clean development mechanism).

The main elements of this report are:

- A **complete inventory** of anthropogenic emissions by source and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for 1990-2004

- Identification of **1995** as the UK's selected base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride

- Calculation of the UK's **assigned amount** as:

3,412,080,630 tonnes of carbon dioxide equivalent (or assigned amount units)

- Calculation of the UK's **commitment period reserve** as:

3,070,872,567 tonnes of carbon dioxide equivalent (or assigned amount units)

- Identification of UK's single minimum values for use in accounting for its activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol as:

- Tree crown cover: **20 per cent**
- Minimum land area: **0.1 hectares**
- Minimum height: **2 metres**
- Minimum width: **20 metres**

- The UK's decision to elect only **forest management** as an activity under Article 3, paragraph 4 during the first commitment period

- The UK's intention to use **entire commitment period accounting** for all activities under Article 3, paragraphs 3 and 4 for the first commitment period
- A description of the UK's **national system** in accordance with Article 5, paragraph 1 and the guidelines specified in Decision 19/CMP.1 detailing the legal, institutional and procedural arrangements established in the UK for the preparation and reporting of an annual greenhouse gas inventory
- A description of the UK's **national registry** in accordance with the guidelines under Article 7.

1. Introduction

The United Kingdom of Great Britain and Northern Ireland hereby submits its **Initial Report under the Kyoto Protocol** to the United Nations Framework Convention on Climate Change (UNFCCC) pursuant to the modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol.

1.1 UK commitments

The UK is one of 15 Member States of the European Union (EU) with a legally binding emission reduction commitment under the Kyoto Protocol. The EU has a collective target to reduce its emissions by 8 per cent relative to base year levels over the period 2008-2012. Under the burden sharing agreement, the EU's target was distributed between Member States to reflect their national circumstances, requirements for economic growth and scope for further emissions reductions. Within this arrangement the UK has undertaken to reduce its basket of greenhouse gas emissions by 12.5 per cent below base year levels on average over the first commitment period.

1.2 Contents and structure of the initial report

The contents of this report are prepared in accordance with Decision 13/CMP.1 which was adopted by the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, held in Montreal, Canada in December 2005.

This Decision states that: *'each Party included in Annex I with a commitment inscribed in Annex B shall submit to the secretariat, prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, **whichever is later**, the report referred to in paragraph 6 of the annex to the present decision'*. For the UK, entry into force of the Kyoto Protocol occurred on 16 February 2005, so the later deadline of 1 January 2007 applies in respect of submission of this report.

Paragraph 6 of the Annex to Decision 13/CMP.1 states that: *'each Party included in Annex I shall facilitate the calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, for the commitment period and demonstrate its capacity to account for its emissions and assigned amount. To this end, each Party shall submit a report, in two parts, containing the information specified in paragraphs 7 and 8 below'*. The present report is therefore structured according to the information required by these paragraphs. The table in Annex 1 maps the requirements of the Decision text with the sources of information supplied by the UK.

The Initial Report must contain the following information or references to such information where it has been previously submitted to the secretariat of the UNFCCC:

Part One

- a) Complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for all years from 1990, or another approved base year or period under Article 3, paragraph 5, to the most recent year available, prepared in accordance with Article 5, paragraph 2, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP), taking into account any relevant decisions of the Conference of the Parties
- b) Identification of its selected base year for HFCs, PFCs, SF₆ in accordance with Article 3, paragraph 8
- c) The agreement under Article 4, where the Party has reached such an agreement to fulfil its commitments under Article 3 jointly with other Parties
- d) Calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, on the basis of its inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol

Part Two

- a) Calculation of its commitment period reserve in accordance with decision 11/CMP.1
- b) Identification of its selection of single minimum values for tree crown cover, land area and tree height for use in accounting for its activities under Article 3, paragraphs 3 and 4, together with a justification of the consistency of those values with the information that has been historically reported to the FAO of the UN or other international bodies, and in the case of difference, explanation of why and how such values were chosen, in accordance with decision 16/CMP.1
- c) Identification of its election of activities under Article 3, paragraph 4, for inclusion in its accounting for the first commitment period, together with information on how its national system under Article 5, paragraph 1, will identify land areas associated with the activities, in accordance with decision 16/CMP.1
- d) Identification of whether, for each activity under Article 3, paragraphs 3 and 4, it intends to account annually or for the entire commitment period
- e) Description of its national system in accordance with Article 5, paragraph 1, reported in accordance with the guidelines for the preparation of information required under Article 7 of the Kyoto Protocol
- f) Description of its national registry, reported in accordance with the guidelines for the preparation of information required under Article 7 of the Kyoto Protocol.

1.3 Fulfilment of eligibility requirements

The Initial Report is a precondition for the participation in the Kyoto Protocol flexible mechanisms (international emissions trading, joint implementation and clean development mechanism). Other eligibility requirements, and how the UK has met them, are:

- Ratification of the Kyoto Protocol. The UK ratified the Kyoto Protocol on 31 May 2002.
- Calculation of assigned amount, as referred to in Articles 3.7 and 3.8 and Annex B of the Protocol expressed in terms of tonnes of carbon dioxide equivalent emissions. The present report fulfils this requirement.
- Having in place a national system for estimating emissions and removals of greenhouse gases within their territory. The UK has established its national system and reports this in Section 5 of the present report.
- Having in place a national registry to record and track the creation and movement of registry units (ERUs, CERs, AAUs and RMUs) and annually reporting such information to the secretariat. The UK has established its national registry and reports this in Section 6 of the present report.
- Annual reporting of information on greenhouse gas emissions and removals to the secretariat. The UK has reported its greenhouse gas emissions and removals annually to the UNFCCC each year since 1995, and will continue to do so.

1.4 UK greenhouse gas inventory

The UK submitted its greenhouse gas inventory comprising the National Inventory Report (NIR) and Common Reporting Format (CRF) tables on time to the UNFCCC by 15 April 2006. The information provided in the NIR was updated later in the year and a further version of the NIR was issued. The mid-year revision was required to ensure that the UK's base year for calculating assigned amount is as complete and accurate as possible. The revisions were necessary to take account of:

- The decision of Gibraltar - an Overseas Territory - to join the UK's instruments of ratification of the UNFCCC and Kyoto Protocol
- Revised estimates of methane emissions from landfill, following a reassessment by the UK of the evidence on landfill emissions in the light of a UNFCCC review of the UK inventory conducted in 2005 and other emerging evidence from UK sponsored research into atmospheric concentrations of methane attributable to human activities in the UK.

The combined effect of these changes is to increase the base year emission estimate relative to April 2006 by about 1.5 per cent. As the revisions are applied to the full time series, the trend in UK greenhouse gas emissions is not much affected.

A summary of the inventory submissions made to the UNFCCC in 2006 is provided in [Annex 2](#).

1.5 Territorial coverage

The territorial coverage of the UK greenhouse gas (GHG) inventory as reported each year to UNFCCC is consistent with the definition of the 'economic territory of the United Kingdom' used by the Department for Trade and Industry, the UK Office for National Statistics and the European System of Accounts.

The territorial coverage has been extended to include complete coverage of emissions for the UK's Crown Dependencies and inclusion for the first time of a number of UK Overseas Territories that have joined, or that have signalled a wish to join, the UK's ratifications of the UNFCCC and the Kyoto Protocol.

Part One

2. Calculation of UK's assigned amount

2.1 Key points

- The UK's base year estimate of the Kyoto basket of greenhouse gases is **779.9 million** tonnes of carbon dioxide (CO₂) equivalent.
- The UK's greenhouse gas emissions are estimated to have fallen by **15.1 per cent** between the Kyoto base year and 2004
- The UK's assigned amount covering the 5 years of the first commitment period is calculated at full precision to be **3,412,080,630** tonnes of CO₂ equivalent (or assigned amount units).

2.2 UK greenhouse gas emissions, 1990 to 2004

Table 2.1 below provides the full time series of greenhouse gas (GHG) emissions for the period 1990 to 2004 for the UK. This information is also provided in Table ES5b of Issue 2 of the UK GHG national inventory report submitted in 2006¹.

The UK GHG inventory presented here includes emissions from the UK's Crown Dependencies of Guernsey, Jersey and Isle of Man, and from the UK's Overseas Territories of Bermuda, Cayman Islands, Falkland Islands, Montserrat and Gibraltar, who have joined, or will join, the UK's instruments of ratification to the UNFCCC and the Kyoto Protocol.

Carbon dioxide emissions exclude all emissions and removals associated with land use, land use change and forestry (LULUCF) in accordance with the Art 7.4 modalities for the accounting of assigned amounts. LULUCF emissions and removals enter the table only through rows labelled Article 3.3, Article 3.4 and Article 3.7:

- Article 3.3 represents the net emissions or removals of Afforestation plus Reforestation minus Deforestation (ARD) since 1990
- Article 3.4 represents the net flux due to forest management since 1990 (the UK has only elected forest management as an activity under Art 3.4 – see Section 4 of the present report)
- Article 3.7 represents emissions in 1990 from deforestation (the 'D' estimate), added to the base year for Kyoto reporting (only applicable to countries with a net LULUCF emission in 1990, which is the case for the UK).

¹ UK Greenhouse Gas Inventory, 1990 to 2004, Issue 2 available at <http://www.naei.org.uk/reports.php>

Table 2.1: UK greenhouse gas emissions 1990 to 2004 (MtCO₂ equivalent)

	Base Year	1990	1991	1992	1993	1994	1995
Carbon dioxide	590.3	590.3	597.3	580.8	567.1	559.4	549.8
Methane	103.6	103.6	102.8	101.3	98.2	91.2	90.2
Nitrous oxide	68.4	68.4	66.3	59.5	55.7	58.7	57.1
HFCs	15.5	11.4	11.9	12.3	13.0	14.0	15.5
PFCs	0.5	1.4	1.2	0.6	0.5	0.5	0.5
SF6	1.2	1.0	1.1	1.1	1.2	1.2	1.2
Total	779.5	776.1	780.5	755.6	735.6	725.0	714.3
Article 3.3		0.2	0.36	0.42	0.31	0.17	-0.04
Article 3.4 (capped at -1.36 MtCO ₂)		-1.36	-1.36	-1.36	-1.36	-1.36	-1.36
Art 3.7 'D' estimate	0.37						
KP Total	779.9	775.0	779.5	754.6	734.6	723.8	712.9

	1996	1997	1998	1999	2000	2001	2002
Carbon dioxide	571.7	549.1	551.4	542.3	548.0	563.4	547.3
Methane	87.8	83.0	78.3	73.0	68.5	62.7	59.7
Nitrous oxide	58.9	60.6	57.7	44.5	44.3	42.1	40.5
HFCs	16.7	19.2	17.3	10.8	9.1	9.7	9.9
PFCs	0.5	0.4	0.4	0.4	0.5	0.4	0.3
SF6	1.3	1.2	1.3	1.4	1.8	1.4	1.5
Total	736.8	713.4	706.3	672.5	672.2	679.7	659.2
Article 3.3	-0.24	-0.49	-0.71	-0.87	-1.03	-1.14	-1.34
Article 3.4 (capped at -1.36 MtCO ₂)	-1.36	-1.36	-1.36	-1.36	-1.36	-1.36	-1.36
Art 3.7 'D' estimate							
KP Total	735.2	711.6	704.2	670.2	669.8	677.2	656.5

	2003	2004	1990-2004 % change	Base year – 2004 % change
Carbon dioxide	558.9	562.4	-4.7%	-4.7%
Methane	53.6	51.8	-50.0%	-50.0%
Nitrous oxide	40.1	40.8	-40.3%	-40.3%
HFCs	10.2	8.9	-22.0%	-42.7%
PFCs	0.3	0.4	-74.9%	-25.2%
SF6	1.3	1.1	9.5%	-9.0%
Total	664.5	665.3	-14.3%	-14.7%
Article 3.3	-1.55	-1.76		
Article 3.4 (capped at -1.36 MtCO ₂)	-1.36	-1.36		
Art 3.7 'D' estimate				
KP Total	661.6	662.2	-14.6%	-15.1%

2.3 Selected base year for HFCs, PFCs, SF₆

The UK has selected 1995 as the base year for the fluorinated gases in accordance with the choice under Article 3, paragraph 8 of the Kyoto Protocol.

2.4 Agreement under Article 4

The UK has agreed to fulfil its commitments under Article 3 of the Kyoto Protocol jointly as part of the European Union. The legal basis for this agreement is Decision 2002/358/EC concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder. The monitoring and implementation arrangements are set out in Decision 280/2004/EC concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.

2.5 Calculation of UK's assigned amount

The UK's assigned amount is estimated according to the formula:

Base Year Total from Table 2.1 x 87.5% (representing the UK's 12.5% Kyoto emission reduction target) x 5 (representing the 5 years of the first commitment period 2008-2012)

= 779,904,144 tonnes CO₂ equivalent x 87.5% x 5

= **3,412,080,630 tonnes CO₂ equivalent**

or since 1 tonne of CO₂ equivalent equals one assigned amount unit

= **3,412,080,630 assigned amount units**

Part Two

3. Calculation of the UK's commitment period reserve

The Annex to Decision 11/CMP.1 (paragraph 6) specifies that: '*each Party included in Annex I shall maintain, in its national registry, a commitment period reserve which should not drop below 90 per cent of the Party's assigned amount calculated pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, or 100 per cent of five times its most recently reviewed inventory, whichever is lowest*'.

Therefore the UK's commitment period reserve is calculated as:

Either

90% of the UK's assigned amount from Section 2 above

= $0.9 \times 3,412,080,630$ tonnes CO₂ equivalent

= 3,070,872,567 tonnes CO₂ equivalent.

or

100% of 5 x most recently reviewed inventory (2003)

= $5 \times 649,568,233$ tonnes CO₂ equivalent

= 3,247,841,167 tonnes CO₂ equivalent

The lower of the two numbers is that calculated as 90 per cent of the UK's assigned amount.

The UK's Commitment Period Reserve is therefore **3,070,872,567 tonnes of CO₂ equivalent (or assigned amount units)**.

4. Land use, land use change and forestry

4.1 Selection of single minimum values under Article 3, paragraphs 3 and 4 of the Kyoto Protocol

Article 3.3 of the Kyoto Protocol requires Parties in meeting their emissions reduction commitments to account for Afforestation, Reforestation and Deforestation (ARD) since 1990.

Accounting ARD under Article 3.3 requires i) definition of forest, ii) knowledge of forest type and planting/deforestation date, iii) geographical location, and iv) a method to distinguish deforestation from areas harvested and replanted. On i) to iv) the UK has chosen the following definitions and single minimum values:

- i) A definition of 'forest' as agreed with the Forestry Commission comprising:
 - a. a minimum area of 0.1 hectares;
 - b. a minimum width of 20 metres;
 - c. tree crown cover of at least 20 per cent, or the potential to achieve it; and
 - d. a minimum height of 2 metres, or the potential to achieve it.
- ii) Forest type and planting date to be determined from Forestry Commission planting statistics. Deforestation dates will be derived from administrative records, inventory data and mapping information.
- iii) Location of forest areas to be determined statistically within the squares of a 20 km grid covering the UK.
- iv) To distinguish deforestation from replanting after harvest by using geographical information from administrative records, inventory data and mapping information.

The single minimum values that the UK has chosen for reporting under Articles 3.3 and 3.4 of the Kyoto Protocol are consistent with information provided by the UK to the FAO.

4.2 Election of activities under Article 3, paragraph 4

Article 3.4 of the Kyoto Protocol allows Parties flexibility to choose Forest Management, Cropland Management, Grazing Land Management and Revegetation towards meeting commitments, but this is not mandatory. For the following reasons the UK elects Forest Management as an activity under Article 3.4, but does not elect Cropland Management, Grazing Land Management and Revegetation:

- In accordance with the Annex to Decision 16/CMP.1, credits from Forest Management are capped in the first commitment period. For the UK the cap is a relatively modest 0.37 MtC (1.36 MtCO₂) per year. However, we are confident that the UK has the technical ability to estimate increases in carbon stocks in forests.
- Emissions from Cropland Management and Grazing Land Management should decline gradually. However we choose not to include these activities under the Protocol because the monitoring requirements in identifying land areas subject to different management practices are likely to be disproportionate compared to the benefits that may accrue from their inclusion, and there is some risk to compliance from the uncertainties involved as a 2005 publication² in *Nature* suggests.
- Revegetation under UK conditions is likely to be due mainly to expansion in forest area, already covered under Article 3.3. Revegetation is most relevant to countries, such as Iceland, where environmental extremes mean that woody vegetation may not reach the minimum requirements for a forest in either height or crown cover. We do not propose to account for it separately.

The UK will determine land areas associated with Forest Management statistically within the squares of a 20 km grid covering the UK.

4.3. Accounting choice under Article 3, paragraphs 3 and 4

The UK intends to account for Article 3.3 and 3.4 LULUCF activities for the entire commitment period, rather than annually. This is because the periodic nature of forest surveys (eg National Inventory of Woodland and Trees) means that a more detailed and accurate assessment, based on the best possible data, will be possible at the end of the first commitment period.

² Bellamy et al. (2005) *Carbon losses from all soils across England and Wales 1978–2003*. *Nature* vol. 437 pp. 245-248.

5. Description of the UK's national system

The description of the UK's national system below is in accordance with the guidelines set down in Decision 19/CMP.1. A national system includes all the institutional, legal and procedural arrangements for estimating greenhouse gas emissions and removals and for reporting and archiving inventory information. Further information on the UK's national system and detailed methodological text are provided in the UK's National Inventory Report submitted in 2006.

5.1 Contact details

Title	National Focal Point	Inventory Agency
Name	Chris Dodwell	Dr John Watterson
Organisation	Department of Environment, Food and Rural Affairs	AEA Energy and Environment
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Website	www.defra.gov.uk	www.naei.org.uk

5.2 Single national entity

The Department for Environment, Food and Rural Affairs (Defra) has been appointed as the Single National Entity for the UK. Defra has overall responsibility for the UK Greenhouse Gas Inventory and the UK National System and carries out this function on behalf of Her Majesty's Government, the Devolved Administrations (England, Wales, Scotland and Northern Ireland) and the UK Crown Dependencies and Overseas Territories that have joined UK ratifications. Defra is responsible for the institutional, legal and procedural arrangements for the national system and for the strategic development of the national inventory.

Within Defra, the International Climate Change and Ozone (ICCO) Division³ is the national focal point while the Climate, Energy, Science and Analysis (CESA) Division administers the responsibilities associated with the national system. CESA coordinates expertise from across Government and manages research contracts to ensure that the UK Greenhouse Gas Inventory meets the

³ Formerly Global Atmosphere Division.

international standards set out in the UNFCCC reporting guidelines, the Kyoto Protocol and the Revised 1996 IPCC Guidelines and IPCC Good Practice Guidance.

CESA is responsible for managing 2 main research contracts that underpin the preparation and development of the national inventory, covering greenhouse gas emissions and removals. CESA also manages a number of smaller research contracts set up as required to improve estimates of emissions from certain sectors, which are then fed into the development of the national inventory. The main research contracts are currently with:

- AEA Energy and Environment (AEA)⁴, responsible for all aspects of national inventory preparation, reporting and quality management. AEA prepares the national atmospheric emissions inventory (NAEI) which is the core air emissions database from which the greenhouse gas inventory (GHGI) is extracted to ensure consistency in reporting across all air emissions for different reporting purposes (UNFCCC, UNECE etc). Activities include: collecting and processing data from a wide range of sources; selecting appropriate emission factors and estimation methods according to IPCC guidance; compiling the inventory; applying QA/QC; carrying out uncertainty assessments; delivering the National Inventory Report (NIR) and the Common Reporting Format (CRF) tables by deadlines set to the EU Monitoring Mechanism (EUMM) and the UNFCCC on behalf of Defra; assisting with Art 8 reviews and archiving.
- Centre for Ecology and Hydrology (CEH), responsible for preparation and development of the LULUCF inventory, covering both emissions and removals.

Another division in Defra, Sustainable Food and Farming Strategy (SFFS), manages a research contract that feeds into the main inventory and this is currently with:

- Institute for Grassland and Environmental Research (IGER), responsible for the preparation and development of the agricultural inventory.

5.3 Legal powers for the national inventory

The UK has evolved a system of data collection that has relied upon legislation set up for other purposes. For example, the UK inventory relies on data supplied by UK environmental regulatory agencies (The Environment Agency of England & Wales, the Scottish Environment Protection Agency and the Environment and Heritage Service in Northern Ireland) via their industrial point source pollution inventories. These inventories are established under the Integrated Pollution Prevention and Control (IPPC) regulations. Similarly, the Department for Trade and Industry (DTI) produces national energy statistics under the Statistics of

⁴ Formerly Netcen.

Trade Act and these are used to derive emission estimates for the carbon dioxide inventory.

Recognising the fact that such a system of data collection might not meet the standards required under the Kyoto Protocol, the UK introduced regulations specifically for national inventory purposes which took effect from November 2005⁵. Regulation 10 provides Defra's Secretary of State with wide-ranging statutory powers to mandate information required for national inventory purposes. This supports an annual data request system should it fail to deliver what is required to enable the UK to meet its legally binding reporting commitments. The regulations include penalties for failure to comply, and authority for entry to premises to obtain or verify information.

To ensure that the system works most effectively as it currently stands and to minimise the need for legislative action, CESA is developing a range of formal agreements with core data suppliers. These agreements will formalise the acquisition of data and clarify the main requirements of quality, format, security and timing of data, for the national inventory.

5.4 Roles and responsibilities in inventory development process

The table in Annex 3 shows the main organisations engaged in the UK national system, and their roles and responsibilities in relation to the preparation and development of the national inventory. It includes organisations from the following categories, many of whom are classed as key data providers:

- Government Departments
- Agencies of Government eg Environment Agencies
- Industry bodies or associations
- Consultants working to Government

5.5 Processes for official consideration and approval of inventory

The national inventory has been planned, prepared and managed according to the information provided in this report. It is generally regarded to conform to international standards and is delivered on time to the EUMM and UNFCCC each year. To meet the requirements of Decision 19/CMP.1, CESA established in May 2006 a formal cross-Government steering committee formed of representatives from organisations included in Annex 3, tasked with the official consideration and approval of the national inventory prior to submission to the UNFCCC and the Kyoto Protocol.

As inventory research needs are identified, project teams with workstrand owners are formed to review methods, activity data, emission factors and emission estimates at a sectoral level and report back to the steering committee on a

⁵ Greenhouse Gas Emissions Trading Scheme (Amendment) and National Emissions Inventory Regulations 2005, available at: <http://www.opsi.gov.uk/si/si2005/20052903.htm>

regular basis. The committee is responsible for ensuring the inventory meets international standards of quality, accuracy and completeness, and is delivered on time each year to the EU Monitoring Mechanism and the UNFCCC. These arrangements formalise and build upon a national system that has been established in the UK and has worked well for over a decade.

5.6 Inventory QA/QC Programme

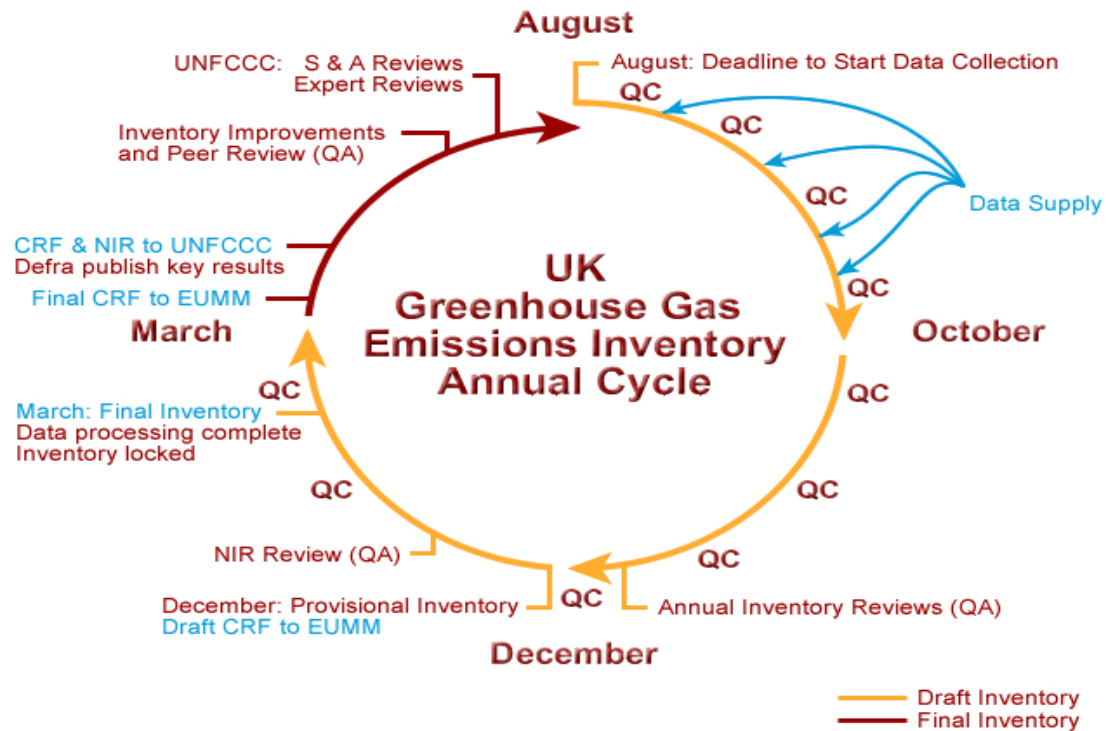
The Inventory Agency, AEA Energy and Environment, operates a comprehensive QA/QC programme which complies with the Tier 1 procedures outlined in the IPCC Good Practice Guidance (IPCC, 2000). This programme incorporates a number of QA/QC activities which are carried out each year at various stages of the inventory compilation process. These are described in [Annex 4](#). The national inventory has been subject to ISO 9000 since 1994 and is now subject to BS EN ISO 9001:2000. It is audited by Lloyds and AEA's internal QA auditors. Lloyds has audited the national inventory favourably on three occasions in the last ten years, the last occurring in May 2003. The emphasis of these audits was on authorisation of personnel to work on inventories, document control, data tracking and spreadsheet checking, and project management.

The inventory is moving towards a Tier 2 source category-specific QC compliance, in addition to complying with the Tier 1 procedures discussed above. Steps to move the QC towards Tier 2 compliance include:

- ▶ Review of QA/QC provisions and engagement with Key Data Providers to determine their QA/QC procedures and if necessary recommend enhancements
- ▶ Improvements to the data processing systems of the Inventory Agency (e.g. a complete review of the system used to calculate emissions from the road transport sector, via the development of a new database).

5.7 Inventory preparation and management

The annual inventory cycle is shown in [Fig 5.1](#). Inventory compilation is carried out in accordance with the principles and procedures set out in the Revised 1996 IPCC Guidelines for national greenhouse gas inventories and the IPCC Good Practice Guidance. The inventory cycle starts in August with the collection of data from key organisations and industry via telephone, email, letter and the internet. Once collected, the data is checked and processed using spreadsheets and databases. Emission factors and methodologies are chosen and emissions estimates are compiled and reported to both the EUMM and UNFCCC. Throughout the inventory cycle, QC activities are carried out to ensure that data is of a high standard and to minimise random and systematic errors.

Fig 5.1: Annual Inventory Cycle

Each year, the following activities are carried out:

5.7.1 Data collection and processing

Requests for activity data and background data are issued to a wide range of data suppliers. Each request is issued with a unique code, and a database is used to track the request and the data supplied from that request. Activity data received are examined and anomalies are investigated, such as time series discrepancies, or large changes in values from the previous to the current inventory year.

5.7.2. Method and emission factor selection

The methods used to estimate emissions are described in detail within the National Inventory Report (NIR) submitted to the EUMM and UNFCCC annually. The direct and indirect GHGs reported are estimated using methodologies corresponding mostly to the detailed sectoral Tier 2/3 methods in the IPCC Guidelines.

For most of the key GHG emission sources, UK-derived emission factors are used, drawing on UK resources of emission measurements by process operators, fuel characterisation data and specific research into emission factor development. Where such UK data are not available, default emission factors from sources such as IPCC guidance, EMEP-CORINAIR and USEPA AP-42 are used. Improvements to calculation methods are normally implemented before the

inventory is compiled. These improvements are based on recommendations of the UNFCCC as a result of initial checks performed by the secretariat, Synthesis and Assessment Reports, and expert reviews of previous UK inventory submissions (in-country, central and desk reviews). They are also based on results of peer reviews as elaborated below and relevant research sponsored by Defra or other organisations.

5.7.3 Preparation of emission estimates

Emission estimates of direct and indirect GHGs are prepared using the general formula:

$$\text{Emission} = \text{Activity data} \times \text{Emission factor}$$

The selection of methods and summary of key sources of activity data for the UK inventory are outlined in the tables below which include reference to the appropriate section of the 2006 NIR for further details:

Table 5.1: Methods used to estimate UK emissions of the direct GHGs

CRF sector	Comments on methods
1A	Basic combustion module (see Annex 3, Section A3.3.1) Transport model (see Annex 3, Section A3.3.5)
1B	Carbon Balance approach (See Annex 3, Section A3.3.8.1.2) UKOOA EEMS inventory (See Annex 3, Section A3.3.8.2) Transco gas leakage model (See Annex 3, Section A3.3.8.2.6)
2A	Cement production: IPCC Tier 2 approach (see Chapter 4, Section 4.4.2)
2B	Emissions calculated based on data from industry and the Pollution Inventory Carbon emission from certain non-energy uses (NEU) of fuel reported here
2C	Iron and Steel - 2 stage carbon balance (see Annex 3, Section A3.3.3.3 and A3.4.3.1) Spreadsheet model to estimate emissions of F-gases
2D	Emissions calculated based on USEPA Compilation of Air Emission Factors Emissions calculated based on Industry and Government data sources
2E, 2F	Spreadsheet model to estimate emissions of F-gases
3A	(No direct GHGs emitted from this sector)
3B	(No direct GHGs emitted from this sector)
3C	(No direct GHGs emitted from this sector)
3D	(No direct GHGs emitted from this sector)
4A	Emissions calculated based on animal population data and appropriate EFs
4B	Emissions calculated based on animal population data and appropriate EFs
4D	IPCC recommended methodology
4F	Emissions calculated based on IPCC methodologies and USEPA EFs
5	Spreadsheet model to estimate emissions from LULUCF
6	IPCC recommended methodologies and LQM Solid Waste Disposal model

The sources of data used are documented in the relevant sections of the NIR though much of the activity data are taken from the key publications listed in [Table 5.2](#) below. All sources are updated annually.

Table 5.2: Key UK activity data used to estimate greenhouse gas emissions

Source (and publisher)	Relevant activity data contained in the source
Digest of UK Energy Statistics (UK Department for Trade and Industry)	<ul style="list-style-type: none"> • Energy statistics for the UK (imports, exports, production, consumption, demand) of liquid, solid and gaseous fuels • Calorific values of fuels and conversion factors
Transport Statistics GB (UK Department for Transport)	<ul style="list-style-type: none"> • Vehicle km according to vehicle type and road type • Vehicle licensing statistics (split in vehicle km by fuel type) • Selected domestic and international civil aviation aircraft km flown
Northern Ireland Department of the Environment	<ul style="list-style-type: none"> • Traffic count and vehicle km data for Northern Ireland • Information on regulated processes in NI
Civil Aviation Authority	<ul style="list-style-type: none"> • Detailed domestic and international civil aviation aircraft km flown
Pollution Inventory (Environment Agency)	<ul style="list-style-type: none"> • Information on emissions from regulated processes in England and Wales
Scottish Environment Protection Agency	<ul style="list-style-type: none"> • Information on regulated processes in Scotland
United Kingdom Petroleum Industry Association	<ul style="list-style-type: none"> • Refinery emissions, • Lead and sulphur contents of fuels, benzene content of petrol, RVP of petrol
United Kingdom Offshore Operators Association	<ul style="list-style-type: none"> • Detailed inventory of oil & gas emissions
Iron and Steel Statistics Bureau	<ul style="list-style-type: none"> • Energy production and consumption in the Iron and Steel industry • Other statistics regarding the Iron and Steel industry
United Kingdom Minerals Yearbook (British Geological Society)	<ul style="list-style-type: none"> • Statistical data on minerals production, consumption and trade
Annual Abstract of Statistics (Office for National Statistics)	<ul style="list-style-type: none"> • Population data

Where up-to-date activity data are not available, provisional emission estimates are prepared by extrapolation of the most recent activity data.

5.7.4 Uncertainty assessment

Estimates of uncertainties are prepared according to both the Tier 1 and Tier 2 procedures described by the IPCC. The Tier 1 approach provides estimates of

uncertainties by pollutant according to IPCC sector. The Tier 2 approach provides estimates according to GHG (1990, base year and latest reporting year) and has now been extended to provide emissions by IPCC sector.

A full description of the uncertainty analysis is presented in Annex 7 of the NIR.

5.7.5 Key source categories

Key sources are defined as the sources of emissions that have a significant influence on the inventory as a whole, in terms of the absolute level of the emissions, the trend, or both. A ranking exercise is performed according to IPCC Tier 1 Level analysis and Trend analysis to identify key source categories, so that the resources available for inventory preparation may be prioritised, and the best possible estimates prepared for the most significant source categories.

The method used is as described within Section 7.2 of the IPCC Good Practice Guidance (2000) (Determining national key source categories) and the results are presented within the NIR, summarizing key source categories by sector and gas, indicating whether a key source arises from the level assessment or the trend assessment. The factors that make a source a key source are:

- A high contribution to the total
- A high contribution to the trend
- High uncertainty

For example, in the 2004 greenhouse gas inventory, presented in the 2006 NIR, the UK transport fuel (1A3b) is a key source for carbon dioxide because it is large; landfill methane (6A) is key because it is large, has a high uncertainty and shows a significant trend.

5.7.6 Recalculations

Where an improvement to a methodology or data source is identified and has a substantial impact on the estimates, the historic emissions are recalculated in order that a consistent time-series of emission estimates is presented within the inventory. This is consistent with the recommended approach to recalculations, as outlined within Chapter 7 of the IPCC Good Practice Guidance. It is recommended good practice to recalculate historic emissions when methods are altered or improved, when new source categories are included or when errors in existing estimates are identified and corrected.

5.7.7 Reporting

Estimates of emissions are prepared for the various reporting formats (e.g. IPCC, UNECE etc.). Draft reports are written to satisfy the reporting criteria of the various agencies, e.g. the UNFCCC. The reports are reviewed: internally within Netcen; by external contributing agencies; and by Defra. Any errors or omissions

that these reviews identify are rectified. Final reports and data sets are prepared and submitted to the EUMM and the UNFCCC.

5.7.8 Internal and peer review

A series of internal reviews within AEA are carried out to detect any anomalies in the estimates (time series variations and year to year changes) which are then rectified. In 2002, the UK implemented a programme of external peer review for key source categories. To date, two peer reviews have been completed – CO₂ from fuel combustion and emissions from agriculture. Further reviews are planned. Recommendations from these reviews are used to help improve sectoral emissions estimates.

5.7.9 National system website

All inventory information, including the published National Inventory Report (NIR) and Common Reporting Format (CRF) tables, is available on the UK national system website at: www.ghgi.org.uk

5.8 Archiving

At the end of each reporting cycle, all the database files, spreadsheets, on-line manual, electronic source data, paper source data, output files are frozen and archived. An annual report outlining the methodology of the inventory and data sources is produced. Electronic information is stored on hard disks that are regularly backed up. Paper information is archived in a Lektreiver[®] system and there is a simple database of all items in the archive. These archived materials are available to inventory auditors, reviewers and other stakeholders upon request, with printed materials archived at AEA offices in Oxfordshire.

5.9 Article 8 reviews

Expert reviews have so far been conducted under the UNFCCC but reviews under the Kyoto Protocol (Article 8) will occur in the future. The UK has found the experience of expert reviews under the UNFCCC to be mutually beneficial. We anticipate that this will continue under Art 8 reviews. We provide review teams with full access to all documentation and database records underlying the national inventory. Netcen responds quickly and in detail to questions raised by the team both during and after the review. Netcen analyses the recommendations of review teams and suggests how each recommendation will be taken forward in the development of the national inventory.

5.10 Verification

CESA funds two linked contracts undertaking research to assist the UK in verifying its greenhouse gas inventory estimates. The main long term measurement contract is with International Science Consultants (Inscon) who collect data on atmospheric concentrations of the main greenhouse gases from a clean air site on the West Coast of Ireland at Mace Head. The interpretation of

this data is carried out by the UK Meteorological Office who employ a Lagrangian dispersion model NAME (Numerical Atmospheric dispersion Modelling Environment) to sort the observations made at Mace Head into those that represent northern hemisphere baseline air masses and those that represent regionally-polluted air masses arriving from Europe. The output from the dispersion model and an inversion algorithm are then used to estimate the magnitude and spatial distribution of the European emissions that best support the observations. The estimates of emissions from this inverse modelling are then compared against emission estimates in the GHG inventory. Trends, similarities and differences between the model and inventory estimates are examined and the latter help determine whether improvements are needed in the inventory, modelling approach or both.

6. Description of the UK's national registry

The description of the UK's national registry is undertaken in accordance with the guidelines set down in Decision 15/CMP.1.

6.1 Contact details

Title	Registry Administrator
Name	Environment Agency of England and Wales
Address	Emissions Trading Richard Fairclough House Knutsford Road Warrington WA4 1HG UK
Email	etregistryhelp@environment-agency.gov.uk
Website	www.environment-agency.gov.uk

6.2 Consolidated registry systems

The UK National Registry is currently linked to the other operational EU member states' National Registries by way of the European Commission CITL (Community Independent Transaction Log).

The Environment Agency of England and Wales is the UK registry administrator and the designated registry administrator for a number of regional regulators and devolved authorities. Therefore the UK National Registry contains accounts of operators located in the following jurisdictions: Scottish Environment Protection Agency, Department of Environment Northern Ireland, National Assembly for Wales, the Department of Trade & Industry (UK offshore installations) and the Government of Gibraltar.

6.3 Database structure and capacity

The UK registry system is implemented using a Microsoft SQL Server relational database management system with a dedicated data model for supporting registry operations. The current IT software supplier is Siemens under contract to Defra.

The current architecture in place for the UK registry system is a single stripe server with SQL Server 2000 installed. A Microsoft SQL Server 2000 failover clustering environment will be in place by the time the database connects to the ITL (International Transaction Log). This will add increased resilience and reliability to the database. The servers in both the single stripe and clustering environments also have resilient RAID disk configurations that offer increased performance and fault tolerance. Cisco PIX 525 firewalls are also installed for secure working.

The architecture installed has been sized to include the scalability to handle an increase of 50% in UK transactions in each subsequent year (since May 2005 the registry has processed just over 5000 transactions).

In the event that a particular performance issue is identified, we have a development team available through a support contract with the current IT supplier to perform any necessary fine-tuning as required.

6.4 Compliance with ITL data exchange standards

The UK registry has been developed for the EU Emissions Trading Scheme. This scheme requires its Member States' registries to be compliant with the UN Data Exchange Standards (DES) specified for the Kyoto Protocol.

The system contains the functionality to perform issuance, conversion, external transfer, (voluntary) cancellation, retirement and Reconciliation processes using XML messages and web-services as specified in V1.0 of the UN DES document.

In addition, it also contains: 24 Hour Clean-up, Transaction Status enquiry, Time Synchronisation, Data Logging requirements (including, Transaction Log, Reconciliation Log, Internal Audit Log and Message Archive) and the different identifier formats as specified in the UN DES document.

The registry development team have been in close contact with the ITL administrator and development team within the UNFCCC secretariat. Discussions have been held regarding the potential implementation timescales for the remaining functions. All functionality that has yet to be developed will be completed in line with the ITL timetable and the UNFCCC will be updated wherever necessary.

6.5 Procedures to minimise discrepancies and terminate transactions

In order to minimise discrepancies between the Registry and the Transaction Log, the following approach has been adopted for the Registry system development for the EU Emissions Trading Scheme. The same approach will be adopted for the development of the remaining Kyoto functionality for the Registry software:

1. Communications between the National Registry and the ITL will be via web-services using XML messages – as specified in the UN DES document. These web-services, XML message format and the processing sequence will be as per that specified in the UN DES document;
2. As far as possible, the Registry shall validate data entries against the list of checks that are performed by the ITL – as documented in Annex E of the UN DES Annexes document – before forwarding the request to the ITL for

processing. This will help to minimize sending incorrect information to the ITL for approval;

3. All units that are involved in a transaction shall be earmarked internally within the Registry; thereby preventing the units from being involved in another transaction until a response has been received from the ITL and the current transaction has been completed;
4. The web-service that sends the message to the ITL for processing will ensure that a message received acknowledgement is received from the ITL before completing the submission of the message. Where no acknowledgement message has been received following a number of retries, the web-service will terminate the submission and roll-back any changes made to the unit blocks that were involved;
5. Where a 24 hour clean-up message is received from the ITL, the existing web-service will roll back any pending transactions and the units that were involved, thereby preventing any discrepancies in the unit blocks between the Registry and the ITL; and
6. Finally, if an unforeseen failure were to occur, the data discrepancies between our Registry and the ITL can be corrected via a manual intervention function within our registry. Following this, reconciliation will be performed to validate that the data are synchronised between the Registry and the ITL.

6.6 Security measures to prevent unauthorised manipulations and operator error

The UK Registry contains the following security measures:

- a. Access is via Username and Password, as set out in the EU Registry Regulations;
- b. User authentication is further strengthened by digital certificate access;
- c. The actions that a user can perform are controlled by a permissions system, hence preventing unauthorised access to restricted actions;
- d. All actions performed are recorded by audit;
- e. Database manipulations are only carried out by protected, internal stored procedures which are not accessible directly from the user interface and can only be invoked by our internal web-services; and
- f. A development team is available through the support contract with the current IT supplier to make any further security enhancements as and when required.

In order to prevent operator errors, our Registry software incorporates the following design:

- i. Validation is performed on all user inputs to ensure that only valid details are submitted for processing;
- ii. Confirmation of user input is displayed to help the user to spot any errors that may have been made; and
- iii. An internal approval process has been implemented for secondary approval for relevant operations before submitting the details to the ITL for processing.

6.7 A list of the information publicly accessible through the user interface to the national registry

- a. User details – unchanged, updated, created
- b. Account details – unchanged, updated, created
- c. Operator holding account – unchanged, updated, created

Publicly accessible information required under 5/CMP.1, 13/CMP.1 and 14/CMP.1 will be included in a future release of the software in order to meet with the timetable required for Kyoto. These reports will be displayed publicly in addition to the reports described above and will most likely be available from the same location.

6.8 How to access information through the user interface of the national registry

All publicly accessible information is available from the homepage of the registry itself. To access this, open Internet Explorer (or similar) and browse to the following URL: <http://emissionsregistry.gov.uk> (this is the registry homepage) and click on the public reports link. The user can then choose to view a report from the list described in section 6.7 above.

6.9 Measures to safeguard, maintain and recover data in the event of a disaster

The servers that host the registry are in a physically secure data centre with 24/7/365 on site guards, CCTV system and access control system. All data centres are fitted with smoke detection and automatic fire suppression systems.

At the time of implementation of the infrastructure an independent Penetration Test was carried out successfully with no major issues identified.

Anti-virus software upgrades are downloaded and installed autonomously on to the servers as soon as they are released.

The registry is monitored on a 24 hour basis using industry standard monitoring tools such as MOM and Big Brother with reports being produced for any incidents.

A full backup of each database and an hourly transaction log backup during business hours takes place every day with the back-up media being held at an off site third party secure storage facility. The database content will also be replicated at a minimum of 30 minute intervals to a secondary data centre location when the clustering environment is implemented. This will serve as the hosting platform for Disaster Recovery.

In the event of a disaster a decision will be taken (between the Environment Agency and the IT contract supplier) to invoke disaster recovery. This will involve:

- Stopping all transactions to the main platform.
- Ensuring that the committed transactions are replicated to the DR site.
- Switching all external interaction with the main site over to the secondary location through the use of DNS based redirection.

The IT contract supplier is committed to resuming the service for the UK operators within 8 hours of the decision being made.

6.10 Results of previous test procedures

A full regression test of the registry was performed by the IT contract supplier in July 2006. The test scripts and results are available on request from the Environment Agency.

6.11 How the registry performs the functions defined in 13/CMP.1

Provisions governing t/ICERs. The required functionality to deal with t/ICERs is currently being developed according to the UN timetable.

Publicly accessible information. Public reports will be built along with the rest of the UN functionality and will be developed according to the UN timetable.

6.12 How the registry performs the functions defined in 5/CMP.1

Issuance of ERUs, AAUs & RMUs. Information will be transmitted to the ITL in the format of the messages specified in the UN DES V1.0. Any functionality that has yet to be built will be developed according to the UN timetable.

Transfer, acquisition, cancellation, retirement & carry-over. Information will be transmitted to other registries in the format of the messages specified in the UN

DES V1.0 via the ITL. Acknowledgement information will be transmitted to other registries in the format of the messages specified in the UN DES V1.0 via the ITL. Any functionality that has yet to be built will be developed according to the UN timetable.

Transaction procedures. Will be carried out as specified in the UN DES V1.0. Any functionality that has yet to be built will be developed according to the UN timetable.

Publicly accessible information. Publicly available reports will be developed according to the UN timetable.

6.13 The Standard Electronic Reporting Format (14/CMP.1)

The SEF reports will contain the information as set out in Decision 14/CMP.1 and will be built according to the ITL timetable.

Annex 1

Cross-referencing Decision 13/CMP.1 with UK information sources

Annex to Decision 13/CMP.1	Decision Text	Sources of UK information
	Part One	
Para 7(a)	Complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for all years from 1990, or another approved base year or period under Article 3, paragraph 5, to the most recent year available, prepared in accordance with Article 5, paragraph 2, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP), taking into account any relevant decisions of the Conference of the Parties	<ul style="list-style-type: none"> • UK NIR 2006 (Issue 2) submitted to UNFCCC on 9 October 2006 • UK CRF submitted to UNFCCC on 28 September 2006 • UK's Initial Report, Part One, Section 2
Para 7(b)	Identification of its selected base year for HFCs, PFCs, SF ₆ in accordance with Article 3, paragraph 8	<ul style="list-style-type: none"> • UK's Initial Report, Part One, Section 2
Para 7(c)	The agreement under Article 4, where the Party has reached such an agreement to fulfil its commitments under Article 3 jointly with other Parties	<ul style="list-style-type: none"> • Decision 2002/358/EC concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder (<i>Official Journal L 130 , 15/05/2002 P. 0001 - 0003.</i>)
Para 7(d)	Calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, on the basis of its inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol	<ul style="list-style-type: none"> • UK's Initial Report, Part One, Section 2
	Part Two	

Annex to Decision 13/CMP.1	Decision Text	Sources of UK information
Para 8(a)	Calculation of its commitment period reserve in accordance with decision 11/CMP.1	<ul style="list-style-type: none"> • UK's Initial Report, Part Two, Section 3
Para 8(b)	Identification of its selection of single minimum values for tree crown cover, land area and tree height for use in accounting for its activities under Article 3, paragraphs 3 and 4, together with a justification of the consistency of those values with the information that has been historically reported to the FAO of the UN or other international bodies, and in the case of difference, explanation of why and how such values were chosen, in accordance with decision 16/CMP.1	<ul style="list-style-type: none"> • UK's Initial Report, Part Two, Section 4
Para 8(c)	Identification of its election of activities under Article 3, paragraph 4, for inclusion in its accounting for the first commitment period, together with information on how its national system under Article 5, paragraph 1, will identify land areas associated with the activities, in accordance with decision 16/CMP.1	<ul style="list-style-type: none"> • UK's Initial Report, Part Two, Section 4
Para 8(d)	Identification of whether, for each activity under Article 3, paragraphs 3 and 4, it intends to account annually or for the entire commitment period	<ul style="list-style-type: none"> • UK's Initial Report, Part Two, Section 4
Para 8(e)	Description of its national system in accordance with Article 5, paragraph 1, reported in accordance with the guidelines for the preparation of information required under Article 7 of the Kyoto Protocol	<ul style="list-style-type: none"> • UK NIR 2006 (Issue 2) submitted to UNFCCC on 9 October 2006 • UK's Initial Report, Part Two, Section 5
Para 8(f)	Description of its national registry, reported in accordance with the guidelines for the preparation of information required under Article 7 of the Kyoto Protocol	<ul style="list-style-type: none"> • UK's Initial Report, Part Two, Section 6

Annex 2

UK NIR and CRF submissions to UNFCCC in 2006

Version	Date of submission	Reason for submission
UK NIR 2006 Issue 1	15 April 2006	To fulfil UK GHG inventory reporting obligation to UNFCCC
UK CRF tables 1990 to 2004, Version 1.1	15 April 2006	To fulfil UK GHG inventory reporting obligation to UNFCCC
UK CRF tables 1990 to 2004, Version 2.1	28 July 2006	To update UK emissions, and ensure base year as complete as possible, to take account of: <ul style="list-style-type: none"> • The decision of Gibraltar to join the UK's instruments of ratification of the UNFCCC and Kyoto Protocol • Revised estimates of methane emissions from landfill, following a reassessment by the UK of the evidence on landfill emissions in the light of a UNFCCC review of the UK inventory conducted in 2005 and other emerging evidence from UK sponsored research into atmospheric concentrations of methane attributable to the UK.
UK CRF tables 1990 to 2004, Version 3.3	25 September 2006	To resolve a 70 tonne CO ₂ discrepancy in total GHG emissions; and to ensure that data contained in NIR tables matches exactly the totals provided in CRF tables.
UK NIR 2006 Issue 2	9 October 2006	To provide an up-dated NIR incorporating all the changes as described above.

Annex 3

Roles and responsibilities in UK national system

Organisation	Roles in relation to the National Inventory	Responsibilities
Defra – Climate, Energy, Science and Analysis (CESA) Division	<ul style="list-style-type: none"> Administer functions of Single National Entity for national system Overall responsibility for inventory development, compilation and reporting Manage GHG research contracts Provide Secretariat to Steering Committee 	<p>Ensure that UK GHG inventory conforms to international standards, and is submitted on time to EU and UN each year</p> <p>Ensure that LULUCF inventory conforms to international standards and is submitted on time to AEA Energy and Environment each year</p>
Defra – National Climate Change Policy (NCCP) Division	<ul style="list-style-type: none"> Provide links with UK Climate Change Programme developments Responsible for overseas territories Provide fuel use and fuel characterisation datasets from the EU-ETS for use by both DTI and the GHGI in the determination of industrial fuel use statistics and emissions of GHGs from combustion sources. 	Management of the UK's Climate Change Programme, including overseas territories and maintenance and reporting of the EU Emissions Trading Scheme database of fuel use and emission estimates
Defra – Sustainable Food and Farming Strategy (SFFS) Division	<ul style="list-style-type: none"> Manage agricultural inventory research contract 	Ensure that agriculture inventory conforms to international standards and is submitted on time to AEA Energy and Environment each year
Defra – Environmental Statistics and Indicators (ESI) Division	<ul style="list-style-type: none"> Provide statistical check of emissions data used to derive climate change indicators 	Responsible for preparation and release of Defra climate change statistics and indicators each year
Department for Trade and Industry (DTI) – Energy Markets Unit	<ul style="list-style-type: none"> Ensure that energy statistics are presented in the required format and timescale for inventory estimation and reporting 	Responsible for publication of Digest of UK Energy Statistics each year
Department for Trade and Industry (DTI) – Offshore Regulator	<ul style="list-style-type: none"> Ensure that the offshore oil & gas industry (via the trade association, UKOOA) produces annual activity and emissions data in the required format and 	Regulation of the offshore oil & gas industry, including management of the EEMS reporting system of environmental emissions from

Organisation	Roles in relation to the National Inventory	Responsibilities
	timescale for inventory estimation and reporting	that sector
Department for Transport (DfT)	<ul style="list-style-type: none"> • Ensure that transport statistics are presented in the required format and timescale for inventory estimation and reporting 	Responsible for publication of transport statistics each year
Department for Communities and Local Government (DCLG)	<ul style="list-style-type: none"> • Ensure that housing statistics are presented in the required format and timescale for inventory estimation and reporting 	Responsible for publication of housing statistics each year
Environment Agency for England and Wales; Scottish Environment Protection Agency; Environment and Heritage Service in Northern Ireland	<ul style="list-style-type: none"> • Ensure that the pollutant emission inventories for industrial processes regulated under IPC/IPPC (PI, SPRI, ISR) are presented in the required format and timescale for inventory estimation and reporting • Collate information in annual emissions reports for EU ETS 	Responsible for the management, compilation, QAQC and reporting of pollutant emission inventories / registers under IPPC regulations, and EU ETS annual emission reporting.
Devolved Administrations (Scotland, Wales and Northern Ireland)	<ul style="list-style-type: none"> • Review aspects of the UK GHG inventory that correspond to devolved issues, ensuring the integration of local datasets and specific research where appropriate 	General review function for completeness and accuracy of inventory from devolved perspective

Annex 4

Inventory Quality Assurance/ Quality Control Programme

1. Documentation

Data received by AEA Energy and Environment are logged, numbered and traceable back to their source from anywhere in the system. The inventory is held as a database of activity data and emission factors.

Within the database these data fields are referenced to the data sources, or the spreadsheet used to calculate the data. The system defines timetables, procedures for updating the database, document control, checking procedures and procedures for documenting methods used to estimate emissions.

Records are kept of the choice of methodology and emission factor used, the rationale for these choices, and activity data sources. An annual report outlining the methodology of the inventory, data sources and changes made is produced.

2. Database

The classification of source categories is controlled by a formatting table in the database, which is used to generate emissions tabulated in the IPCC format. Other simple queries can be used to extract all emissions data contained in the database. These can be compared against the tabulated output to check that all sources are output and that the totals are correct.

A consistency check between IPCC output and CORINAIR formatted output is made. Data in the CRF reporting tool are checked against the database totals.

All fields in the database are labelled automatically with an NAEI activity/fuel category, the CORINAIR SNAP code and the units used. A comment field linked to each data entry provides further description and the data source or spreadsheet used to calculate it.

3. Checking

AEA's QA/QC system requires that spreadsheet calculations are checked and the checks applied are described. The data sources used for calculations must be referenced on the spreadsheet. Data entry into the database is checked in a majority of cases by a second person.

A system has been developed to check the fuel entries in the database. Queries will abstract and total the fuel consumptions for each fuel. These totals are then checked against the totals reported in the DTI publication DUKES.

The final checks on the inventory involve a consistency check against the previous inventory for the same year. A designated auditor identifies sources

where there have been significant changes or new sources. Inventory staff are required to explain these changes in the inventory to satisfy the auditor.

A further final check is made on the inventory comparing the emissions of the latest year with those of the previous year (within the same version). A designated checker identifies sources where there have been significant changes. Inventory staff are required to explain these changes in the inventory to satisfy the checker. This is more detailed than the recalculation explanations required by Table 8 in the CRF, because it is based on the more disaggregated source sectors used in the NAEI database.

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