

# Summary of differences between geographical coverages of reported GHG emissions

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# Executive summary

## Overview

This report presents a summary of similarities and differences between three important data sets of GHG emissions that are generated by the Department of Energy and Climate Change (DECC):

- UK GHG inventory
- Devolved Administration inventory
- LA CO<sub>2</sub> inventory developed for the NI186 indicator
- mapped emissions at the 1 km scale
- ONS Air Accounts work

This report summarises the geographical coverages of the emissions presented in the reports, the methods used to estimate the emissions, the nomenclature used to report emissions, and the locations of the latest reports.

This report does not catalogue all the sets of GHG emissions reported in the UK.

The report is the deliverable for Task 105 in the NAEI 2008 to 2001 work programme “*Produce a report summarising the differences in the emission totals between GHG inventories produced at 3 geographical scales: national, devolved administration, and local authority*”.

Each inventory is summarised in a separate chapter. **Appendix 1** lists the dependencies and territories included in the UK GHG inventory. **Appendix 2** summarises of the characteristics of UK GHG inventories.

## Locations of data sets in the public domain

**Table A2-1** in **Appendix 2** lists the locations of GHG reports and data sets in the public domain on the web.

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## Document revision history

Revision history		
Issue	Version	Revision history
<b>Draft</b>		<ul style="list-style-type: none"><li>Reviewed internally</li></ul>
<b>1.0</b>		<ul style="list-style-type: none"><li>First issue</li></ul>
<b>2.0</b>		<ul style="list-style-type: none"><li>Modified to incorporate comments from DECC</li></ul>

## Units and conversions

Emissions of greenhouse gases presented in this report are given in Million tonnes (Mt) and kilotonnes (kt). To convert between the units of emissions, use the conversion factors given below.

<b>Prefixes and multiplication factors</b>			
Multiplication factor	Abbreviation	Prefix	Symbol
1,000,000,000,000,000	$10^{15}$	peta	P
1,000,000,000,000	$10^{12}$	tera	T
1,000,000,000	$10^9$	giga	G
1,000,000	$10^6$	mega	M
1,000	$10^3$	kilo	k
100	$10^2$	hecto	h
10	$10^1$	deca	da
0.1	$10^{-1}$	deci	d
0.01	$10^{-2}$	centi	c
0.001	$10^{-3}$	milli	m
0.000,001	$10^{-6}$	micro	$\mu$

1 kilotonne (kt)	=	$10^3$ tonnes	=	1,000 tonnes
1 Million tonne (Mt)	=	$10^6$ tonnes	=	1,000,000 tonnes
1 Gigagramme (Gg)	=	1 kt		
1 Teragramme (Tg)	=	1 Mt		

### Conversion of carbon emitted to carbon dioxide emitted

To convert emissions expressed in weight of carbon, to emissions in weight of carbon dioxide, multiply by 44/12.

## Abbreviations for greenhouse gases and chemical compounds

Abbreviations		
Type of greenhouse gas	Formula or abbreviation	Name
Direct	CH <sub>4</sub>	Methane
Direct	CO <sub>2</sub>	Carbon dioxide
Direct	N <sub>2</sub> O	Nitrous oxide
Direct	HFCs	Hydrofluorocarbons
Direct	PFCs	Perfluorocarbons
Direct	SF <sub>6</sub>	Sulphur hexafluoride
Indirect	CO	Carbon monoxide
Indirect	NMVOG	Non-methane volatile organic compound
Indirect	NO <sub>x</sub>	Nitrogen oxides (reported as nitrogen dioxide)
Indirect	SO <sub>2</sub>	Sulphur oxides (reported as sulphur dioxide)

HFCs, PFCs and SF<sub>6</sub> are collectively known as the 'F-gases'

## Abbreviations, acronyms and definitions

AEA	AEA group <a href="http://www.aeat.co.uk">www.aeat.co.uk</a>
BERR	UK Department of Trade and Industry
CD	Crown Dependency
CORINAIR SNAP	nomenclature (Selected Nomenclature for sources of Air Pollution).
CRF	Common Reporting Format tables of emissions for submission to the FCCC
DA	Devolved Administration
DECC	Department for Energy and Climate Change
Defra	Department for Environment Food and Rural Affairs
DfT	Department for Transport
DUKES	Digest of United Kingdom Energy Statistics <a href="http://www.dti.gov.uk/energy/statistics">www.dti.gov.uk/energy/statistics</a>
EA	Environment Agency for England and Wales
EC	European Commission
EU ETS	European Union Emissions Trading Scheme
EU	European Union
FCCC	Framework Convention on Climate Change
GHG	Greenhouse gas
GHGI	Greenhouse gas inventory
GLs	Guidelines for the compilation of GHG inventories. Published by the IPCC.
GPG	Good Practice Guidance for the compilation of GHG inventories. Published by the IPCC.
kt	kilo tonne
LA	Local Authority
Mt	Mega tonne
NAEI	National Atmospheric Emissions Inventory <a href="http://www.naei.org.uk">www.naei.org.uk</a>
NIR	National Inventory Report
NUTS4	NUTS (Nomenclature of Units for Territorial Statistics) is a hierarchical classification of spatial units that provides a breakdown of the European Union's territory for producing regional statistics which are comparable across the EU. NUTS4 is comparable with Local Authorities and NUTS3 is broadly comparable to Counties or equivalent in the UK.
ONS	Office for National Statistics
OT	Overseas Territory
UK ETS	United Kingdom Emissions Trading Scheme
UK	United Kingdom
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change

# 1 Introduction

This report presents a summary of similarities and differences between three important data sets of GHG emissions that are generated by the Department of Energy and Climate Change (DECC):

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Each inventory is summarised in a separate chapter. Appendix 1 lists the Dependencies and territories included in the UK GHG inventory. Appendix 2 summarises of the characteristics of UK GHG inventories.

## 1.1 Overview of emissions totals

**Table 1.1** summarises the 2006 CO<sub>2</sub> and GHG emissions totals reported using each of the reporting conventions, together with a brief note summarising why the totals are different to the UNFCCC total. The differences can be summarised as arising from two different causes – the geographical coverage, or the sectoral coverage.

The most notably different totals are for NI186 (based on the LA CO<sub>2</sub> Inventory) and the ONS Air Accounts inventory. The NI186 total is much lower than the UK Inventory total, since the sectoral coverage is limited to exclude sources which are outside of the Local Authority’s control, such as some industrial plants that are part of the EU ETS and road transport emissions from motorways. Emissions are calculated on an end user basis, and in some cases are calculated using a different method to the UK inventory. In addition, emissions from the UK Overseas Territories are excluded. The detailed methodology report for the LA CO<sub>2</sub> inventory contains a section which reconciles the LA CO<sub>2</sub> totals with the UK GHGI. Details of where to find this report can be found in Appendix 2.

The ONS Air Accounts include a wider scope of emissions sources than those included in the reported national total to the UNFCCC, but a smaller geographical area (UK only). The Air Accounts include emissions that are reported as memo items to the UNFCCC (international aviation and shipping, CO<sub>2</sub> emissions from biomass) and a correction for cross boundary emissions - emissions generated by UK households and businesses transport and travel abroad, net of emissions generated by non-residents travel and transport in the UK. The totals exclude emissions from Land Use, Land Use Change and Forestry. The emissions totals are reconciled with the UK total in a “Bridging Table,” which is presented in the ONS Environmental Accounts report (see Appendix 2).



**Table 1.1 Summary of emissions totals reported for each publication (Mt CO<sub>2</sub>e)**

<b>Summary of emissions totals</b>					
	Emissions in 2006 - CO <sub>2</sub>	% of UNFCCC total	Emissions in 2006 - GHGs	% of UNFCCC total	Notes and exclusions
National Total submitted to the UNFCCC	555.86	100.0%	653.83	100.0%	Includes all UK Overseas Territories and Crown Dependencies.
National Total submitted to the EUMM	552.88	99.5%	650.37	99.5%	Includes the UK and Gibraltar only
National Total Reported in the Defra statistical digest	554.52	99.8%	652.30	99.8%	Includes the UK and Crown Dependencies, excludes Overseas Territories.
Sum of LA emissions total	531.74	95.7%	NA	NA	Excludes emissions from the OTs. Also excludes domestic aviation and shipping, the final user "export" category, and military aviation and shipping. Emissions are slightly higher than the UK GHGI equivalent for these categories.
Sum of NI186 total	451.31	81.2%	NA	NA	This dataset is based on the LA CO <sub>2</sub> inventory, see the row above. The sectoral coverage of this dataset excludes emissions from sectors which are outside of LA control.
Sum of DA totals	538.85	96.9%	635.53	97.2%	This is the total emission for England, Scotland, Wales and Northern Ireland. Emissions from the offshore oil and gas industry are not allocated to the DAs. If these were to be included, then the total would match exactly with the total in the Defra statistical digest.
ONS Air Accounts	NA	NA	724.46	110.8%	Reported emissions exclude emissions from OTs and CDs and LULUCF, but include emissions that are reported as "Memo Items" to the UNFCCC, i.e. International Bunkers and CO <sub>2</sub> from biomass. A Cross Boundary Adjustment is also included.



## 2 UK GHG inventory

### 2.1 Overview

The United Kingdom's National Inventory Report (NIR) is submitted annually to the United Nations Framework Convention on Climate Change (UNFCCC). It contains national greenhouse gas emission estimates for the period 1990-Year-2 and the descriptions of the methods used to produce the estimates. The report is compiled in accordance with the Inventory Reporting Guidelines agreed by the UNFCCC Conference of Parties at its eighth session (COP8), and set out in document FCCC/CP/2002/8.

The greenhouse gas inventory (GHGI) is based on the same data sets used by the UK in the National Atmospheric Emissions Inventory (NAEI) for reporting atmospheric emissions under other international agreements. The GHGI is therefore consistent with the NAEI where they overlap.

The inventory is compiled on behalf of the UK DECC by AEA, and is updated annually.

### 2.2 Greenhouse gases reported

The six direct GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HCFs, PFCs and SF<sub>6</sub>, and four indirect GHGs: CO, NMVOC, NO<sub>x</sub>, and SO<sub>2</sub>.

### 2.3 Geographical coverage

The geographical coverage of the UK inventory presented in the NIR includes emissions from the UK's Crown Dependencies (CDs) and the UK's Overseas Territories (OTs) who have joined, or are likely to join, the UK's instruments of ratification to the UNFCCC and the Kyoto Protocol.

The UK has two types of associated territories, which are:

- **Crown Dependencies (CDs)**  
The Crown Dependencies are the Isle of Man and the Channel Islands. They are not part of the United Kingdom, and are largely self-governing with their own legislative assemblies and systems of law. The British Government, however, is responsible for their defence and international relations. The Crown Dependencies are not members of the European Union.
- **Overseas Territories (OTs, formerly called Dependent Territories)**  
The Overseas Territories are constitutionally not part of the United Kingdom. They have separate constitutions, and most Overseas Territories have elected governments with varying degrees of responsibilities for domestic matters. The Governor, who is appointed by, and represents, Her Majesty the Queen, retains responsibility for external affairs, internal security, defence, and in most cases the public service. The OTs include the Sovereign Bases (SBs) as a subset.

Up until the 1990-2004 inventory, the UK submitted the same GHG Inventory to both the EUMM and the UNFCCC. Since the 1990-2004 Inventory was used to set the Assigned Amount for both the UK and the EU, it was important to ensure that the geographical coverage was correct. Therefore, for this inventory and subsequent inventories (up until the 1990-2006 inventory), excel spreadsheets or balancing figures in Sector 7 of the CRF have been submitted to the EUMM to allow the calculation of the correct contribution for the UK. From 2009, the UK will submit a separate inventory to the EUMM, including emissions only from the UK and Gibraltar, and excluding all other OTs and CDs that do not form part of the EU. Not all of the UK's Overseas Territories form part of the UK's Instrument of Ratification of the Kyoto Protocol, **Appendix 1** details the status of all of the UK OTs.

The inventory provides data to assess progress with the UK's commitments under the Kyoto Protocol, the UK's contribution to the EU's commitments under the Kyoto Protocol and also progress towards domestic goals to reduce CO<sub>2</sub> emissions. Geographical coverage of these targets differs to some extent, because:

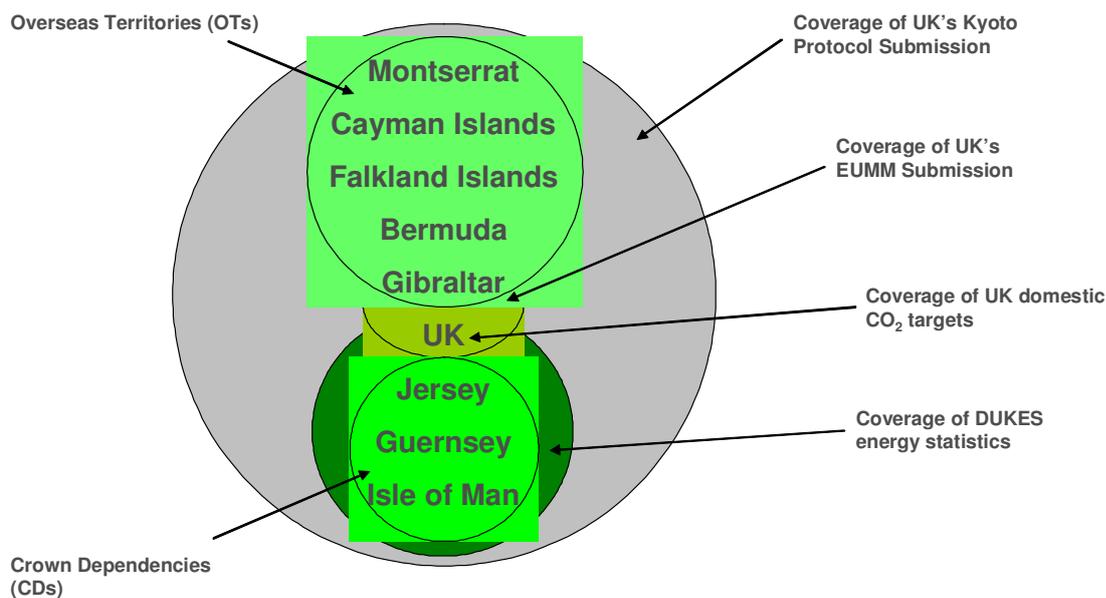
1. Domestic goals for CO<sub>2</sub> include the UK and the Crown Dependencies of Jersey, Guernsey and the Isle of Man;
2. The Kyoto commitment extends coverage also to Overseas Territories that have ratified the Kyoto Protocol (the Cayman Islands, the Falkland Islands, Bermuda, Monserrat and Gibraltar)
3. The UK's contribution to EU emissions includes only the UK and Gibraltar, and excludes all Crown Dependencies and other Overseas Territories.

The Digest of UK Energy Statistics (DUKES) includes energy used in the UK and the Crown Dependencies, which means that historically, emissions associated with fuel consumption in the Crown Dependencies have always been included in the UK inventory. From the 1990-2004 Inventory emissions from non-fuel combustion sources were also estimates, to fully capture all emissions for Coverage 1. Coverage 2 is used for the data in the present CRF tables because of the emerging needs of reporting under the Kyoto Protocol. In the NIR, Tables ES2 and ES3 show CO<sub>2</sub> and the direct greenhouse gases, disaggregated by gas and by sector for geographical coverage 1 and 2. Comparison between the Tables shows that the difference in total emissions and trends between geographical coverage 1 and 2 is small.

In the NIR, Table ES4 has data on indirect greenhouse gas emissions, for geographical coverage 1. Table ES5 shows the Kyoto basket of gases and LULUCF activities for geographical coverage 2. Table ES6 shows total CO<sub>2</sub> emissions by sources minus removals by sinks for geographical coverage 1, which is the time series used relevant to the UK's domestic goals to reduce CO<sub>2</sub>. In the 2009 NIR, an additional ES table has been included to provide emissions consistent with the totals reported under the EUMM.

**Figure 2-1** shows the relationship between the geographical coverages of reporting under the UK GHG inventory. The submission under the Kyoto Protocol has the greatest geographical coverage, and includes the UK, OTs and CDs. The EUMM submission includes Gibraltar. **Table A1-1** in **Appendix 1** provides more detail about which OTs and CDs are included in the submissions.

**Figure 2-1 Relationship between the geographical coverages of reporting under the UK GHG inventory**



## 2.4 Reporting nomenclature

The emissions are reported using the IPCC CRF reporting tables and via the UNFCCC CRF Reporter software.

## 2.5 Methods used to estimate emissions

The GHGI is compiled according to IPCC 1996 Revised Guidelines and Good Practice Guidance (IPCC, 1997; 2000 and 2003). Each year the inventory is updated to include the latest data available. Improvements to the methodology are backdated as necessary to ensure a consistent time series. Methodological changes are made to take account of new data sources, or new guidance from IPCC, relevant work by CORINAIR, and new research, sponsored by DECC or otherwise.

Emissions are reported on a by point of release and end user basis. The UNFCCC only require emissions to be reported on a by point of release basis only. The end user emissions are included to provide information for the UK's National Communications to the UNFCCC and the UK's Climate Change Programme. The difference between by point of release and ends user emission inventories is explained in **Annex 2**.

## 2.6 Sectoral coverage

Emissions in all six IPCC sectors are estimated and reported. Disaggregated emissions are provided in the six sectors: Sector 1, Energy; Sector 2, Industrial Processes; Sector 3; Solvents; Sector 4, Agriculture; Sector 5, Land-use Change and Forestry (LULUCF); Sector 6, Waste.

## 2.7 Time series of emissions reported

In 2008, emissions were reported each year from 1990 to 2006.

## 2.8 Frequency of update

The emissions and report are updated annually.

## 2.9 Location of reports and data

The latest submission of the UK's NIR, background tables of energy data and agricultural information, and the associated detailed CRF tables of emissions can be found at <http://www.ghgi.org.uk/unfccc.html>

See **Table A2-1** "Locations of GHG reports and data sets on the web".

## 3 UK Devolved Administration GHG inventory

### 3.1 Overview

Following devolution, a national UK GHG inventory continues to be necessary to ensure the UK fulfils its reporting requirements under the UNFCCC and to monitor the legally binding commitments under the Kyoto Protocol to reduce greenhouse gas emissions. However, some of the measures to deliver GHG emission reductions are devolved and information on the emissions from the four individual countries is needed to support action in each country.

Defra agreed with the Scottish Government, the Welsh Assembly Government and in Northern Ireland, the Department of the Environment, to carry out a joint research project to provide first estimates of GHG emissions inventories for England, Scotland, Wales and Northern Ireland. The part of Defra that was originally involved in this study now forms part of the newly created Government Department, DECC. The results of this study were published in *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990 and 1995: A Scoping Study, AG Salway et al (1999)*. Subsequently these studies have been updated for 1998 to 2006.

### 3.2 Greenhouse gases reported

The six direct GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HCFs, PFCs and SF<sub>6</sub>.

### 3.3 Geographical coverage

The geographical coverage of the DA inventory includes England, Scotland, Wales and Northern Ireland. Emissions from these countries are presented separately. Emissions from offshore oil and gas installations are accounted as “unallocated” emissions and are reported but not allocated to one of these four constituent countries. The total “unallocated” emissions in 2006 accounts for 2.6% of UK emissions.

The total emissions of the four countries and the unallocated emissions agree with the national total emissions presented in the UK NIR.

UK territorial coverage in this report includes the Crown Dependencies of Jersey, Guernsey and Isle of Man but excludes emissions for those Overseas Territories joining UK instruments of ratification for the UNFCCC and the Kyoto Protocol namely: Cayman Islands, Falkland Islands, Bermuda, Montserrat and Gibraltar.

#### 3.3.1 Crown Dependency data – historic and future use

Emissions from the Crown Dependencies have historically all been allocated to England. The inclusion of the Crown Dependencies within the totals for England has previously been required to ensure consistency with the UK totals. This is because all the UK energy use data presented within the annual DECC publication, the Digest of UK Energy Statistics (DUKES), includes fuel use in the Crown Dependencies. This has meant that it is difficult to disaggregate the CD emissions from the UK totals. For the 1990-2007 Inventories, the database system has been modified to allow explicit reporting of emissions from each of the OTs and CDs.

In future, therefore, it will be possible to exclude the Crown Dependency emission estimates from the England GHG inventory.

### 3.3.2 Breakdown of UK Emissions Data: England, Scotland, Wales, Northern Ireland and Unallocated

All land-based emissions are allocated directly to the appropriate inventory of the constituent countries: England, Scotland, Wales or Northern Ireland.

Emission estimates from national navigation (i.e. coastal shipping, including local ferries, fishing fleets, local port movements by support vessels) and domestic aviation (flights between UK airports) are allocated to the individual countries also. For coastal shipping, the UK emission estimates are split between England, Scotland, Wales and Northern Ireland according to port movement data from the DfT Maritime Statistics. For domestic aviation, the emissions for each flight are allocated to England, Scotland, Wales or Northern Ireland according to the airport of flight origin.

The emission estimates from international shipping and aviation are excluded from the national total in the UK GHG inventory and also from the DA emissions totals. These are reported as “memo items” alongside the UK GHG inventory data in the annual submissions to the UNFCCC. In autumn 2008, for the first time an estimate was made of the approximate share of these “memo item” emissions across England, Scotland, Wales and Northern Ireland.

Emissions from the oil and gas exploration & production offshore industry sector are not allocated to the individual country inventories of England, Scotland, Wales and Northern Ireland. Instead, these are reported within a separate “unallocated” category. The emissions from the onshore elements of this industry sector (mainly from gas and oil terminals) are allocated to the appropriate country inventory.

The most recent GHG Inventory report for the Devolved Administrations shows that the UK distribution of net greenhouse gas emissions (i.e. the sum of emissions and removals) in 2006, expressed in terms of global warming potentials (GWP), is:

- England 77.1%
- Scotland 9.1%
- Wales 7.8%
- Northern Ireland 3.4%
- Unallocated 2.6%

## 3.4 Reporting nomenclature

The emissions are reported using the IPCC CRF reporting tables, with minor modifications. A bespoke data set is also provided in a spreadsheet.

## 3.5 Sectoral coverage

The emissions are reported using the IPCC CRF reporting tables. Disaggregated emissions are provided in the six sectors: Sector 1, Energy; Sector 2, Industrial Processes; Sector 3; Solvents; Sector 4, Agriculture; Sector 5, Land-use Change and Forestry (LULUCF); Sector 6, Waste.

## 3.6 Methods used to estimate emissions

The DA inventory uses data from the main UK inventory, but disaggregates the emissions to the four constituent countries. It uses data reported from industries either in directly to the NAEI team or reported in the pollution inventory to supplement the NAEI data in the UK GHG inventory.

The UK inventory is based on UK statistics for activities producing greenhouse gas emissions. These include fuel consumption, industrial production, agriculture and land use change and forestry. In principle, it would be ideal to obtain a complete set of equivalent statistics for each constituent country to compile each inventory.

Such a set of statistics is not available for all sources and for all constituent countries and hence it is necessary to disaggregate UK emissions into the four constituent countries by an estimation procedure. For most sources in the UK Inventory, the emission of a pollutant from a source is calculated from the general equation:

$$E = Ae \quad \text{[Equation 1]}$$

where

E	=	Emission of pollutant (tonnes)
A	=	Activity (unit activity)
e	=	Emission Factor (tonnes pollutant/unit activity)

The activity unit may be fuel combustion (tonnes), or production of product (tonnes) or numbers of animals.

A modified equation is used in the compilation of the Devolved Administration GHG inventories:

$$E_i = \frac{d_i Ae}{\sum_{j=1}^5 d_j} \quad \text{[Equation 2]}$$

where

$E_i$  = Emission (in tonnes) from either England (1); Scotland (2); Wales (3); Northern Ireland (4); or "Unallocated" (5).

$d_i$  = A driver representing the contribution of the region to UK emissions

$i$  = 1, 2, 3, 4, 5

The driver,  $d_i$  can be any one of:

1. The value of the activity data for the region. [For example, consumption of specific fuels or industrial production figures for the region.]
2. The fraction of the UK activity in the region.
3. The value of a surrogate activity data statistic in the region. Where the required activity is unavailable on a regional basis, a surrogate value may be used. [For example, employment statistics or manufacturing output of a specific product, used as a surrogate for consumption data of a given fuel.]
4. In cases where the emissions are derived from a complex model, the driver will be the actual emission for the region calculated from the model.

Emissions are reported on a by point of release basis only. The difference between by point of release and ends user emission inventories is explained in **Annex 2**.

### 3.7 Time series of emissions reported

In 2008, the DA inventory reported emissions for the years 1990, 1995, and 1998 to 2006.

### 3.8 Frequency of update

The emissions and report are updated annually.

### 3.9 Location of reports and data

The latest submission of the DA inventory and the associated detailed CRF tables of emissions can be found at

<http://www.naei.org.uk/reports.php?list=GHG>

See **Table A2-1** “Locations of GHG reports and data sets on the web”.

## 4 Local and regional CO<sub>2</sub> inventories, and the NI 186 inventory

### 4.1 Overview

Local authorities are becoming increasingly involved in climate change and this involvement includes a number of ad-hoc approaches to measuring greenhouse gas emissions and developing carbon assessment and management programmes for their communities. Through good practice in planning, regulating, campaigning and influencing, Local Authorities can make a significant impact on emissions reduction in residences, businesses and for transport in their community. Setting and monitoring the achievement of comparable targets is an important driver in achieving results.

Over the last two years Defra (now DECC) have commissioned a programme of work to produce carbon estimates for each local authority (LA), to understand the magnitude and spatial variability of carbon emissions in UK LAs. The local CO<sub>2</sub> emissions estimates are underpinned by data contained within the UK greenhouse gas inventory and use maps of emissions developed by the National Atmospheric Emissions Inventory (NAEI) team who compile the official UK emissions inventory. These studies have revealed which sources of carbon within LA boundaries are important, and annual updates to the dataset will reveal which sources are changing in magnitude.

There are two pieces of work which report local and regional CO<sub>2</sub> inventories:

- **Local and Regional CO<sub>2</sub> inventory;** *Local and regional CO<sub>2</sub> emissions*  
This work estimates carbon dioxide emissions for Local Authority (NUTS4) and Government Office Region (NUTS2). This is a national statistic.
- **NI 186 inventory;** *Per capita CO<sub>2</sub> emissions in UK Local Authorities*  
These data are a subset of the main LA CO<sub>2</sub> inventory in the bullet point above. This subset excludes emissions in the main dataset which are considered to fall outside the scope of the indicator (e.g. emissions from motorways and emissions from some installations in the EU Emissions Trading Scheme). This data set has been produced to support the Local government performance framework, and specifically to support National Indicator 186. This indicator is being used to track progress in the percentage reduction of the per capita CO<sub>2</sub> emission in LAs.

### 4.2 Greenhouse gases reported

Only CO<sub>2</sub> is reported in the Local and Regional CO<sub>2</sub> inventory and NI 186 inventory.

### 4.3 Geographical coverage

#### 4.3.1 Local and Regional CO<sub>2</sub> inventory

The geographical coverage is the United Kingdom, with emissions reported at the level of the regions and individual LAs. Emissions from the CDs and OTs are excluded.

The emissions in Local and Regional CO<sub>2</sub> inventory are slightly higher than those in the UK GHG inventory. The technical reasons for this are discussed in the detailed methodology report.

#### 4.3.2 NI 186 CO<sub>2</sub> inventory

The geographical coverage is the United Kingdom, with emissions reported at the level of individual LAs. Emissions from the CDs and OTs are excluded.

The total CO<sub>2</sub> emissions in the NI 186 inventory are much less than those reported in the UK GHG inventory because certain sectors are excluded from the inventory.

## 4.4 Reporting nomenclature

The two sections below refer to the NUTS hierarchy. The UK's NUTS hierarchy is explained in **Appendix 4**.

### 4.4.1 Local and Regional CO<sub>2</sub> inventory

The emissions are reported in bespoke tables, with emissions reported by NUTS4 area and government office region (which is at an individual LA area).

### 4.4.2 NI 186 CO<sub>2</sub> inventory

The emissions are reported in bespoke tables, with emissions reported by NUTS4 area and government office region (which is at an individual LA area).

## 4.5 Sectoral coverage

### 4.5.1 Local and Regional CO<sub>2</sub> inventory

Unlike the national CO<sub>2</sub> estimates, industrial and commercial activities are grouped for the LA emissions estimates because of the nature of the input data – essentially because LA energy and fuel use data produced by BERR (now DECC) groups them together. This means there are fewer sectoral splits available at the LA level than for the national emissions.

Sector	
A. Industry and Commercial Electricity	Q. Domestic Oil
B. Industry and Commercial Gas	R. Domestic Solid fuel
C. Industry and Commercial Large Gas Users	S. Domestic House and Garden Oil
D. Industry and Commercial Oil	T. Domestic Products
F. Industry and Commercial Solid fuel	U. A-Roads Petrol
G. Industry and Commercial Process gases	V. A-Roads Diesel
H. Industry and Commercial Wastes and biofuels	W. Motorways Petrol
I. Industry and Commercial Non fuel	X. Motorways Diesel
J. Industry Offroad	Y. Minor Petrol
K. Diesel Railways	Z. Minor Diesel
L. Agriculture Oil	ZA. Road Transport Other
M. Agriculture Solid fuel	ZB. LULUCF Emissions Soils & Deforestation
N. Agriculture Non fuel	ZC. LULUCF Emissions Other
O. Domestic Electricity	ZD. LULUCF Removals
P. Domestic Gas	

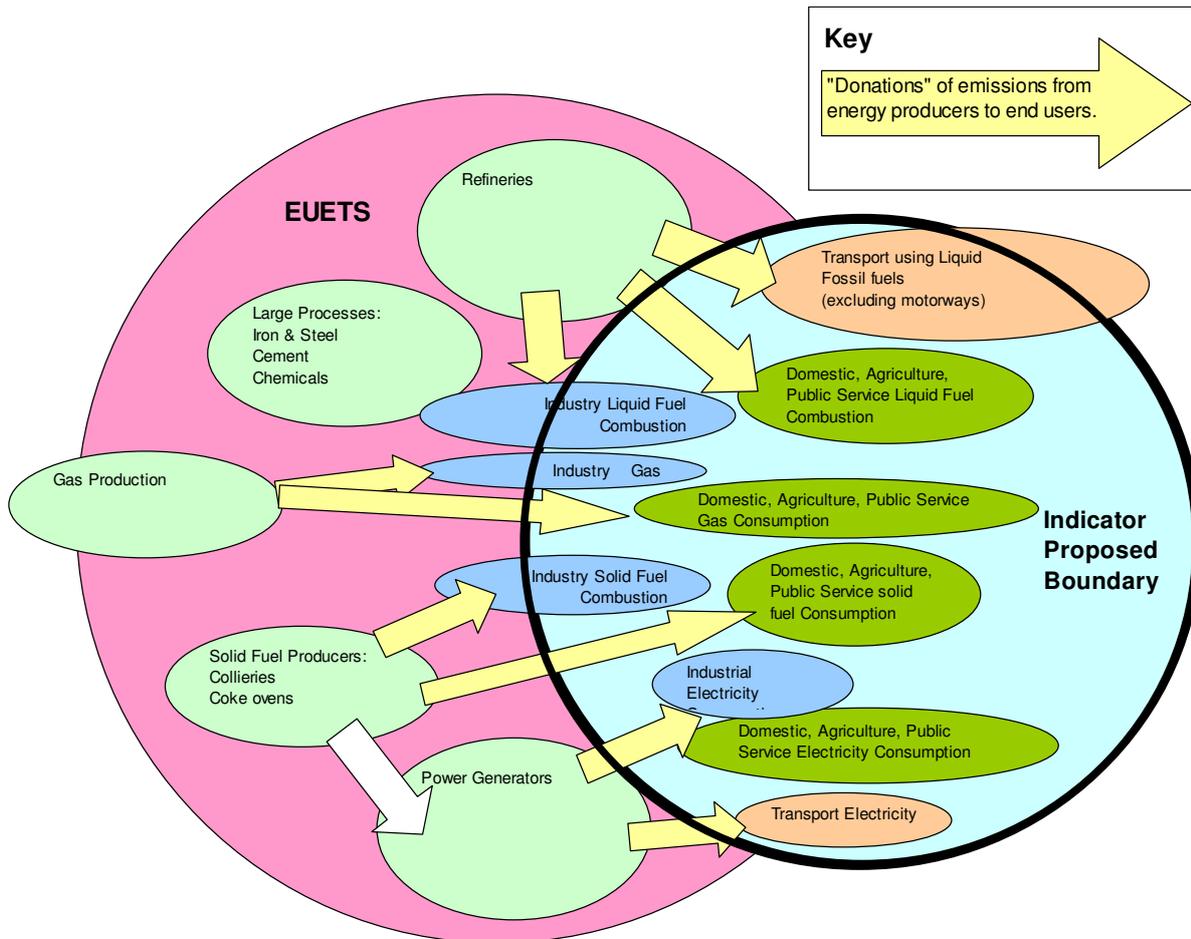
### 4.5.2 NI 186 CO<sub>2</sub> inventory

The NI 186 CO<sub>2</sub> inventory is a subset of the Local and Regional CO<sub>2</sub> inventory.

The sectoral coverage of the NI 186 CO<sub>2</sub> inventory is more limited than the Local and Regional CO<sub>2</sub> inventory because LAs cannot easily control or influence all sources of GHG emissions within their area.

The study excludes direct carbon emissions from installations in the EUETS because these emissions are controlled by national policies. However, emissions from power generation and refining have been included on an end user basis. The difference between by source emission and end user inventories is explained in **Appendix 3**. Road transport emissions on motorways are also excluded. Although LAs can have some influence over travel choices of people living and working within their boundaries, the traffic on motorways is often involved in longer trips which cross LA boundaries. **Figure 4-1** shows the boundaries of emissions in the LA CO<sub>2</sub> indicator.

**Figure 4-1 Scope of sources included in indicator of per capita reduction of CO<sub>2</sub> emissions in the LA area**



Sectors	
A. Industry and Commercial Electricity	O. Domestic Electricity
B. Industry and Commercial Gas	P. Domestic Gas
C. Industry and Commercial Large Gas Users	Q. Domestic Oil
D. Industry and Commercial Oil	R. Domestic Solid fuel
F. Industry and Commercial Solid fuel	S. Domestic House and Garden Oil
G. Industry and Commercial Process gases	T. Domestic Products
H. Industry and Commercial Wastes and biofuels	U. A-Roads Petrol
I. Industry and Commercial Non fuel	V. A-Roads Diesel
J. Industry Offroad	Y. Minor Petrol
L. Agriculture Oil	Z. Minor Diesel
M. Agriculture Solid fuel	ZA. Road Transport Other
N. Agriculture Non fuel	

## 4.6 Methods used to estimate emissions

### 4.6.1 Local and Regional CO<sub>2</sub> inventory

The methodologies used to estimate emissions from this inventory make use of detailed energy data sets that have become available from BERR (DECC). These data sets are energy use (gas and electricity consumption) recorded by meters in properties, although the NAEI team only has access to data aggregated to Local Authorities (NUTS4 level). The methods used to estimate emissions are complex, and the reader is referred to Appendix 2 of the report which summarise the detailed methods used.

The additional spatial disaggregation required for this inventory means some components must be estimated in a different way compared with the methodology used in the national GHG inventory. The following sectors / sub-sectors are estimated differently:

- **Industrial and commercial**
  - electricity use
  - gas use
  - oil and solid fuel use
  - waste
  - agricultural processes and fuel use
  - off road machinery
- **Domestic**
  - electricity use
  - gas use
  - oil and solid fuel use
  - home and garden machinery
- **Transport**
  - road transport
  - railways
- **Land use, land use change, and forestry**

### 4.6.2 NI 186 CO<sub>2</sub> inventory

The NI 186 CO<sub>2</sub> inventory is a subset of the Local and Regional CO<sub>2</sub> inventory. Some emissions are then excluded from the Local and Regional CO<sub>2</sub> inventory National Statistics to produce the figures used to monitor this NI 186 indicator; the emissions excluded are set out in **Section 4.5**.

## 4.7 Time series of emissions reported

### 4.7.1 Local and Regional CO<sub>2</sub> inventory

The emissions in each LA are reported annually, with the time series back calculated to be consistent with the latest methodology.

### 4.7.2 NI 186 CO<sub>2</sub> inventory

The percentage reduction in CO<sub>2</sub> per capita in each LA is reported annually, with the time series back calculated to be consistent with the latest methodology.

## **4.8 Location of reports and data**

### **4.8.1 Local and Regional CO<sub>2</sub> inventory**

See **Table A2-1** “Locations of GHG reports and data sets on the web”.

### **4.8.2 NI 186 CO<sub>2</sub> inventory**

See **Table A2-1** “Locations of GHG reports and data sets on the web”.

## **5 Mapped emissions at the 1 km scale**

### **5.1 Overview**

Emission maps for the whole of the UK are routinely produced as part of the NAEI for 25 pollutants, including CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. The maps are modelled estimates of emissions compiled at a 1 km resolution. One set of maps is produced each year for the most recent NAEI year. The mapped emissions data are made freely available on the NAEI web site.

The emission maps are used by AEA and other organisations for a variety of Government policy support work at the national scale. In particular the maps are used as input into a programme of air pollution modelling studies. Local area statistics are also compiled from the maps and related data since 2003. For example Local Authority level data on carbon dioxide emissions and fuel use have been produced for teams in Defra and BERR (now all part of DECC) using data from the NAEI mapping work. As of March 2008, these datasets were reclassified as National Statistics.

### **5.2 Greenhouse gases reported**

CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

### **5.3 Geographical coverage**

Emissions for Crown Dependencies are not explicitly mapped although prior to the 2007 GHGI emissions have been included in the national mapped estimates, these emissions estimates being effectively distributed throughout the UK mainland based on fuel usage. Overseas Territories joining UK instruments of ratification for the FCCC and the Kyoto Protocol namely: Cayman Islands, Falkland Islands, Bermuda, Montserrat and Gibraltar are not mapped.

### **5.4 Reporting nomenclature**

Emissions are presented as maps on the NAEI website and are also available as tables of data (emissions at 1 km) that can be downloaded. The 1 km datasets area currently is reported using the CORINAIR SNAP nomenclature (Selected Nomenclature for sources of Air Pollution). Migration to compilation using NFR and GNFR codes is planned for the future.

Two sets of CO<sub>2</sub> emissions data are available:

- CO<sub>2</sub> emissions by point of release
- CO<sub>2</sub> emissions by end user.

The emissions of CH<sub>4</sub> and N<sub>2</sub>O are only available by point of release.

### **5.5 Sectoral coverage**

This work generates pollutant-specific gridded emissions by CORINAIR SNAP sectors. Use of NFR and GNFR codes is planned for the future.

#### **5.5.1 CO<sub>2</sub> emissions by point of release**

The analysis aggregates emissions in the following sectors:

- SNAP 01 (Combustion in Energy Production and Transformation)
- SNAP 02 (Combustion in Commercial, Institutional, Residential and Agriculture)

- SNAP 03 (Combustion in Industry)
- SNAP 04 (Production Processes)
- SNAP 05 (Extraction and Distribution of Fossil Fuels)
- SNAP 06 (Solvent Use)
- SNAP 07 (Road Transport)
- SNAP 08 (Other Transport and Mobile machinery)
- SNAP 09 (Waste Treatment and Disposal)
- SNAP 10 (Agriculture, Forestry and Landuse Change)
- SNAP 11 (Nature)

Higher level sub-sectors are available on request. Mapped emissions agree to within a fraction of a percent with those reported in the national total GHGI for (including crown dependencies).

## 5.5.2 CO<sub>2</sub> emissions by end user

The analysis aggregates emissions in the following sectors:

- Industrial and commercial electricity emissions (including agriculture)
- Industrial and commercial gas emissions (including agriculture but not including point sources)
- Other industrial and commercial emissions (solid fuels, oils, process gases and non fuel emissions)
- Industrial off road machinery emissions
- Agricultural emissions including stationary combustion (but not electricity or gas), off road machinery and emissions from the breakdown of pesticides
- Emissions from diesel railways
- Domestic electricity emissions
- Domestic gas emissions
- Domestic oil and solid fuel emissions
- Domestic other emissions (house and garden machinery, household products)
- Road transport emissions (petrol, diesel, other)
- Note that a total emissions grid needs to include emissions from point sources.

**Appendix 3** explains the difference between emissions by source and end user.

## 5.6 Methods used to estimate emissions

The geographical distribution of emissions across the UK is built up from distributions of emissions in each NAEI sector. These individual NAEI sector distributions are developed using a set of statistics appropriate to that sector. For large industrial 'point' sources, emissions are compiled from a variety of official UK sources (Environment Agency, Scottish Environmental Protection Agency, Local Authority data). For sources that are distributed widely across the UK (known as 'area' sources), a distribution map is generated using appropriate surrogate statistics for that sector. The method used for each source sector varies according to the data available.

**Table 5.1** Mapping methods used to map emissions in each of the 11 UNECE source sectors

Sector (data source)	Sector (data source)
<b>1 Combustion in energy production and transfer</b> points offshore IDBR employment	<b>6 Solvent use</b> population points IDBR employment landuse
<b>2 Combustion in commercial, institutions, residential and agricultural sectors</b> points domestic fuel use IDBR employment IDBR agriculture IDBR commercial and public fuel use	<b>7 Road transport</b> road transport
<b>3 Combustion in industry</b> points IDBR employment IDBR industry fuel use	<b>8 Other transport and machinery</b> agriculture airports other rail shipping IDBR employment population
<b>4 Production processes</b> points IDBR employment shipping road transport population other	<b>9 Waste Treatment and disposal</b> landfill landuse offshore points IDBR employment
<b>5 Extraction / Distribution of fossil fuels</b> points offshore other domestic fuel use population	<b>10 Agricultural, forests and landuse change</b> agriculture landuse
	<b>11 Other sources and sinks</b> landuse other population

**Notes**

IDBR Office of National Statistics Inter-Departmental Business Register (IDBR) 2007 which provides data on employment at business unit level by Standard Industrial Classification (SIC) code.

Points A point source is an emission source at a known location such as an industrial plant or a power station. Emissions from point sources may represent sectors of the UK inventory either fully (such as power stations where the sector is made up of large operational facilities for which emission reporting is mandatory) or in part (such as combustion in industry, for which only the large sites within the sector are required to report emissions).

The distribution of emissions presented in the NAEI maps has been verified for key pollutants for use in UK scale air quality modelling. The results for NO<sub>x</sub> show good agreement between the rates of emissions from area sources and background ambient air concentrations at automatic air quality monitoring sites.

## 5.7 Time series of emissions reported

1x1 km gridded emissions data went on the NAEI web site in 2000. Emission maps were first hosted on the NAEI web site in 2001.

## 5.8 Frequency of update

The emissions are updated annually.

## **5.9 Location of reports and data**

See **Table A2-1** “Locations of GHG reports and data sets on the web”.

## 6 ONS Air Accounts

### 6.1 Overview

The Office for National Statistics (ONS) publish environmental accounts providing information on the environmental impact of UK economic activity, and on the importance of natural resources to the economy. The atmospheric emissions and energy accounts are based on data from the National Atmospheric Emissions inventory (NAEI) and UK Greenhouse Gas Inventory (GHGI), with the results adjusted to show emissions of pollutants and energy use by industrial sector. Essentially, this data set is a re aggregation of existing GHG emissions data with some adjustments made for cross boundary transfers, and emissions from Land Use Land Use Change and Forestry are excluded.

### 6.2 Greenhouse gases reported

The six direct GHGs: CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFCs, PFCs, and SF<sub>6</sub>.

### 6.3 Geographical coverage

The emissions include the Crown Dependencies. Overseas Territories are excluded.

### 6.4 Reporting nomenclature

ONS Air Accounts, based on the UK Standard Industrial Classification (SIC).

### 6.5 Methods used to estimate emissions

The ONS Air Accounts is essentially a re-aggregation of existing emissions in the NAEI with cross boundary emissions included for shipping, aviation and road transport added to the totals. These cross boundary adjustments were introduced in the 2000 Account. These adjustments account for cross-boundary transfers, i.e. fuel purchased abroad by UK residents for use in this country, fuel purchased abroad by UK residents for use abroad and fuel purchased in the UK by overseas residents. The rationale behind the adjustment is that the national inventories are primarily based on estimates of the emissions from deliveries and sales of fossil fuels within the 'national territory'. Some sales will be made to overseas residents, while fuels purchased abroad by UK residents may be brought into the UK or consumed abroad. If we want to know who is generating emissions, and how they relate to the production and consumption activities of the UK economy, we need to make a number of adjustments to the territorial/deliveries based inventories as they are currently compiled, taking into account emissions in international sea and air space as well.

### 6.6 Sectoral coverage

The statistics have a similar geographical coverage to the GHG inventory reported to the UNFCCC, with the differences highlighted in the table below.

**Table 6.1 Differences between the ONS Air Account and UK GHG inventory sectoral reporting**

Differences in ONS and UK GHG sectoral coverage		
Source	ONS Air Account	UK GHG inventory
Aircraft - international take off and landing	✓	✗
Aircraft - international cruise	✓	✗
Shipping - international IPCC definition	✓	✗
Shipping - international IPCC definition	✓	✗

Differences in ONS and UK GHG sectoral coverage		
Source	ONS Air Account	UK GHG inventory
Forest Land - Drainage of Organic Soils	x	✓
Forest Land remaining Forest Land	x	✓
Land converted to Forest Land	x	✓
Cropland - Liming Limestone	x	✓
Cropland - Liming Dolomite	x	✓
Cropland remaining Cropland	x	✓
5B2 Deforestation Non-fuel combustion	x	✓
Grassland remaining Grassland	x	✓
Land converted to Grassland	x	✓
Wetlands remaining Wetland	x	✓
Land converted to Wetland	x	✓
Land converted to Cropland	x	✓
Settlements remaining Settlements	x	✓
Land converted to Settlements	x	✓
Other Land remaining Other Land	x	✓
Land converted to Other Land	x	✓
Harvested Wood Products	x	✓

## 6.7 Time series of emissions reported

Emissions from 1990 to the latest GHG inventory year are reported.

## 6.8 Frequency of update

The emissions and report are updated annually.

## 6.9 Location of reports and data

See **Table A2-1** "Locations of GHG reports and data sets on the web".

# Appendices

- Appendix 1 Dependencies and territories included in the UK GHG inventory
- Appendix 2 Summary of the characteristics of UK GHG inventories
- Appendix 3 End / Final user explanation
- Appendix 4 The NUTS spatial hierarchy

# Appendix 1

## Dependencies and territories included in the UK GHG inventory

**Table A1- 1 Details of the dependencies and territories included in the UK GHG inventory**

Coverage of the UK GHG inventory											
Category	Name	Part of British Isles	Part of UK	Part of EU	Presented in NIR	Separate GHG inventory created	Included in EUMM submission	Covered by the UK IoR for the UNFCCC	Covered by the UK IoR for the KP	Include in UNFCCC & KP submission	Notes
CD	Isle of Man	✓			✓	✓		✓	✓	✓	
CD	Channel Islands Baliwick of Jersey Baliwick of Guernsey	✓			✓	✓		✓	✓	✓	
OT	Anguilla										
OT	British Antarctic Territory										
OT	Bermuda				✓	✓		✓	✓	✓	
OT	British Indian Ocean Territory										
OT	British Virgin Islands										
OT	Cayman Islands				✓	✓		✓	✓	✓	
OT	Falkland Islands				✓	✓		✓	✓	✓	
OT	Gibraltar			✓	✓	✓	✓	✓	✓	✓	
OT	Montserrat				✓	✓		✓	✓	✓	
OT	St Helena and Dependencies (Ascension Island and Tristan da Cunha)										
OT	Turk and Caicos Islands										
OT	Pitcairn Island										
OT	South Georgia and South Sandwich Islands										
OT (SB)	Sovereign Base Areas on Cyprus – Akrotiri & Dhekelia										

**Notes**

IoR Instrument of Ratification  
 KP Kyoto Protocol

# Appendix 2

## Summary of the characteristics of UK GHG inventories

Summary of reporting characteristics of GHG emission inventories

Time series of emissions reported in the inventories

Locations of GHG reports and data sets on the web

**Table A2- 1 Summary of reporting characteristics of GHG emission inventories**

Inventory name	Reporting								Geographical coverage			Methodology		Frequency
	UK domestic goal	KP target	Aggregation	Direct GHGs	CO <sub>2</sub> only	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	Indirect GHGs	First reporting date each year	Includes OTs	Includes CDs	Includes Gibraltar	Source or End User	BERR meter point energy data	Frequency of update
UK GHG inventory EUMM			IPCC	✓			✓	15.01			✓	S		Annual
UK GHG inventory UNFCCC	✓	✓	IPCC	✓			✓	15.04	✓	✓	✓	S & EU		Annual
DA inventory			IPCC	✓				30.09		✓		S		Annual
NI186 inventory			bespoke		✓							EU	✓	Annual
L&R CO <sub>2</sub> inventory			bespoke		✓							EU	✓	Annual
1 x 1 mapped emissions			bespoke			✓		30.06				S	✓	Annual
ONS Air Accounts			Air Accounts	✓				Spring		✓		S		Annual

**Notes**

The DA inventory is based on the UK GHG inventory

The UK GHG inventory is reported separately to the European Union Monitoring Mechanism (EUMM) and the Framework Convention on Climate Change (FCCC)

**Appendix 3** explains the difference between source and end user emissions

**Table A2- 2 Time series of emissions reported in the inventories**

Inventory	Year																		
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
UK GHG inventory EUMM																			
UK GHG inventory FCCC					F														
DA inventory										F									
NI186 inventory																			
L&R CO <sub>2</sub> inventory																F			
1 x 1 km mapped emissions											F								
ONS Air Accounts										F									

**Key**

	Consistent time series available
	Time series available but not backdated to be consistent with the latest reported
F or F	First data set issued in this year

**Notes**

Emission maps were first hosted on the NAEI web site in 2001.  
 1x1 km gridded data went on the NAEI web site in 2000.

**Table A2- 3 Locations of GHG reports and data sets on the web**

<b>Locations of GHG reports and data sets</b>			
<b>Inventory</b>	<b>Output</b>	<b>Link on non-NAEI web site</b>	<b>Link on NAEI web site</b>
UK GHG inventory EU	Report	<a href="http://www.ghgi.org.uk/unfccc.html">http://www.ghgi.org.uk/unfccc.html</a>	<a href="http://www.naei.org.uk/reports.php?list=GHG">http://www.naei.org.uk/reports.php?list=GHG</a>
	Data tables	<a href="http://www.ghgi.org.uk/unfccc.html">http://www.ghgi.org.uk/unfccc.html</a>	<a href="http://www.naei.org.uk/reports.php?list=GHG">http://www.naei.org.uk/reports.php?list=GHG</a>
UK GHG inventory FCCC	Report	<a href="http://www.ghgi.org.uk/unfccc.html">http://www.ghgi.org.uk/unfccc.html</a>	<a href="http://www.naei.org.uk/reports.php?list=GHG">http://www.naei.org.uk/reports.php?list=GHG</a>
	Data tables	<a href="http://www.ghgi.org.uk/unfccc.html">http://www.ghgi.org.uk/unfccc.html</a>	<a href="http://www.naei.org.uk/reports.php?list=GHG">http://www.naei.org.uk/reports.php?list=GHG</a>
DA inventory	Report	-	<a href="http://www.naei.org.uk/reports.php?list=GHG">http://www.naei.org.uk/reports.php?list=GHG</a>
	Data tables	-	<a href="http://www.naei.org.uk/reports.php?list=GHG">http://www.naei.org.uk/reports.php?list=GHG</a>
NI186 inventory	Report	<a href="http://www.defra.gov.uk/environment/localgovindicators/ni186.htm">http://www.defra.gov.uk/environment/localgovindicators/ni186.htm</a> <a href="http://www.defra.gov.uk/environment/localgovindicators/documents/ni186-report-2008.pdf">http://www.defra.gov.uk/environment/localgovindicators/documents/ni186-report-2008.pdf</a>	-
	Data tables	<a href="http://www.defra.gov.uk/environment/statistics/globalatmos/download/regionalrpt/local-regionalco2-ni186indicator.xls">http://www.defra.gov.uk/environment/statistics/globalatmos/download/regionalrpt/local-regionalco2-ni186indicator.xls</a>	-
L&R CO <sub>2</sub> inventory	Report	<a href="http://www.defra.gov.uk/environment/statistics/globalatmos/download/regionalrpt/local-regionalco2-methodsumm06.pdf">http://www.defra.gov.uk/environment/statistics/globalatmos/download/regionalrpt/local-regionalco2-methodsumm06.pdf</a> <a href="http://www.defra.gov.uk/environment/statistics/globalatmos/download/regionalrpt/local-regionalco2-report06.pdf">http://www.defra.gov.uk/environment/statistics/globalatmos/download/regionalrpt/local-regionalco2-report06.pdf</a>	-
	Data tables	<a href="http://www.defra.gov.uk/environment/statistics/globalatmos/globallocalghg.htm">http://www.defra.gov.uk/environment/statistics/globalatmos/globallocalghg.htm</a>	-
1 x 1 km mapped CO <sub>2</sub>	Report	-	<a href="http://www.naei.org.uk/report_link.php?report_id=536">http://www.naei.org.uk/report_link.php?report_id=536</a>
	Data tables	-	<a href="http://www.naei.org.uk/mapping/mapping_2006.php">http://www.naei.org.uk/mapping/mapping_2006.php</a>
ONS Air Accounts	Report	-	-
	Data tables	<a href="http://www.statistics.gov.uk/StatBase/Expodata/Spreadsheets/D5695.xls">http://www.statistics.gov.uk/StatBase/Expodata/Spreadsheets/D5695.xls</a>	-



## **Appendix 3**

**End / Final user explanation**

# Final User calculations

The purpose of the end or final user calculations is to allocate emissions from fuel and electricity producers to the energy users - this allows the emission estimates for a consumer of energy to include the emissions from the production of the fuel or electricity they use.

The final user<sup>1</sup> or end user calculations allocate emissions from fuel producers to fuel users. The final user calculation therefore allows estimates to be made of emissions for a consumer of fuel, which also include the emissions from producing the fuel the consumer has used

The emissions included in the final user categories can be illustrated with an example of two final users - the residential sector and road transport:

- ▶ Emissions in the **residential** final user category include:
  1. Direct emissions from domestic premises, for example, from burning gas, coal or oil for space heating.
  2. Emissions from power stations generating the electricity used by domestic consumers; emissions from refineries including refining, storage, flaring and extraction; emissions from coal mines (including emissions due to fuel use in the mining industry itself and fugitive emissions of methane from the mines); and emissions from the extraction, storage and distribution of mains gas.
  
- ▶ Emissions in the **road transport** final user category include:
  1. Direct emissions from motor vehicle exhausts (metals and organic compounds would also be released from brake and tyre wear but these are not relevant to a greenhouse gas inventory).
  2. Emissions refineries producing motor fuels, including refining, storage, flaring and extraction of oil; and from the distribution and supply of motor fuels.

---

<sup>1</sup> A final user is a consumer of fuel for useful energy. A 'fuel producer' is someone who extracts, processes and converts fuels for the end use of final users. Clearly there can be some overlap of these categories but here the fuel uses categories of the UK BERR publication DUKES are used, which enable a distinction to be made.

# **Appendix 4**

## **The NUTS spatial hierarchy**

# NUTS hierarchy

The NUTS (Nomenclature of Units for Territorial Statistics) areas are used by Eurostat, the European Commission’s Statistical Office, for presenting regional and local statistics. It is a hierarchical classification of spatial units that provides a breakdown of the European Union’s territory for producing regional statistics which are comparable across the EU. NUTS4 is comparable with Local Authorities and NUTS3 is broadly comparable to Counties or equivalent in the UK. The NUTS 4 areas in Scotland do not match exactly the Scottish Local Authority Areas therefore a lookup to NUTS3 areas cannot be given.

In the UK, there are five hierarchical levels, built up from local government administrative units as follows:

Level	England	Scotland	Wales	Northern Ireland
NUTS 1	Government Office Regions	Scotland	Wales	Northern Ireland
NUTS 2	Counties or groups of counties	Combinations of council areas, LECs and parts thereof	Groups of unitary authorities	Northern Ireland
NUTS 3	Counties or groups of unitary authorities	Combinations of council areas, LECs and parts thereof	Groups of unitary authorities	Groups of district council areas
LAU 1 (formerly NUTS 4)	Districts or unitary authorities	Combinations of council areas, LECs and parts thereof	Unitary authorities	District council areas
LAU 2 (formerly NUTS 5)	Electoral wards or divisions	Electoral wards or, rarely, parts thereof	Electoral divisions	Electoral wards

Details of other geographical units within the UK can be found on the National Statistics website, at the following address:

[http://www.statistics.gov.uk/geography/beginners\\_guide.asp](http://www.statistics.gov.uk/geography/beginners_guide.asp)



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