

Appendix 6: Recalculations between last year (2012) and this year (2013) Devolved Administrations' Greenhouse Gas estimates

This provides details of recalculations between 1990-2010 Devolved Administrations' (DA) greenhouse gas (GHG) Inventory estimates (G. Thistlethwaite *et al.*, 2012) and the latest 1990-2011 DA GHG Inventory estimates.

Introduction

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 European Union Emissions Trading Scheme (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 2012-13 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.

Revisions and Updates to the Greenhouse Gas Inventories

The overall impact on 2010 estimates compared to the 2012 DA GHG inventory as a result of changes to methods or revisions to activity data have been:

- England 2010 increased by 2906 kt of CO₂eq (0.65%)
- Scotland 2010 increased by 1266 kt of CO₂eq (2.38%)
- Wales 2010 decreased by 269 kt of CO₂eq (-0.58%)
- Northern Ireland 2010 increased by 482 kt of CO₂eq (2.36%)
- Unallocated (off shore and terminals) 2010 decreased by 594 kt of CO₂eq (-3.40%)
- UK overall 2010 increase of 3791 kt of CO₂eq (0.6%)

Improvements to DA Inventory Data

In the derivation of the 1990-2011 DA GHGI datasets, the inventory methods and data sources for several GHG emission source sectors have been revised and improved, including:

Energy Supply

- **New Source:** Recalculations in the UK GHG Inventory for the use of Other Petroleum Gases in the industrial sector have led to increases across the times series for Other Industrial Combustion (1A2f) emissions for Scotland and England, and increases in the early part of the time series for Wales. This reflects research at UK level to identify where chemical and petrochemical sites utilise process off-gases as a combustion fuel where the carbon in the fuels is derived ultimately from petroleum feedstock that within the UK energy statistics are assumed to be applied to non-energy uses only. The inventory agency has addressed this previous under-report for a number of sites in England and Scotland that are operating, and also for a site in Wales that closed in the early 1990s. The annual estimates for these sites are based on operator-reported emission totals through EU ETS and IPPC during the 2000s, back-cast across the time series using plant capacity data. Estimates for the plant in Wales were also based on plant capacity information, assuming an emissions-per-unit-production performance and plant utilisation equivalent to the other UK production plant;
- EU ETS data has been used to inform sector fuel allocations where EU ETS data are inconsistent with UK energy statistics; specifically, gas use in the downstream gas transmission and distribution network has been increased through use of EU ETS data, with an equal and opposite reduction in gas use in the unclassified other industrial combustion to compensate, maintaining the overall national gas use balance;
- Emission estimates from combustion, flaring, fugitive and process sources in the upstream oil and gas sector have been revised following an overhaul of UK GHG inventory estimates to address outlier emission factors and reconcile data from the Digest of UK Energy Statistics (DUKES) with the Environmental and Emissions Monitoring System (EEMS) dataset.

Research to align energy use against emissions data and consultation with the DECC DUKES team identified under-reports in the UK activity data for the sector from 1990-2001 (natural gas use) and for 2003 onwards (LPG, OPG use in terminals). These have been revised and updated to use EEMS and EU ETS data, leading to a much more realistic time series of implied emission factors for the combustion and flaring of gaseous fuels used in this sector. The UK and DA inventory time series have therefore been revised, with the DA methods revised for several sources in the early part of the time series, where the operator-reported data from 1998 is now regarded as a better indicator of the share of DA activity for earlier years. In addition, there have been re-allocations between “upstream oil” and “upstream gas” to correct previous allocations for a couple of installations, although these only impact upon the offshore (i.e. unallocated) inventory estimates. Gap-filling for process and fugitive sources has in some cases led to small increases in the DA inventories within the time series, predominantly leading to higher methane and VOC emission estimates in some years.

- Industrial combustion emissions from fuel oil and waste oils have been revised for 2009-10 to correct a mis-allocation in the inventory agency point source database. This correction slightly increases the allocation of industrial emissions in Northern Ireland in those years;
- Methane emissions from deep coal mines have been revised for recent years within the UK GHG inventory, and these revised data are reflected in the 1990-2011 DA GHGI estimates;

Transport

- Revisions to the road transport emission estimation methods, especially due to revisions to the approach for minor roads, at UK level have impacted on the DA estimates for the sector, with variable impacts that reflect the different fleet compositions and activities within the DAs. (See the *Road Transport sector methodological text later in this Appendix for details.*)

Energy consumption in Business, Residential and Public

- **New Source:** Emissions from charcoal production and use within the residential sector have been added to the UK and DA inventories within the 1990-2011 compilation cycle. The DA driver to estimate the share of emissions from charcoal sources is based on the mapping grid used for domestic wood;
- **New Source:** The estimates for gas leakage at point of use, within the residential, commercial and public sectors have been revised to include new estimates for releases of gas from cooking appliances and domestic gas fires. The DA share of these new UK estimates assumes that each DA follows the UK trend and has a similar level of leakage per unit gas consumed in the residential, public and commercial sectors;

Industrial Process

- Primary Aluminium emission estimates for 2010 have been revised, as within the UK GHG inventory there was a correction to previous assumptions about the share of production in light of the closure of the Anglesey Aluminium plant during 2010. It was assumed that some production continued at that site into 2010, but this was incorrect; further research indicated that Pollution Inventory emissions reported for 2010 were evidently for ancillary processes covered in other source categories, so these primary aluminium estimates have been removed from the Wales 2010 inventory, to remove a small double-count.

Agriculture

- Revisions to activity data and assumptions underlying the estimates from agricultural soils have impacted across all DAs.

Land Use, Land Use Change and Forestry

- **New Source:** LULUCF emissions of non-CO₂ gases from drainage of organic soils and wetlands have been added to the UK and DA inventories in the 1990-2011 cycle, based on new activity data.
- Revisions to deforestation and wildfire activity data and method improvements to apply country-specific biomass densities to analysis for sources in 5B, 5C and 5E have led to revisions of the LULUCF inventories for each DA.

Waste Management

- **New Source:** Emissions from industrial waste water treatment have been included in the UK GHG inventory based on a new estimation method in the 1990-2011 inventory cycle. The DA emissions from this source are estimated using the data reported by UK water companies from the waste water treatment and disposal in the municipal system;
- New emissions data from water companies led to a revision of the default methane emission factors for waste water treatment, sludge treatment and disposal of sewage sludge to land. The main impact of these revisions is an increase in (UK-wide) methane estimates in source 6B1 in the early part of the time series. The increase affects the DAs to a differing degree based on the DA-specific activity data for sludge treatment and disposal fate.

Miscellaneous

- For those sources where population data are used as the driver to estimate the DA share of UK emissions (including several F-gases sources), the ONS has revised its population statistics from 2002 onwards, leading to small revisions in DA emission estimates.

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 for the year 2010 (2013 inventory estimate (Latest) - 2012 inventory estimate (Last years), as kt CO₂e). Negative = decrease in latest (2013) inventory)

NC Category	Absolute Difference between 2013 and 2012 estimates for the year 2010 (2013 - 2012)						% change for 2010 between 2013 and 2012 inventories.					
	England	Scotland	Wales	Northern Ireland	Unallocated	UK	England	Scotland	Wales	Northern Ireland	Unallocated	UK
Agriculture	262	4	-23	254	0	497	1%	0%	0%	5%	0	1%
Business	1663	1255	-234	179	0	2864	2%	17%	-2%	8%	0	3%
Energy Supply	585	-2	-97	-7	-594	-115	0%	0%	-1%	0%	-3%	0%
Industrial Process	885	-3	-23	-3	0	856	11%	-1%	-1%	-2%	0	8%
Land Use Change	-1	-50	193	36	0	178	0%	1%	-464%	34%	0	-5%
Public	-31	-1	-6	-12	0	-50	0%	0%	-2%	-6%	0	-1%
Residential	-18	-2	3	-7	0	-25	0%	0%	0%	0%	0	0%
Transport	-1585	-19	-152	2	0	-1754	-2%	0%	-2%	0%	0	-1%
Waste Management	1146	83	71	40	0	1339	9%	4%	8%	9%	0	8%
Grand Total	2906	1266	-269	482	-594	3791	1%	2%	-1%	2%	-3%	1%

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 by IPCC Source Category

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
Total Change			2906.17 (0.64%)		1266.28 (2.23%)		-268.9 (-0.58%)		482.09 (2.3%)
1A1a: Public Electricity & Heat Production	Minor revision to data for fuel oil and coal to address errors in point source data analysis (duplicate entry for a small power site in England in 2010). Also UK-wide revisions to emissions from MSW in power generation and a revision to petroleum coke activity data for power generation (which only affects England data).	28%	320.16	25%	-21.10	24%	-18.14	19%	-7.19
1A1b: Petroleum Refining	UK level revisions. A small correction of estimates at Grangemouth for recent years to include SPRI residual estimates (SPRI emission totals are higher than EUETS data for one refinery in Scotland).	3%	-169.06	5%	48.62	8%	-53.04	0%	0.00
1A1ci: Manufacture of Solid Fuels and other energy industries	Upstream oil & gas: Improvements to activity data for own gas use and LPG/OPG use at terminals across the time series, following review recommendations to address outlier IEFs. In addition there have been some oil-gas site re-allocations. Coke manufacture: revisions to DUKES activity data for recent years.	1%	116.13	3%	-45.67	3%	-27.67	0%	0.00
1A2a: Manufacturing Industry & Construction: Iron and Steel	Revision to DUKES data from 2009 onwards for Blast Furnace Gas in Blast Furnaces.	2%	-325.48	0%	0.01	14%	-195.64	0%	0.00
1A2b: Non-Ferrous Metals	UK revisions to gas oil data, and a revision to point source data on natural gas use for two NFM sites in Wales, increasing the Wales estimates for 2010 only.	0%	-18.35	0%	-0.42	0%	18.63	0%	-0.07

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
1A2c: Chemicals	UK inventory revision to fuel allocations, leading to revisions in the point source analysis. In England, sites previously allocated to chemicals sector, natural gas use re now reported under 1A2f other industry as OPG use. Scotland and Wales allocation of gas use in the sector is slightly increased. Also a revision to the ammonia production gas use allocation, which affects England only, due to new operator data on gas use as feedstock and as a fuel.	1%	-292.45	2%	133.90	1%	34.97	1%	-0.09
1A2d: Pulp Paper Print	Minor revisions of UK activity data	1%	8.77	1%	0.70	0%	0.60	0%	0.32
1A2e: Food drink tobacco	Corrections to England point source data analysis for 2009 and 2010, leading to slightly lower natural gas allocation to England for those years.	1%	-50.97	1%	6.42	0%	1.70	1%	-0.48
1A2f: Manufacturing Industry & Construction: other	The main revision in 1A2f is the addition of emissions due to new estimates in the UK inventory for the use of OPG in industrial boilers, to address an under-report in the UK energy balance. Consultation with regulators and plant operators, and scrutiny of emissions and activity data from PI, SPRI, EUETS and DUKES provided evidence of use of off-gases from petrochemical production processes in boilers on specific industrial sites in England and Scotland (and Wales in the early part of the time series before plant closure in 1993). Other changes arise from: UK-wide revisions to gas oil allocations; a revision to DA allocations of fuel use in industrial off-road machinery to use updated energy mapping analysis consistent with the DECC sub-national energy statistics; new UK-wide estimates for emissions from biomass; revisions to the allocation of natural gas use in Northern Ireland across sectors (total use remains the same) has led to small increases in other source estimates and, therefore, a lower gas use in "other industry" than	7%	2,437.30	9%	1,120.04	5%	-59.21	7%	176.45

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
	estimated last year (as this is used as the residual to correct the overall gas supplier total); revisions to gas use in other industrial combustion across GB as a result of changes in point source analysis across 1A2 and revisions to DUKES activity data for gas-fired autogeneration; increased UK-wide allocation of fuel oil in industry of around 200% in 2010.								
1A3a: Civil Aviation Domestic	Small revisions to activity data.	0%	1.30	1%	0.57	0%	0.01	1%	0.22
1A3b: Road Transportation	UK-wide revision to HGV emissions, now estimated to be around 2% higher in 2010 than in the previous submission. There has also been a revision to minor road vehicle km data based on more detailed survey information, leading to lower emissions estimated for urban driving (especially cars, LGVs) for England and Wales, with a lesser impact in Scotland and N Ireland.	21%	-1,581.37	19%	0.52	12%	-95.61	19%	-2.64
1A3c: Railways	UK-wide emission estimates are lower than previously reported due to DUKES gas oil revisions for the rail sector. In addition, the DA methodology has been improved to use analysis from the DfT's Rail Emissions Model for the first time.	0%	-102.84	0%	-48.51	0%	-80.16	0%	-4.88
1A3d: National Navigation	Increased estimates across all DAs due to revised DUKES activity data.	0%	12.32	1%	0.68	0.01	1.04	0.00	0.23
1A3e: Other Transportation	No changes	0%	0.00	0%	0.00	0.00	0.00	0.00	0.00
1A4a: Commercial/Institutional	Revisions to UK activity data for coal and fuel oil.	3%	-55.23	4%	-4.32	1%	-7.57	2%	-11.47

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
1A4b: Residential	Revisions to UK activity data for oil use in residential sector leading to lower emission estimates across all DAs. Emissions from charcoal use have been added to the UK and DA inventories this year. Small revisions to the energy mapping analysis for LPG have offset these reductions in Scotland and Wales, but changes across all DAs are small.	12%	-6.13	13%	2.41	8%	1.86	15%	-5.71
1A4c: Agriculture /Forestry/Fishing	Large increases to the DUKES allocation of oil use in fishing vessels, affecting all DA inventories.	1%	136.38	2%	30.53	1%	21.08	3%	7.18
1A5b: Other: Mobile	UK estimates have been revised to correct the conversion of military fuel consumption data by financial year to calendar year and to align the emission factors with those for other UK aviation spirit combustion. In addition, updated economic data for the DAs has slightly modified the DA allocation of these emissions.	1%	-42.56	0%	-3.89	0%	-0.37	0%	0.93
1B1a: Post-Mining Activities	UK estimates have been revised through consultation with colliery operators, increasing emission estimates from deep collieries across England and Wales. A change to UK inventory reporting has reallocated the estimates from closed coal mines from IPCC 1B1a to 1B1c (see below).	0%	199.56	0%	-74.11	0%	-203.84	0%	0.00
1B1b: Solid Fuel Transformation	New UK inventory estimates for emissions from charcoal production are included within DA inventories for the first time this year.	0%	2.73	0%	0.26	0%	0.12	0%	0.07
1B1c: Closed Coal Mines	Emissions from closed coal mines are reported separately under 1B1c for the first time in the UK and DA inventories, having formerly been included within 1B1a. No revisions to source emission estimates or DA allocation have been made.	0%	86.73	0%	74.11	0%	205.66	0%	0.00
1B2a: Oil Exploration	Minor revisions to oil loading and process emissions estimates impact on the unallocated (offshore)	0%	0.00	0%	0.00	0%	0.00	0%	0.00

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
	inventory.								
1B2b: Distribution	UK-wide emission estimates are higher due to the new inclusion of gas leakage at point of use in domestic and commercial cooking appliances. In addition, a small revision to estimates of leakage from the gas network in Wales has been made based on gas network operator data.	1%	4.73	1%	1.79	1%	-0.23	0%	0.44
1B2ci: Venting Gas	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
1B2c: Flaring Gas	Minor revisions to UK and DA estimates from upstream oil and gas flaring, predominantly leading to higher estimates for the unallocated (offshore) inventory.	0%	-2.39	1%	14.26	0%	-0.04	0%	0.00
2A1: Cement Production	No changes	1%	0.00	1%	0.00	1%	0.00	1%	0.00
2A2: Lime Production	Revisions to UK activity data impact across all DAs, with lime sector data only affecting England.	0%	862.34	0%	0.00	0%	0.00	0%	0.00
2A3: Limestone & Dolomite Use	Increased estimates of emissions from Flue Gas Desulphurisation plant in England. Note that there are no estimates currently in the NAEI for the FGD technology deployed at coal-fired power stations in Wales, N Ireland or Scotland.	0%	26.75	0%	0.00	1%	0.00	0%	0.00
2A7: Other mineral products	Revisions to UK activity data impact across all DAs, with lime sector data only affecting England.	0%	-36.58	0%	-5.34	0%	-1.13	0%	-2.63
2B1: Ammonia Production	Minor revision to data from ammonia production use of natural gas as feedstock, only affects England.	0%	-9.06	0%	0.00	0%	0.00	0%	0.00
2B2: Nitric Acid Production	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
2B3: Adipic Acid Production	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
2B5: Carbon from NEU of products	Updated UK activity data time series for detergents, pesticides, petroleum waxes and energy recovery.	0%	-3.76	0%	-2.38	0%	0.05	0%	-0.55

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
2C1: Iron and Steel	Revision to energy statistics impacting on the Carbon EFs generated from the carbon balance method, leading to iron and steel flaring emission estimates in England and Wales around 4% lower than previously reported.	0%	-21.82	0%	0.00	2%	-43.69	0%	0.00
2C3: Aluminium Production	Correction to data for 2010, as primary aluminium emissions had ceased completely at the Wales plant, with small under-reports for England and Scotland plant now rectified.	0%	12.52	0%	2.10	0%	-14.44	0%	0.00
2C4: Cover gas used in Al and Mg foundries	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
2E1: Production of Halocarbons and Sulphur Hexafluoride	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
2E2: Production of Halocarbons and Sulphur Hexafluoride	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
2F1: Refrigeration and Air Conditioning Equipment	Minor modifications to the UK F-gas model, and small revisions to the DA population and economic data used to estimate DA share of UK emission totals.	2%	-3.53	2%	-1.34	1%	2.51	1%	2.36
2F2: Foam Blowing		0%	0.14	0%	-0.18	0%	0.10	0%	-0.06
2F3: Fire Extinguishers		0%	0.09	0%	-0.12	0%	0.07	0%	-0.04
2F4: Aerosols		1%	1.25	0%	-1.63	0%	0.93	0%	-0.56
2F5: Solvents		0%	0.05	0%	-0.06	0%	0.04	0%	-0.02
2F9: Other (one component foams)		0%	0.02	0%	-0.02	0%	0.01	0%	-0.01
3: Solvent and Other Product Use	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4A1: Enteric Fermentation Cattle	UK updates on feed digestibility; cow milk yield data for 2009 and 2010; dairy cow live weights for the years 1997-2005 based on UNFCCC 2012 in country review recommendation.	2%	-74.58	4%	-11.87	3%	-14.23	9%	-18.07
4A10: Enteric	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00

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		% of Total (2011)	2010 - 2010 (kt CO ₂ e)	% of Total (2011)	2010 - 2010 (kt CO ₂ e)	% of Total (2011)	2010 - 2010 (kt CO ₂ e)	% of Total (2011)	2010 - 2010 (kt CO ₂ e)
Fermentation Deer									
4A3: Enteric Fermentation Sheep	Lamb lifespan revised from 6 months to 8.1 months (based on UNFCCC 2012 in country review recommendation); change in livestock numbers.	0%	86.74	1%	38.87	2%	46.82	1%	11.03
4A4: Enteric Fermentation Goats	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4A6: Enteric Fermentation Horses	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4A8: Enteric Fermentation Swine	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4B1: Manure Management Cattle	Feed digestibility revised; ash value for cattle manure updated from 7.90 to 8.0%; updated cow milk yield data for 2009 and 2010; dairy cow live weights updated for the years 1997-2005 (based on UNFCCC 2012 in country review recommendation).	0%	-68.36	0%	-11.82	0%	-13.16	1%	-16.77
4B10: Manure Management Deer	Update to deer livestock numbers	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4B12: Liquid Systems	Updated cow milk yield data for 2009 and 2010.	0%	-0.10	0%	-0.02	0%	-0.02	0%	-0.02
4B13: Solid Storage and Drylot	Removed the upland lowland split for N excretion from ewes and lambs (based on UNFCCC 2012 in country review recommendation); updated provisional cow milk yield data for 2009 and 2010.	0%	-0.63	0%	-0.43	0%	-0.57	1%	-0.13
4B14: Other	Update to deer livestock numbers	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4B3: Manure Management Sheep	Correction to the lamb waste EF; lamb lifespan revised from 6 to 8.1 months (based on UNFCCC 2012 in country review recommendation); change in livestock numbers.	0%	-6.53	0%	-2.93	0%	-3.52	0%	-0.83
4B4: Manure Management Goats	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4B6: Manure Management Horses	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4B8: Manure Management Swine	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
4B9: Manure Management Poultry	No changes	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4D: Agricultural Soils	Updated DA crop area and fertiliser N rate time series; changes to grassland areas for NI (grass >5 years now includes rough grazing).	4%	317.00	8%	-6.32	6%	-36.41	12%	279.88
4F1: Field Burning of Agricultural Residues	Nitrogen-Carbon ratio updated from 0.012 to 0.015; correction to Dry Matter yield.	0%	0.00	0%	0.00	0%	0.00	0%	0.00
4F5: Field Burning of Agricultural Residues	Nitrogen-Carbon ratio updated from 0.012 to 0.015	0%	0.00	0%	0.00	0%	0.00	0%	0.00
5A: Forest Land (Biomass Burning)	Revised activity data on wildfires and inclusion of Dead Organic Matter in biomass burning; new activity data for drainage on forest soils.	0%	-20.90	0%	1.14	0%	221.19	0%	10.93
5A1: Forest Land Remaining Forest Land		0%	4.21	-12%	-0.79	0%	1.57	-2%	0.00
5A2: Land converted to forest land, forest land (N fertilisation)	Revised activity data on planting data leading to an increase in the area of relevant new planting.	0%	0.65	-4%	-0.03	0%	0.05	-1%	0.03
5B: Cropland (Biomass Burning)	Updated activity data: biomass and DOM losses following deforestation are now estimated from country-specific biomass densities.	0%	-2.10	0%	0.00	0%	0.00	0%	0.00
5B1: Cropland remaining cropland, liming	Adjustment of grass/cropland split for liming.	1%	-45.77	5%	-9.79	1%	-0.97	2%	0.00
5B2: Land Converted to Cropland, N2O emissions from disturbance associated with land-use conversion to cropland	Correction in compilation spreadsheet leading to decrease across some DAs.	1%	-119.14	6%	-100.79	1%	-28.87	3%	25.10
5C: Grassland (Biomass burning)	Updated activity data: biomass and DOM losses following deforestation are now estimated from country-specific biomass densities.	0%	-41.29	0%	8.15	0%	2.51	0%	-1.01
5C1: Grassland remaining grassland, Liming	Adjustment of grass/cropland split for liming.	0%	-27.39	-4%	-10.00	-1%	-7.67	-4%	0.01
5C2: Land converted to	New activity data for Forest Land converted to	-1%	112.11	-2%	31.81	-1%	3.60	-2%	2.38

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)	% of Total (2011)	2010 - 2010 (kt CO2e)
grassland	Grassland.								
5D1: Wetlands remaining wetlands	Activity data for 2009-2010 was updated with the latest published information on peat volume sales (ONS 2011).	0%	107.20	0%	32.41	0%	0.00	1%	-0.01
5D2: Land converted to wetlands, Non-CO2 emissions from drainage of soils and wetlands	New sector for carbon dioxide. Activity data for 2009-2010 was updated with the latest published information on peat volume sales (ONS 2011).	0%	0.00	0%	0.00	0%	0.00	0%	0.01
5E: Settlements (Biomass burning)	New activity data for deforestation	0%	-5.53	0%	-9.23	0%	-2.36	0%	-1.19
5E1: Settlements remaining settlements	No changes	0%	0.00	1%	0.00	1%	0.00	1%	0.00
5E2: Land converted to settlements	Updated activity data: biomass and DOM losses following deforestation are now estimated from country-specific biomass densities.	0%	-12.56	2%	25.14	1%	3.99	3%	-0.64
5G: Other (Harvested wood)	Revised deforestation activity data affecting the pool of harvested wood products	0%	49.81	-4%	-18.01	-2%	-0.17	-1%	0.00
6A1: Managed Waste Disposal on Land	No changes to the DA landfill method	3%	0.00	4%	0.00	2%	0.00	2%	0.00
6B1: Industrial Wastewater Handling	New estimates for industrial waste water treatment included in the UK inventory for the first time, in response to UNFCCC in-country review findings.	0%	1,082.84	0%	82.97	0%	66.73	0%	36.07
6B2: Wastewater Handling	Updates to methane emission factors from municipal waste water treatment plant, based on water company reporting.	0%	58.42	0%	0.06	0%	3.89	0%	3.58
6C: Waste Incineration	Revisions to UK inventory estimates to include data on emissions of nitrous oxide from chemical waste incineration.	0%	4.37	0%	-0.09	0%	0.09	0%	-0.03
Total % Check		100%		100%		100%		100%	

The rows below relate to International Aviation and Shipping. The significance is calculated using total CO2e emissions **including** international aviation and shipping. The calculations above do not include these sectors in the total CO2e emissions.

IPCC Sector	Reasons for change	England		Scotland		Wales		Northern Ireland	
		% of Total (2011)	2010 - 2010 (kt CO ₂ e)	% of Total (2011)	2010 - 2010 (kt CO ₂ e)	% of Total (2011)	2010 - 2010 (kt CO ₂ e)	% of Total (2011)	2010 - 2010 (kt CO ₂ e)
International aviation	Allocations between the DAs and the Overseas Territories, Crown Dependencies and where applicable Gibraltar have been revised and are now based on data on flights from each DA to these destinations.	7%	121.73	2%	-55.94	0%	-0.54	1%	-21.72
International shipping	Fuel use in international and domestic shipping have been revised in the latest inventory, with reductions of around 3% in the fuel use and emissions in the international shipping source category and several small increases in domestic shipping allocations for motorboats and personal watercraft. The inventory now includes new estimates for shipping between the UK and Gibraltar and OTs, but the reduction in fuel use in other international shipping out-weights the effects of these new sources.	1%	-127.34	3%	-31.37	3%	-22.46	2%	-8.47