Appendix 7: Recalculations between last year (2011) and this year (2012) DA GHG estimates

This provides details of recalculations between last year's (2011) and this year's (2012) DA estimates.

Revisions and Updates to the Greenhouse Gas Inventories

Each year, the GHG inventories for England, Scotland, Wales and Northern Ireland are extended and updated. The time series of the inventories are extended to include the latest inventory year, and the inventories are revised to reflect any new or amended activity or emission factor data.

Data revisions may lead to changes to emission estimates for any year in the time-series. Core energy statistics (all DECC references) are revised annually and hence historic data from DECC may be different from that used in the compilation of the previous inventory report. Similarly, where new research has derived a more representative emission factor for a given activity, then the GHG time-series estimates will be revised accordingly.

New data may become available due to the implementation of new regulations, or through the commissioning of bespoke research into activities and emissions for a given source. For example, new data on fuel use and fuel quality across several source sectors has become available for use in the UK and DA GHG inventories through the EU ETS.

The nature of emission inventories is such that improvements to data collection or estimation techniques will inevitably lead to some revisions of historic data. Therefore, it is not appropriate to use data from previous reports and compare them with the figures in this report, without taking account of any changes to either the emission estimation methodology or the source data.

As a consequence of the development of DA-specific climate change legislation and strategies to reduce GHG emissions in each of the DAs, the emissions data and trends reported within the DA GHG inventories are coming under ever-greater scrutiny. The sensitivity of the DA data to changes in activities within sectors from implemented action has been researched by recent climate change policy studies.

Measures, policies and strategies continue to be developed to reduce GHG emissions; some policies and measures impact upon one sector, whilst others (e.g. promoting energy efficiency) may impact across many source sectors. Wales, Scotland, Northern Ireland and England each have devolved responsibility to address GHG emissions, and there are an increasing range of country-specific statutory and policy commitments.

To support the actions implemented within each country, the DA GHG inventories continue to be developed, aiming to provide an effective and accurate reporting tool and reflect the impact upon emissions from the implementation of both devolved and reserved measures.

The programme of improvement for the DA inventories includes periodic review of the available source data and estimation methods, in parallel with the programme of improvement to the UK GHG inventory. A considerable research effort has been invested in 2011-12 to improve GHG emission estimates at UK and DA level, and a prioritised list of future improvements has been developed in consultation with DECC and the DA Governments.

Inventory Recalculations

A number of changes have been made to the estimates since the last 2011 DA inventory estimates due to: (i) revisions to methodologies and source data within the UK GHG inventory, and (ii) through revisions to available data at local and sub-national level such as updates to the Interdepartmental Business Register, revised local energy data within the DECC sub-national Energy Statistics and from analysis of Phase II EU ETS data.

The UK GHG inventory is updated each year to reflect changes in statistics for earlier years, or changes to emission factors or methodologies. These changes are explained in the National Inventory Report (MacCarthy *et al* 2012). The majority of changes impact on the latter part of the time series (from 2005 onwards). This is due to the availability of EU ETS data for this period, and it is also the period covered by revisions to statistics in DUKES.

Table A7.1 presents an overview of the impact of inventory recalculations at DA and UK level.

Appendix 2 of this report provides more information about the DA inventory compilation methodologies and source data.

Table A7.1 Summary of the impact of recalculations by gas (2010 inventory estimate - 2009 inventory estimate, as kt CO_2e)

	Absolute Difference between 2011 and 2012 for 2009 (2012 - 2011)						% change for 2009 between 2011 and 2012 inventories					
NC Category	**England**	**Northern Ireland**	**Scotland**	**Wales**	**Unallocated**	**UK**	**England**	**Northern Ireland**	**Scotland**	**Wales**	**Unallocated**	**UK**
Agriculture	349.5	95.9	89.0	159.3	0.0	693.6	1%	2%	1%	3%	-	1.40%
Business	1747.1	361.5	1007.5	50.8	0.0	3167.0	3%	20%	16%	1%	-	3.70%
Energy Supply	1426.7	20.0	324.0	276.3	1665.3	3712.2	1%	1%	2%	2%	11%	1.91%
Industrial Process	-335.5	2.6	5.7	155.5	0.0	-171.8	-4%	1%	1%	11%	-	-1.65%
Land Use Change	-162.9	35.1	84.4	49.7	0.0	6.2	-10%	34%	-1%	-19%	-	-0.15%
Public	-17.4	13.1	59.0	7.4	0.0	62.0	0%	7%	7%	2%	-	0.76%
Residential	-446.7	-6.9	-37.0	-36.1	0.0	-526.7	-1%	0%	-1%	-1%	-	-0.67%
Transport	66.7	-16.5	30.5	-8.3	0.0	72.4	0%	0%	0%	0%	-	0.06%
Waste Management	-600.9	-263.4	149.0	-109.7	0.0	-824.9	-4%	-37%	7%	-11%	-	-4.61%
Grand Total	2026.5	241.3	1712.1	544.9	1665.3	6190.1	0.5%	1%	4%	1%	11%	1.10%

The main impacts of recalculations for each DA are presented in the DA chapters. Full details of the magnitude and reasons for changes are presented in table A7.2 below.

Table A7.2 – Reasons for change outlined by IPCC (actual change and percentage change by IPCC can be found in the accompanying spreadsheet "DA_GHGi_1990-2010_Issue 1.xls" ReasonsForChange sheet)

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
1A1a	Public Electricity&Heat Production	Energy Supply	Updated population time series using ONS data resulting in small percentage changes.	Increase in emissions due to OPG use in refineries following identification of gaps in energy statistics. Increase in emissions due to gas oil use in oil and gas extraction, which has been included in DUKES for the first time this year. This is only from 2005 onwards, however, it has been extrapolated back to maintain a consistent time series. Revisions made to activity data in DUKES from 2004 onwards (including power stations, refineries and gas production). Combustion of MSW, landfill gas and sewage gas for heat generation has been reallocated from 1A4a to 1A1. Revised GCV for coke, blast furnace gas and coke oven gas - now reported to greater level of accuracy in DUKES.
1A1b	Petroleum Refining	Energy Supply	No Change in Method	
1A1ci	Manufacture of Solid Fuels-coke	Energy Supply	Method Improvement. Operator reported emissions across the sector (CCA, EUETS, PI/SPRI) used to derive DA estimates for the I&S sector across all sources: BF, coke ovens, sinter plant, BOS plant, flaring. Some data discrepancies are still evident when compared against DUKES energy data, but the new method ensures the most accurate DA split of UK emissions. ISSB stats-based estimates retained for 1990-2004.	
1A1cii	Other Energy Industries	Energy Supply	No method change but some revisions to source data for the upstream oil and gas sector from revisions in EEMS data.	
1A2a	Manufacturing Industry&Construction:I&S	Business Industrial Process	Method Improvement. Operator reported emissions across the sector (CCA, EUETS, PI/SPRI) used to derive DA estimates for the I&S sector across all sources: BF, coke ovens, sinter plant, BOS plant, flaring. Some data discrepancies are still evident when compared against DUKES energy data, but the new method ensures the most accurate DA split of UK emissions. ISSB stats-based estimates retained for 1990-2004.	New research has caused reallocation of gas oil across sectors. The national total remains unchanged. Re-allocation of petrol and DERV from road transport to off-road machinery. Fuel consumption data for lime production revised to be in line with EU ETS data. Emissions from combustion of waste solvents in other industrial combustion have increased due to an updated emission factor. Additional emissions allocated to OPG use following analysis of EUETS data, where DUKES is noted as an under-report. Revised GCV for coke, blast furnace gas and coke oven gas - now reported to greater level of accuracy in DUKES. Revised GCV for fuel oil, gas oil and biomass fuels. Revisions made to activity data in DUKES for fuel oil from 2000 onwards and other fuels from 2005 onwards.
1A2b	Non-Ferrous Metals	Business	New method, using 2010 mapping grid to estimate DA share of the NFM sector. Trends presented are indicative only, as the UK trends 1990-2010 are used to back-cast the DA share to 1990.	
1A2c	Chemicals	Business	New method, using 2010 mapping grid to estimate DA share of the chemical sector. Trends presented are indicative only, as the UK trends 1990-2010 are used to back-cast the DA share to 1990.	
1A2d	Pulp Paper Print	Business	New method, using 2010 mapping grid to estimate DA share of the paper and pulp sector. Trends presented are indicative only, as the UK trends 1990-2010 are used to back-cast the DA share to 1990.	
1A2e	Food drink tobacco	Business	New method, using 2010 mapping grid to estimate DA share of the food and drink sector. Trends	

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
			presented are indicative only, as the UK trends 1990-2010 are used to back-cast the DA share to 1990.	
1A2f	Manufacturing Industry&Construction:Other	Business	New method for unclassified industry, ensuring that consistency with previous inventory analysis for the 1A2 sector is maintained but accommodating the new estimates for 1A2b,c,d and e. This unclassified sector is used as a "residual" to correct DA totals to the overall 1A2 data totals. Trends are therefore only indicative. Addition of OPG estimates in the UK inventory have affected DA inventories, especially thatof Scotland which has a notable increase in emissions across the time series to reflect industry use of these gases.	
1A2fii	Manufacturing Industry&Construction:Off-road	Business	No Change in Method	
1A3aii	Civil Aviation Domestic	Transport	NI: small revisions to source data.	Re-allocation of petrol and DERV from road transport to off-road machinery and inland waterways sectors. Revised vkm and vehicle fleet data. Revisions to gas oil activity data based on new research. New source – inland waterways – fuel reallocated from international shipping. New data source used for flights to and from overseas territories. Flights from OTs to UK now included. Minor changes to aircraft size categories. Emissions from railways increased due to updated estimates of passenger and freight rail fuel consumption figures reported by the Office of Rail Regulation and Association of Train Operating Companies. Emissions from road transport reduced due to the new method for estimating the composition of the vehicle fleet, particularly affecting emissions from artic HGVs.
1A3b	Road Transportation	Transport	Updated petrol and diesel car mix on different road types across the whole time series. Less vehicle-kilometres (vkm) are allocated to diesel cars on rural & motorway, and more vkm are allocated to diesel cars on urban roads.. For NI there are reported vkm data for LGVs with spikes in activity especially in 2006 and 2008 but is consistent with those underlying AD. The fluctuations in earlier years and different patterns across pollutants are a mixture of a big growth in diesel cars and vans during the 1990s, but also different emission performance as diesel engines developed, so the factors for the different pollutants were changing also.	
1A3c	Railways	Transport	Inter-city and regional have been split out leading to increase in E proportion and small decrease in S, W, NI. Includes NI freight 1990-2002 which accounts for a very small proportion of total freight.	
1A3di	International Marine	Exports	No Change in Method	
1A3dii	National Navigation	Transport	No Change in Method	
1A3e	Other Transportation	Transport	Now including more airports in UK; Increase in NI and S, decrease in E and W.	

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
1A4a	Commercial/Institutional	Business Public Transport	Updated to use new spatial analysis from IDBR and employment stats for 2008-2010 leading to changes with variable DA impact. Minor revisions to 1990-2004 data, to correct a methodological error which affects the commercial sector gas use estimates. Also the latter section of the trend for public sector estimates has been revised to use the PSEC data for N Ireland and new mapping grids. Some PSEC data corrected slightly (coal GCV revised).	Combustion of MSW for heat generation has been reallocated from 1A4a to 1A1, following a recommendation from the UNFCCC's review team. Revisions to gas oil activity data based on new research. Re-allocation of petrol and DERV from road transport to off-road (garden) machinery, following a study in to gas oil definitions and use. Revised assumptions for domestic combustion in Gibraltar - previously assumed some natural gas use (now removed from the inventory). Correction to LPG activity data for crown dependencies. Revised GCV for fuel oil, coke, coal, SSF and anthracite - now reported to greater level of accuracy in DUKES. Revisions made to activity data in DUKES from 2005 onwards.
1A4b	Residential	Residential	Updated population time series using ONS data resulting in small percentage changes.	
1A4bii	Residential:Off-road	Residential	Changes to the ONS absolute household number estimates leading to very small change.	
1A4ci	Agriculture/Forestry/Fishing:Stationary	Agriculture Transport	Change in England activity data (revisions to the data on number of employees in agriculture). Updated for new mapping grids in 2008-2010 leading to small changes mainly for E, S, NI. Decrease for E and Increase for S due to the addition of barley and oat to the method.	
1A4cii	Agriculture/Forestry/Fishing: Off-road	Agriculture Transport	Change in England activity data (revisions to the number of employees in agriculture).	
1A4ciii	Fishing	Agriculture Transport	No Change in Method	
1A5b	Other:Mobile	Transport	No Change in Method	Military aviation spirit included for the first time. Military Casual Uplift included.
1B1ai	Post-Mining Activities	Energy Supply	No Change in Method	A review has been conducted on emissions from closed coal mines, to reflect known changes in the mining industry (e.g. mines that closed earlier or remained open longer than projected), and also to reflect the impacts of coal mine methane utilisation. Revisions made to activity data in DUKES from 2008 onwards.
1B1ai	Underground Mines	#N/A	No change to method, but note that the updated analysis from the update to closed coal mine emission estimates has now been used in the UK Inventory, which feeds through to the DA estimates. NO change in DA % share of UK totals compared to 1990-2009 inventories, though.	
1B1aii	Surface Mines	#N/A	No Change in Method	
1B1b	Solid Fuel Transformation	Energy Supply	Method Improvement. Operator reported emissions across the sector (CCA, EUETS, PI/SPRI) used to derive DA estimates for the I&S sector across all sources: BF, coke ovens, sinter plant, BOS plant, flaring. Some data discrepancies are still evident when compared against DUKES energy data, but the new method ensures the most accurate DA split of UK emissions. ISSB stats-based estimates	

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
			retained for 1990-2004.	
1B2ai	Oil Exploration	Energy Supply	No Change in Method	Revisions to operator data from 2008 onwards
1B2aii	Oil Production	Energy Supply	Several revisions to source data from EEMS.	
1B2aiii	Oil Transport	Energy Supply	No Change in Method	
1B2aiv	Refining/Storage	Energy Supply	Several revisions to source data from EEMS.	
1B2bi	Gas Production	Energy Supply	Several revisions to source data from EEMS.	
1B2bii	Transmission/ Distribution	Energy Supply	No Change in Method	
1B2ci_Flaring_Oil	Flaring Oil	Energy Supply	No Change in Method	
1B2ci_Venting_Oil	Venting Oil	Energy Supply	Several revisions to source data from EEMS.	
1B2cii_Flaring_Gas	Flaring Gas	Energy Supply	No Change in Method	
1B2cii_Venting_Gas	Venting Gas	Energy Supply	Several revisions to source data from EEMS.	
2A1	Cement Production	Industrial Process	No Change in Method	The emission factor for lime production has been revised to reflect the mixture of limestone and dolomite used. Revisions have been made to emissions from fletton brick manufacture following correction of an error in calculations for one site.
2A2	Lime Production	Industrial Process	No Change in Method	
2A3	Limestone & Dolomite Use	Energy Supply Industrial Process	Method Improvement. Operator reported emissions across the sector (CCA, EUETS, PI/SPRI) used to derive DA estimates for the I&S sector across all sources: BF, coke ovens, sinter plant, BOS plant, flaring. Some data discrepancies are still evident when compared against DUKES energy data, but the new method ensures the most accurate DA split of UK emissions. ISSB stats-based estimates retained for 1990-2004.	
2A4	2A4_Soda_Ash_Production_&_Use	Industrial Process	No Change in Method	
2A7	(Fletton Bricks)	Industrial Process	No Change in Method	
2A7	Glass Production	Industrial Process	No Change in Method	
2B1	Ammonia Production	Industrial Process	No Change in Method	CO2 recovery is no longer subtracted from the emissions

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
2B2	Nitric Acid Production	Industrial Process	No Change in Method	total for ammonia production. This is because it is not clear if the storage is permanent and to ensure compliance with the IPCC guidelines. From 2006 onwards revisions have been made to vehicle statistics and sales data for household products, affecting the emissions from the breakdown of consumer products.
2B3	Adipic Acid Production	Industrial Process	No Change in Method	
2B5	Carbon from NEU of products	Agriculture Business Industrial Process	No Change in Method	
2B5	Chemical Industry Other	Residential	Updated population time series using ONS data resulting in small percentage changes. Updated PSDB (2010) leading to small change in E and W for 2008.	
2C1	Iron&Steel	Industrial Process	Method Improvement. Operator reported emissions across the sector (CCA, EUETS, PI/SPRI) used to derive DA estimates for the I&S sector across all sources: BF, coke ovens, sinter plant, BOS plant, flaring. Some data discrepancies are still evident when compared against DUKES energy data, but the new method ensures the most accurate DA split of UK emissions. ISSB stats-based estimates retained for 1990-2004.	The use of updated data in the carbon balance leads to an increase in the emission factor generated for blast furnace gas and, thus, an increase in emissions. Revision to energy statistics in 2009.
2C3	Aluminium Production	Industrial Process	No Change in Method	
2C4	Cover gas used in Al and Mg	Industrial Process	No Change in Method	
2C4	SF6 Used in Aluminium and Magnesium Foundries	Industrial Process	No Change in Method	
2E1	Production of Halocarbons and Sulphur Hexafluoride	Industrial Process	No Change in Method	Correction. Projected value previously used.
2E2	Production of Halocarbons and Sulphur Hexafluoride	Industrial Process	No Change in Method	
2F1	Refrigeration and Air Conditioning Equipment	Business	Updated population time series using ONS data resulting in small percentage changes.	The refrigeration and air conditioning model has been re built to utilise bottom up data across all categories. All parameters have been reviewed and revised.
2F2	Foam Blowing	Business		
2F3	Fire Extinguishers	Business		
2F4	Aerosols	Residential		
2F5	Solvents	Business		
2F9	Other (one component foams)	Business		
2F9	Other (semiconductors electrical sporting	Business		

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
	goods)			
3	Solvent and Other Product Use	Industrial Process	Updated population time series using ONS data resulting in small percentage changes.	
3D	Solvent and Other Product Use Other	Industrial Process	No Change in Method	
4A10	Enteric Fermentation Deer	Agriculture	Animal numbers were revised and updated. Animal categories have been revised and updated. The time spent grazing for dairy and beef cattle has been changed. For dairy cows the Tier 2 methodology for calculating enteric methane was revised from the 1996 Guidelines to the IPCC 2000 Good Practice Guidance.	
4A1a	Enteric Fermentation Dairy	Agriculture		
4A1b	Enteric Fermentation Non-Dairy	Agriculture		
4A3	Enteric Fermentation Sheep	Agriculture		
4A4	Enteric Fermentation Goats	Agriculture		
4A6	Enteric Fermentation Horses	Agriculture		
4A8	Enteric Fermentation Swine	Agriculture		
4B10	Manure Management Deer	Agriculture	Animal numbers were revised and updated. Animal categories have been revised and updated. The time spent grazing for dairy and beef cattle has been changed. Tier 2 for CH4 from manure management has been developed. AWMS distribution has been updated. The N2O-N emitted during manure management is no longer subtracted from the N available to apply to soils.	
4B12	Liquid Systems	Agriculture		
4B13	Solid Storage and Drylot	Agriculture		
4B14	Other	Agriculture		
4B1a	Manure Management Dairy	Agriculture		
4B1b	Manure Management Non-Dairy	Agriculture		
4B3	Manure Management Sheep	Agriculture		
4B4	Manure Management Goats	Agriculture		
4B6	Manure Management Horses	Agriculture		
4B8	Manure Management Swine	Agriculture		
4B9	Manure Management Poultry	Agriculture		
4D	Agricultural Soils	Agriculture	Animal numbers were revised and updated. Animal categories have been revised and updated. Updated N excretion factors for cattle.	

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
			AWMS distribution has been updated. Crop areas, production and categories have been updated. The N2O-N emitted during manure management is no longer subtracted from the N available to apply to soils. Correction to the calculation of direct N2O from grazing - the N input is no longer corrected for 20% atmospheric deposition. Crop residues now include all legumes not only Phaseolus beans. Amended crop residue calculations to account for fraction of residue burnt (applies to wheat, barley, oats, linseed). Field burning detailed calculations have been amended to include the years 1990-1993.	
4F1	Field Burning of Agricultural Residues	Agriculture	Minor revisions to data for early years of time series.	
4F5	Field Burning of Agricultural Residues	Agriculture		
5A	Forest Land (Biomass Burning - wildfires)	Land Use Change	Small changes in net emissions/removals from this category arise from updated activity data and improved reporting of deforestation. Deforestation data derived from unconditional felling licences was previously only available for England. Felling licence data from Scotland and Wales from the late 1990s onwards are included for the first time, with gap-filling based upon Countryside Survey data used to determine deforestation rates in earlier years.	
5A1	Forest Land Remaining Forest Land	Land Use Change		
5A2	Forest Land (N fertilisation)	Land Use Change		
5A2	Land Converted to Forest Land	Land Use Change		
5B	Cropland (Biomass Burning - controlled)	Land Use Change	Adjustment of GB liming emissions due to increased precision in agricultural data and new data source for Northern Ireland.	Restructuring of sub-category for 20 year transition period. Areas of forest converted to other land uses now reported by country. New activity data for deforestation. Emissions from land use change more than 20 years ago not accounted
5B	Liming	Land Use Change		
5B1	Cropland Remaining Cropland	Land Use Change		
5B2	Land Converted to Cropland	Land Use Change		
5B2	N2O emissions from disturbance associated with land-use conversion to cropland	Land Use Change		
5C	Grassland (Biomass burning - controlled)	Land Use Change	Adjustment of GB liming emissions due to increased precision in agricultural data and new data source for Northern Ireland.	Restructuring of sub-category for 20 year transition period. Areas of forest converted to other land uses now reported by country. New activity data for liming and deforestation, undisturbed grassland reported. N2O emissions from disturbance associated with land use conversion to Cropland were included for the first time.
5C	Liming	Land Use Change		
5C1	Grassland Remaining Grassland	Land Use Change		
5C2	Land converted to grassland	Land Use Change		

IPCC	IPCC Description	NC Format	DA Reasons for Change	UK Reasons for Change
5D1	Wetlands remaining wetlands	Land Use Change	Inclusion of additional peat extraction sites. Updated activity data for horticultural peat sales (2009)	Corrections to the land use change model, and the new deforestation and liming data.
5D2	Non-CO2 emissions from drainage of soils and wetlands	Land Use Change		
5E	Settlements (Biomass burning - controlled)	Land Use Change	Small changes in net emissions 1990-2010 arose from corrections to the land use change model. Updated activity data on deforestation, particularly Forest converted to Settlements was included, affecting net emissions/removals from this subcategory and associated biomass burning emissions.	
5E1	Settlements remaining settlements	Land Use Change		
5E2	Land converted to settlements	Land Use Change		
5G	Other (Harvested wood)	Land Use Change	Changing inputs to the harvested wood products pool (due to updated activity data for deforestation) resulted in small changes to the carbon emissions/removals from this category.	
5G	Other (OT and CD)	Land Use Change		
6A1	Managed Waste Disposal on Land	Waste Management	New DA-specific runs of the MELMod landfill gas model conducted by Defra. Revisions to DA estmates of UK share across the time series.	Correction to model. Previous version included an error that overestimated DDOC landfilled.
6B2	Wastewater Handling	Waste Management	No Change in Method	Removal of double count of emissions from sewage sludge applied to agriculture. Revised emissions due to revised activity data in Northern Ireland.
6C	Waste Incineration	Residential Waste Management	Updated population time series using ONS data resulting in small percentage changes.	Activity data for chemical and clinical waste incineration for 2009 replaced with up to date data.

Table A7.3 – Changes in emission by IPCC (Full details with descriptions from table A7.2 above can be found in the accompanying spreadsheet "DA_GHGi_1990-2010_Issue 1.xls" ReasonsForChange sheet)

	Base Year (2012 - 2011) kt emission change				*2009 (2012 - 2011) kt emission change*			
IPCC	England	Wales	Scotland	Northern Ireland	England	Wales	Scotland	Northern Ireland
1A1a	*76.6*	*0.2*	*2.5*	*0.1*	*566.5*	*53.8*	*47.0*	*20.0*
1A1b	*26.7*	*8.2*	*6.6*		*1147.3*	*300.2*	*209.5*	
1A1c	*6.7*	*0.0*	*88.5*		*-59.8*	*417.7*	*256.8*	
1A2	*112.4*	*101.0*	*838.4*	*325.2*	*-579.5*	*-36.4*	*500.1*	*258.9*
1A3a	*-2.1*	*0.0*	*-2.2*	*-0.5*	*-0.7*	*-0.8*	*-12.0*	*-2.3*
1A3b	*-833.0*	*-50.8*	*-93.2*	*-14.8*	*-1194.6*	*-80.0*	*-110.5*	*-64.4*
1A3c	*-37.9*	*4.2*	*-3.9*	*0.0*	*33.1*	*9.3*	*8.8*	*1.7*
1A3d	*404.5*	*24.3*	*43.1*	*13.5*	*749.8*	*43.4*	*75.2*	*25.9*
1A3e	*-15.3*	*-1.3*	*12.9*	*3.7*	*-30.2*	*0.1*	*20.0*	*10.1*
1A4a	*-1142.9*	*-83.2*	*-137.9*	*-82.5*	*-216.7*	*4.2*	*307.2*	*23.3*
1A4b	*1.0*	*0.1*	*0.5*	*0.3*	*-448.0*	*-36.2*	*-37.1*	*-7.0*
1A4c	*-1.9*	*-1.5*	*4.3*	*-0.9*	*-45.5*	*-0.7*	*2.0*	*29.0*
1A5b					*539.1*	*22.7*	*52.2*	*14.4*
1B1a	*-4.0*	*-3.5*	*-0.5*		*-201.4*	*-517.7*	*-189.2*	
1B1b					*-23.3*	*22.3*		
1B2a	*-13.3*	*0.0*	*-3.0*		*0.3*			
1B2b	*-44.4*	*0.0*	*-10.0*					
2A2	*14.9*				*-392.9*			
2A3	*-161.0*	*-3.4*	*-27.8*	*0.0*	*-202.9*	*12.9*	*-26.5*	*-11.9*
2A4	*-140.1*	*-3.0*	*-24.2*	*0.0*	*-148.9*	*-4.9*	*-21.5*	*-9.6*
2A7	*301.1*	*6.4*	*52.1*	*0.0*	*336.8*	*12.3*	*53.6*	*24.1*
2B1	*109.5*				*47.2*			
2B5	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*0.1*	*0.1*	*0.0*
2C1					*-41.6*	*102.6*		
2E1					*-10.8*			
2F1	*-109.4*	*-5.9*	*-15.1*	*0.1*	*2573.7*	*120.0*	*256.0*	*90.5*
2F3	*0.0*	*0.0*	*0.0*	*0.0*				
2F4	*0.1*	*0.0*	*-0.1*	*0.0*				
2F9	*0.0*	*0.0*	*0.0*	*0.0*				
2F9	*0.0*	*0.0*	*0.0*	*0.0*				
4A10	*-1.7*	*-0.1*	*1.3*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*
4A1	*47.7*	*12.1*	*27.6*	*16.7*	*4.1*	*1.5*	*6.2*	*2.3*
4A3	*19.6*	*10.2*	*9.9*	*2.8*	*14.4*	*7.5*	*7.4*	*2.2*
4A4	*-1.3*			*-0.4*				
4A6	*2.2*	*-2.7*	*1.0*	*-0.5*				
4B12	*-2.4*	*-0.7*	*-0.8*	*-0.5*	*0.0*	*0.2*	*-0.2*	*0.2*
4B13	*-226.5*	*-3.4*	*-20.3*	*-36.0*	*-167.3*	*-13.1*	*-32.8*	*-35.5*
4B14	*-340.6*	*-24.9*	*-42.5*	*-30.3*	*-37.3*	*-5.8*	*-0.2*	*-17.1*
4B1	*-214.5*	*-40.7*	*-68.4*	*-54.0*	*2.8*	*-0.9*	*-32.7*	*-10.0*
4B3	*12.0*	*5.9*	*5.5*	*1.6*	*8.7*	*4.5*	*3.8*	*1.1*
4B4	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
4B6	*0.1*	*-0.2*	*0.1*	*0.0*	*-0.1*	*0.0*	*0.0*	*0.0*
4B8	*317.8*	*5.2*	*22.7*	*31.6*	*-127.1*	*-0.8*	*-12.7*	*-13.8*
4B9	*-44.7*	*-2.8*	*-4.7*	*-3.5*	*3.4*	*-2.2*	*3.5*	*-4.9*
4D	*592.7*	*228.8*	*-193.5*	*105.6*	*693.3*	*169.0*	*144.8*	*142.5*

	Base Year (2012 - 2011) kt emission change				***2009 (2012 - 2011) kt emission change***			
IPCC	England	Wales	Scotland	Northern Ireland	England	Wales	Scotland	Northern Ireland
4F1	*-11.2*	*17.6*	*-15.5*	*8.5*				
4F5	*-0.1*	*0.0*	*0.0*	*0.0*				
5A	*18.4*	*4.4*	*13.9*	*15.0*	*47.1*	*13.6*	*50.3*	*3.1*
5A1	*-0.1*	*0.2*	*0.1*	*-0.2*	*0.6*	*11.9*	*20.8*	*5.7*
5A2	*-7.3*	*-4.0*	*-36.7*	*-3.6*	*-33.4*	*-9.2*	*-69.8*	*-7.1*
5B	*1.6*				*1.5*			
5B1	*1054.6*	*134.0*	*782.1*	*341.6*	*1939.9*	*390.4*	*2170.3*	*466.5*
5B2	*-1025.6*	*-133.4*	*-774.1*	*-343.6*	*-1924.0*	*-388.9*	*-2162.8*	*-467.8*
5C	*0.8*	*2.8*	*7.1*	*0.8*	*-88.2*	*-7.6*	*-4.0*	*7.9*
5C1	*-448.8*	*-41.1*	*-616.3*	*-562.6*	*-1656.8*	*-311.7*	*-1848.4*	*-753.4*
5C2	*454.6*	*48.5*	*621.4*	*533.1*	*1486.0*	*305.5*	*1827.6*	*751.7*
5D1	*34.4*	*0.0*	*9.0*	*16.0*	*-92.8*	*0.0*	*41.9*	*31.9*
5D2			*0.0*				*0.0*	
5E	*-7.4*	*3.2*	*-2.1*	*4.6*	*1.0*	*21.3*	*30.6*	*8.3*
5E1	*989.3*	*130.9*	*465.1*	*148.4*	*1393.6*	*281.6*	*636.2*	*199.8*
5E2	*-1003.1*	*-128.2*	*-469.6*	*-166.8*	*-1375.3*	*-248.0*	*-588.2*	*-195.9*
5G	*-0.6*	*-9.3*	*-9.9*	*-8.2*	*137.7*	*-9.2*	*-20.0*	*-15.8*
6A1	*-11490.7*	*-915.9*	*97.9*	*-766.1*	*-411.0*	*-100.6*	*170.3*	*-254.7*
6B2	*-73.5*	*-8.4*	*-2.2*	*-3.5*	*-183.5*	*-8.7*	*-20.8*	*-8.5*
6C	*13.4*	*1.7*	*0.0*	*0.0*	*-6.4*	*-0.3*	*-0.5*	*-0.2*
Total	*-12792.5*	*-718.8*	*538.9*	*-508.8*	*2029.5*	*544.9*	*1712.1*	*241.3*