Appendices

APPENDIX A: DEFINITION OF NFR CODES AND SECTOR CATEGORIES

The Sector Category "Other" is applied to 1A5b and 7A across all pollutants, as shown in the table below. Additional Sector Categories are included under "Other" for each pollutant. If a Sector Category is insignificant for a pollutant, then it is included within the "Other" category in the tables and graphs of the report. The specific Sector Categories included under "Other" for each pollutant are listed in each chapter of the report.

Table A1: Definition of NFR Codes and Sector Categories

NFR Code	NFR Source Description	Sector Category
1A1a	Public Electricity and Heat Production	Energy Industries
1A1b	Petroleum Refining	Energy Industries
1A1c	Combustion in Manufacture of Solid Fuels and Other Energy Industries	Energy Industries
1A2a	Combustion in Iron and Steel Manufacturing Industry	Industrial Combustion
1A2b	Combustion in Non-ferrous Metals Manufacturing Industry	Industrial Combustion
1A2c	Combustion in Chemical Manufacturing Industry	Industrial Combustion
1A2d	Combustion in Pulp, Paper and Print Manufacturing Industry	Industrial Combustion
1A2e	Combustion in Food Processing, Beverages and Tobacco Manufacturing Industry	Industrial Combustion
1A2fi	Stationary combustion in manufacturing industries and construction: Other (Please specify in your IIR)	Industrial Combustion
1A2fii	Mobile Combustion in manufacturing industries and construction: (Please specify in your IIR)	Industrial Combustion
1A3ai(i)	International Aviation -Take-Off and Landing	Transport Sources
1A3aii(i)	Civil Aviation - Domestic Take-Off and Landing	Transport Sources
1A3bi	Road Transport - Passenger Cars	Transport Sources
1A3bii	Road Transport - Light Duty Vehicles	Transport Sources
1A3biii	Road Transport - Heavy Duty Vehicles	Transport Sources
1A3biv	Road Transport - Mopeds & Motorcycles	Transport Sources
1A3bv	Road Transport - Gasoline Evaporation	Transport Sources
1A3bvi	Road Transport - Automobile Tyre and Brake Wear	Transport Sources
1A3bvii	Road Transport - Automobile Road Abrasion	Transport Sources
1A3c	Railways - Mobile Sources	Transport Sources
1A3dii	National Navigation (including Inland Waterways and Maritime Activities)	Transport Sources
1A4ai	Commercial / institutional: Stationary	Commercial, domestic and agricultural combustion
1A4bi	Residential Combustion Plants	Commercial, domestic and agricultural combustion
1A4bii	Household and Gardening (Mobile Machinery)	Commercial, domestic and agricultural combustion
1A4ci	Stationary Combustion Plants (Agriculture/Forestry/Fishing)	Commercial, domestic and agricultural combustion
1A4cii	Agricultural/Forestry Off-Road Vehicles and Other Machinery	Commercial, domestic and

NFR Code	NFR Source Description	Sector Category
		agricultural combustion
1A4ciii	National Fishing Activities	Commercial, domestic and agricultural combustion
1A5b	Other Mobile Sources (including Military)	Other
1B1b	Fugitive Emissions from Fuels - Solid Fuels/Transformation	Fugitive
1B2ai	Fugitive Emissions from Fuels, Oil - Exploration, Production, Transport	Fugitive
1B2aiv	Fugitive Emissions from Fuels, Refining/Storage	Fugitive
1B2av	Fugitive Emissions from Distribution of Oil Products	Fugitive
1B2b	Fugitive Emissions from Natural Gas Extraction	Fugitive
1B2c	Oil and Natural Gas/Venting and Flaring	Fugitive
2A1	Cement Production	Industrial Processes
2A4	Soda Ash Production and Use	Industrial Processes
2A6	Road Paving with Asphalt Production Processes	Industrial Processes
2A7a	Quarrying and mining of minerals other than coal	Industrial Processes
2A7b	Construction and demolition	Industrial Processes
2A7c	Storage, handling and transport of mineral products	Industrial Processes
2A7d	Other Mineral products (Please specify the sources included/excluded in the notes column to the right)	Industrial Processes
2B2	Nitric Acid Production	Industrial Processes
2B5a	Other chemical industry (Please specify the sources included/excluded in the notes column to the right)	Industrial Processes
2C1	Iron and steel production	Industrial Processes
2C3	Aluminum production	Industrial Processes
2C5a	Copper production	Industrial Processes
2C5b	Lead production	Industrial Processes
2C5d	Zinc production	Industrial Processes
2C5e	Other metal production (Please specify the sources included/excluded in the notes column to the right)	Industrial Processes
2D1	Pulp and Paper Production	Industrial Processes
2D2	Food and Drink Production	Industrial Processes
2D3	Wood processing	Industrial Processes
2G	Other Industrial Processes (including use of HFC, N2O, NH3, PFC & SF6)	Industrial Processes
3A1	Decorative coating application	Solvent Processes
3A2	Industrial coating application	Solvent Processes
3A3	Other coating application (Please specify the sources included/excluded in the notes column to the right)	Solvent Processes
3B1	Degreasing	Solvent Processes
3B2	Dry cleaning	Solvent Processes
3C	Chemical Products, Manufacture and Processing	Solvent Processes
3D1	Printing	Solvent Processes
3D2	Domestic solvent use including fungicides	Solvent Processes
3D3	Other product use	Solvent Processes
4B13	Manure Management - Other	Agriculture
4B1a	Manure Management - Dairy	Agriculture

NFR Code	NFR Source Description	Sector Category
4B1b	Manure Management - Non-Dairy	Agriculture
4B3	Manure Management - Sheep	Agriculture
4B6	Manure Management - Horses	Agriculture
4B8	Manure Management - Swine	Agriculture
4B9a	Laying hens	Agriculture
4B9b	Broilers	Agriculture
4B9d	Other poultry	Agriculture
4D1a	Synthetic N-fertilizers	Agriculture
4D2c	N-excretion on pasture range and paddock unspecified	Agriculture
4F	Field Burning of Agricultural Wastes	Agriculture
6A	Solid Waste Disposal on Land	Waste
6B	Waste Water Handling	Waste
6Ca	Clinical waste incineration (d)	Waste
6Cb	Industrial waste incineration (d)	Waste
6Cc	Municipal waste incineration (d)	Waste
6Cd	Cremation	Waste
6Ce	Small scale waste burning	Waste
6D	Other Waste (including Composting and Biogas Production)	Waste
7A	Other (included in national total for entire territory)	Other

APPENDIX B: METHODS FOR CALCULATING EMISSION DISTRIBUTIONS

For a more detailed description of the integration of point source data analysis and the development of UK emission maps, see Tsagatakis et al. (2013).

This report outlines in detail the analysis conducted to analyse known point source emissions data, and derive the 'area' emission sources that make up the remaining component of UK emission totals. These area sources are then disaggregated geographically across the UK using a range of methods according to available data for the source in question. The geographical distribution of emissions across the UK is then built up from distributions of emissions in each source sector.

For large industrial point sources, emissions are compiled from a variety of official UK sources (Environment Agency, Scottish Environment Protection Agency, Northern Ireland Environment Agency, DECC Offshore Inspectorate, Local Authorities). The area source distribution maps are generated using appropriate surrogate statistics for that sector, commonly using local activity statistics such as raw material use, energy use, industrial production and employment data, housing and population data, road vehicle and fuel sales data, periodic census or socio-economic survey data.

Total emissions from road transport in each Devolved Administration (DA) region are calculated from the following information:

- Emission factors (g/m) for different types of vehicles, which depend on the fuel type (petrol or diesel) and are influenced by the drive cycle or average speeds on the different types of roads;
- Traffic activity for each DA region, including distance and average speed travelled by each type of vehicle on each type of road;
- DA-specific fleet data on petrol/diesel car mix, car engine size and fleet composition (i.e. age distribution) for cars, light goods vehicles (LGVs) and rigid heavy goods vehicles (HGVs) based on data from the Driver and Vehicle Licensing Agency (DVLA); the age of the fleet determines the proportion of vehicles manufactured in conformity with different exhaust emission regulations;

There are a number of changes made to the 2011 UK road transport inventory and thus affecting the DA inventories:

- The Department for Transport (DfT) has revised minor road vehicle km estimates between 2000 and 2010 for England and Wales as a result of a benchmarking exercise planned in 2010.
- Revised 2010 vehicle km activity data for Northern Ireland as provided by the Department for Regional Development.
- Revised assumption on the distribution of vehicle km between artic 34-40t and 40-50t weight classes across the whole time series, based on bespoke licensing statistics provided by the DfT.
- Updated London bus fleet composition data as provided by Transport for London in July 2012.
- Corrected NOx emission factors for small LGVs N1 (I) which are now based on medium sized-car emission factors.
- Revised PM and total hydrocarbon (THC) emission factors which are now based on COPERT 4 v9.0.

The 2011 inventory estimates from the rail sector are derived using an improved methodology that is based on information from the Department for Transport Rail Emission Model (REM). This has affected assumptions on the breakdown of fuel use between freight, intercity and regional rail, and also the emission factors used, and thus affecting the DA inventories. Further information on the new rail sector emission estimation methodology can be found in the "UK Informative Inventory Report 1980 to 2011" (Passant et al., 2013). Emissions from forests and land use change have been estimated using maps that have been updated using the latest release of the Land Cover Maps (http://www.ceh.ac.uk/landcovermap2007.html) from CEH.

Table B1 provides a simple overview of the different data used to map the SNAP sectors, whilst Table B2 below provides a more detailed insight into the disaggregation methodologies used to compile the DA air quality pollutant inventories. Table B2 is presented using the Nomenclature for Reporting (NFR) structure, which is the format currently required for the submission under the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP).

Table B1: Methods used to Map Emissions in each of the 11 UNECE Source Sectors

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

Table B2: Disaggregation Methodologies for compiling the DA Air Quality Pollutant Inventories

NFR Sector	Source	Disaggregation Method
1A1a	Public electricity and heat production (all fuels)	All emissions are derived from the point source database, which is based on annual emissions estimates reported to UK environmental regulators by IPC/IPPC-regulated industry and (since 2005) fuel use data available from the EU ETS. Environment Agency (2012a,b), SEPA (2012a,b), NIEA (2012a,b)
1A1b	Petroleum refining (all fuels)	Point source data provided by plant operators to IPC/IPPC pollution inventories (see 1A1a). Further detail on combustion and process emissions provided by UKPIA (2012).
1A1c	Coke & SSF production (all fuels)	Point source data provided by plant operators (see 1A1a). Regional iron & steel production and fuel use data (ISSB, 2012). UK fuel use data from DECC (2012a).
	Nuclear fuel production (all fuels)	All emissions are in England
	Colliery combustion and colliery methane production (all fuels)	Deep mined coal production, data from the Coal Authority (2012).
	Gas production, downstream network (all fuels)	EUETS installation data for natural gas use from 2005-2011. All other years estimated based on the DA share from the 2005 EUETS data. Environment Agency (2012a,b), SEPA (2012a,b), NIEA (2012a,b)
	Upstream oil & gas, including gas separation plant (all fuels)	DECC Offshore Inspectorate (2012) EEMS inventory. Point source data for NO_x, SO_2, VOC. (CO and PM_{10} assumed same as SO_2.)
1A2a	Blast furnaces & sinter plant	Point source data provided by plant operators (see 1A1a), supplemented by site-specific breakdown of emissions from Tata Steel (2012).
	Iron & steel combustion plant (all fuels)	Regional iron & steel production and fuel use data (ISSB, 2012) used to inform estimates to 2004. 2005 onwards derived from activity data from EU ETS.
1A2b	Combustion in non-ferrous metals manufacturing industry	Emissions analysis for 2011: Pollution Inventory (EA 2012a, SEPA 2012a, NIEA 2012a), EU ETS (EA 2012b, SEPA 2012b, NIEA 2012b) IDBR and employment data (ONS, 2012). Overall analysis of the

NFR Sector	Source	Disaggregation Method
1A2c	Combustion in chemical manufacturing industry	1A2b,c,d,e and f sectors used to constrain the DA totals to previous 1A2 DA estimates, using 1A2f Other Industry as residual. Detailed analysis conducted for 2008-2011; 1A2b,c,d,e 1990-2008 DA trends matched with UK trends due to data limitations for the detailed industry sub-sector activities at DA level. (See above – method for 1A2b,c,d,e and f integrated.)
1A2d	Combustion in paper, pulp and print manufacturing industry	
1A2e	Combustion in food processing, beverages and tobacco manufacturing industry	
1A2f	Refractory & ceramic production	Regional GDP data (ONS, 2012).
	Autogenerators (coal)	All emissions in England.
	Lime, cement, brick and ammonia production (all fuels)	Point source data from plant operators (see 1A1a). All lime production and ammonia production in England.
	Other industrial combustion (oils)	Sub-national energy statistics, DECC (2012b), and analysis of point source data derived from EU ETS and IPPC data. Environment Agency (2012a,b), SEPA (2012a,b), NIEA (2012a,b). Overall analysis of the 1A2b,c,d,e and f sectors used to constrain the DA totals to previous 1A2 DA estimates, using 1A2f Other Industry as residual.
	Other industrial combustion (SSF, coke)	
	Other industrial combustion (coal)	
	Other industrial combustion & auto-generators (gas)	Natural gas consumption data from gas network operators: Transco (2012), Northern Gas Networks (2012), Scotia Gas Networks (2012), Wales & West Utilities (2012), Phoenix Natural Gas (2012), Firmus Energy (2012), Vayu (2012). Sub-national energy statistics, DECC (2012b), and analysis of point source data derived from EU ETS and IPPC data. Environment Agency (2012a,b), SEPA (2012a,b), NIEA (2012a,b).
	Industrial off-road machinery (all fuels)	Sub-national energy statistics (DECC, 2012b) and DA GDP data (ONS, 2012).
1A3ai (i)	Aircraft – international take-off and landing (all fuels)	CAA (2012), UK airport statistics. All take-off and landing cycle emissions for each flight assigned to DA of origin airport.
1A3aii (i)	Aircraft – domestic take-off and landing (all fuels)	
1A3bi to 1a3bvii	Road Transport	Vehicle km, DfT, NI Department for Regional Development (DRD) Emission factors: Boulter et al. (2009) COPERT 4 (EEA, 2012b) Fuel efficiency: Road Freight Statistics, DfT (2011)

NFR Sector	Source	Disaggregation Method
		Composition of fleet: Vehicle Licensing Statistics Report, DfT (GB) Dept of Regional Development (NI). Traffic data: National Traffic Census, DfT (England, Scotland, Wales: 1990-2011) Dept of Regional Development (NI: 1990-1999), Traffic Census Report (NI: 2000), Vehicle Kilometres of Travel Survey of Northern Ireland Annual Report (NI: 2001), Traffic and Travel Information, DRDNI (NI: 2002- 2011) Fuel consumption: Digest of UK Energy Statistics (1990-2011),
1A3c	Railways: intercity, regional and freight	UK specific emission factors in g/vehicle (train) km are taken from the Department for Transport's Rail Emissions Model (REM) for different rail engine classes based on factors provided by WS Atkins Rail. Data from UKPIA on sulphur content of gas oil. Gas oil consumption data from Office of Rail Regulation for passenger and freight trains for 2005-2009 combined with trends in train km to estimate consumption for other years. Train km data from REM are used to provide the breakdown between train classes. Fuel consumption: Digest of UK Energy Statistics (1990-2011)
1A3dii	Coastal shipping (gas oil, fuel oil)	Port movement data, DfT (2012b) Maritime Statistics.
1A3eii	Aircraft support vehicles (gas oil)	Regional aircraft movements, DfT (2012d)
1A4a	Railways – stationary combustion	Sub-national energy statistics, DECC (2012b)
	Industrial & commercial combustion	Sub-national energy statistics, DECC (2012b), and analysis of point source data and public and commercial mapping grids from regional employment data by sector. Gas use data supplemented by data from gas network operators (same references as 1A2f). PSEC data (DFPNI 2011) used to inform the N Ireland estimates.
	Public sector combustion	
1A4bi	Domestic combustion	For coal, anthracite, petroleum fuels, analysis is from sub-national energy statistics, DECC (2012b) and Housing Condition Survey data. Domestic peat combustion data from CEH (Personal communication, 2012). Gas use data provided by gas network operators (same references as 1A2f).

NFR Sector	Source	Disaggregation Method
1A4bii	Household and gardening mobile machinery (all fuels)	Regional dwellings data, ONS (2012).
1A4ci	Agriculture – Stationary combustion	Agricultural employment data, Defra (2012a) used for allocation of solid and gaseous fuels. Regional energy statistics, DECC (2012b) used for petroleum-based fuels. N Ireland gas use data for agriculture sector based on 2005 estimate for the sector provided by Phoenix Natural Gas (2007)
1A4cii	Agriculture – mobile machinery	Agricultural off-road mapping grid, with overall petroleum fuel allocations constrained to the DECC sub-national energy data (DECC, 2012b)
1A4ciii	Fishing vessels	Port movement data, DfT (2012b) Maritime Statistics
1A5b	Military aircraft and naval shipping	Regional GDP data (ONS, 2012).
1B1a	Deep-mined coal	Regional deep mine production, Coal Authority (2012). Emissions from closed coal mines derived from WSP report (Fernando, 2011)
1B1b	Coke & SSF production	Coal feed to coke ovens, ISSB, WS, DECC and (1999-2004) PI. 2005 onwards: EU ETS (EA 2012b, SEPA 2012b, NIEA 2012b)
	Iron & steel flaring	Coal feed to coke ovens, ISSB, WS, DECC and (1999-2004) PI. 2005 onwards: EUETS (EA 2012b, SEPA 2012b, NIEA 2012b)
1B2ai	Offshore oil & gas: offshore oil loading, well testing.	All emissions unallocated.
	Offshore oil & gas: process emissions, onshore oil loading, oil terminal storage	Emissions derived from the DECC Offshore Inspectorate (2012) EEMS point source dataset, with extrapolations back to cover 1990, 1995 where data gaps are evident.
1B2aiv	Refinery process emissions (drainage, tankage, general)	Point source data provided by plant operators (see 1A1a), UKPIA (2012) and analysed using the NAEI point source database.
1B2av	Petrol terminal storage and loading, Refinery road and rail haulage emissions	Point source data provided by plant operators (see 1A1a).

NFR Sector	Source	Disaggregation Method
	Petrol station emissions from delivery, vehicle refuelling, storage tanks and spillages	Regional road transport distribution based on analysis of vehicle km data for different vehicle types and the resultant fuel use distributions. Hence, references as 1A3b.
1B2b	Onshore gas production (gasification process emissions)	Point source data provided by plant operators (see 1A1a).
	Gas leakage from supply infrastructure	Leakage data provided by gas network operators: Transco (2012), Northern Gas Networks (2012), Scotia Gas Networks (2012), Wales & West Utilities (2012), Phoenix Natural Gas (2012).
1B2c	Offshore oil & gas: flaring & venting	Emissions derived from the DECC Offshore Inspectorate (2012) EEMS point source dataset, with extrapolations back to cover 1990, 1995 where data gaps are evident.
	Refinery flaring	Point source data provided by plant operators (see 1A1a).
2A1	Cement decarbonising	Point source data provided by plant operators (see 1A1a).
	Concrete batching	Regional GDP data (ONS, 2012).
	Slag cement production	Slag cement production mapping grid
2A2	Lime production decarbonising	Point source data provided by plant operators (see 1A1a).
2A3	Limestone & dolomite use in: inter plant, glass production, and basic oxygen furnaces. FGD emissions from power stations.	Point source data provided by plant operators (see 1A1a).
2A4	Soda ash use in glass and chemical industries	Point source data provided by plant operators (see 1A1a).
2A7	Construction, asphalt manufacture	Regional GDP data (ONS, 2012).
	Quarrying (aggregates)	Quarries mapping grid.
	Glass industry process emissions	Point source data provided by plant operators and from EU ETS (see 1A1a).
2B1	Ammonia production	All ammonia production now in England. Point source emissions data and plant capacity data used for earlier years.
2B2	Nitric acid production	Point source data provided by plant operators (see 1A1a). Now all England.

NFR Sector	Source	Disaggregation Method
2B3	Adipic acid production	Point source data provided by plant operators (see 1A1a). All England.
2B5	Ship purging	All emissions unallocated.
	Chemical industry process emissions	Point source data provided by plant operators (see 1A1a).
2C	Industrial process emissions from SMEs, hot & cold steel rolling emissions	Regional GDP data (ONS, 2012).
	Process emissions from: blast furnaces, EAFs, BOFs, primary aluminium production & anode baking, alumina production, non-ferrous metal processes	Point source data provided by plant operators (see 1A1a), plus supplementary data provided by Tata Steel (2012) and the ISSB (2012)
	Flaring & stockpile emissions at iron & steelworks	Regional iron & steel production and fuel use data (ISSB, 2012).
	Foundries	Foundries mapping grid
2D1	Paper production process emissions	Regional GDP data (ONS, 2012).
	Wood product process emissions	Wood coating mapping grid.
2D2	Cider & wine manufacture	All emissions are in England.
	Spirit manufacture	Spirits mapping grid
	Brewery emissions	Brewing mapping grid
	Food & drink process industries: meat & fish, margarine, cakes & biscuits, animal feed, coffee roasting	Population used to disaggregate emissions.
	Other food & drink processes: bread baking, sugar beet, malting.	Point source data provided by plant operators (see 1A1a).
3	Solvent use	Population data, ONS (2012).
3A	Trade & retail decorative paints,	Population data, ONS (2012).

NFR Sector	Source	Disaggregation Method
	Industrial coatings: commercial vehicles, aircraft, agricultural and construction vehicles.	Regional GDP data (ONS, 2012).
	Industrial coatings: wood, metal, plastic, marine, vehicle refinishing.	Various coatings mapping distribution grids are used based on surveys of locations of such processes.
	Industrial coatings: coil, metal packaging, automotive, drum	Point source data provided by plant operators (see 1A1a).
3B	Domestic surface cleaning.	Population data, ONS (2012).
	Dry cleaning (solvent use)	Dry cleaning mapping grid
	Industrial surface cleaning	Industrial employment mapping distribution grid.
3C	Rubber & plastic products	Population data, ONS (2012).
	Leather coating and degreasing	Regional GDP data (ONS, 2012).
	Tyre manufacture and industrial coatings: textiles, film.	Point source data provided by plant operators (see 1A1a).
	Industrial coating manufacture: adhesives, inks, solvents and pigments	Various industry-specific coatings mapping distribution grids
3D	Industrial adhesives and solvent use, printing, aerosol and non-aerosol products (cosmetics & toiletries, household products, paint thinners),	Population data, ONS (2012).
	Printing – public gravure	Other printing mapping grid
	Road dressings	Road dressing mapping grid.
	Agrochemical use, wood impregnation	Various agricultural mapping distribution grids
	Seed oil extraction, paper coatings, and some adhesive and printing processes.	Point source data provided by plant operators (see 1A1a).

NFR Sector	Source	Disaggregation Method
4B1	Manure management - cattle	Livestock data, via Rothamsted Research (2012) For NH_3, specific DA splits for manure management, based on regional emissions data for 1990, 1995, 2000-2011 provided by Rothamsted Research
4B3	Manure management – sheep and goats	Livestock data, via Rothamsted Research (2012) For NH_3, specific DA splits for manure management, based on regional emissions data for 1990, 1995, 2000-2011 provided by Rothamsted Research
4B6	Manure management – horses	Livestock data, via Rothamsted Research (2012)
4B8	Manure management – swine	Livestock data, via Rothamsted Research (2012) For NH_3, specific DA splits for manure management, based on regional emissions data for 1990, 1995, 2000-2011 provided by Rothamsted Research
4B9	Manure management – poultry	Livestock data, via Rothamsted Research (2012) For NH_3, specific DA splits for manure management, based on regional emissions data for 1990, 1995, 2000-2011 provided by Rothamsted Research
4B13	Manure management – domestic pets	2011 Mapping data from CEH (Dragosits U. et al., 2013) and population data, ONS (2012).
4D1	Use of domestic fertiliser & composting	Population data, ONS (2012). For NH_3, specific DA splits for fertiliser use, based on regional emissions data for 1990, 1995, 2000-2011 provided by Rothamsted Research
	Agricultural soil emissions	Rothamsted Research (2012), livestock data and fertiliser application data. For NH_3, specific DA splits for agricultural soils, based on regional emissions data for 1990, 1995, 2000-2011 provided by Rothamsted Research
4F	Field burning of agricultural wastes	Field burning estimates, via Rothamsted Research (2012)
6A	Landfills, benzoles & tars	Regional landfill MSW disposal data (www.wastedataflow.org), combined with DA-specific landfill model developed by the Defra Waste team (Defra, 2012b).
6B	Sewage sludge decomposition	Population data, ONS (2012).

NFR Sector	Source	Disaggregation Method
6C	Clinical waste incineration, small-scale waste burning	Population data, ONS (2012).
	Incineration: MSW, crematoria, sewage sludge, chemical waste	Point source data provided by plant operators (see 1A1a).
	Foot & mouth pyres	Data on livestock disposal, NAO (2002).
6D	Other waste (including composting and biogas production)	Population data, ONS (2012).
7	Cigarettes, fireworks & bonfires	Population data, ONS (2012).