European Environment Agency

Manual for the European Environment Agency's Air Pollutant Emissions Data Viewer (LRTAP Convention)

This manual provides details on the scope, content and features of the European Environment Agency's (EEA) Air pollutant emissions data viewer (LRTAP Convention).

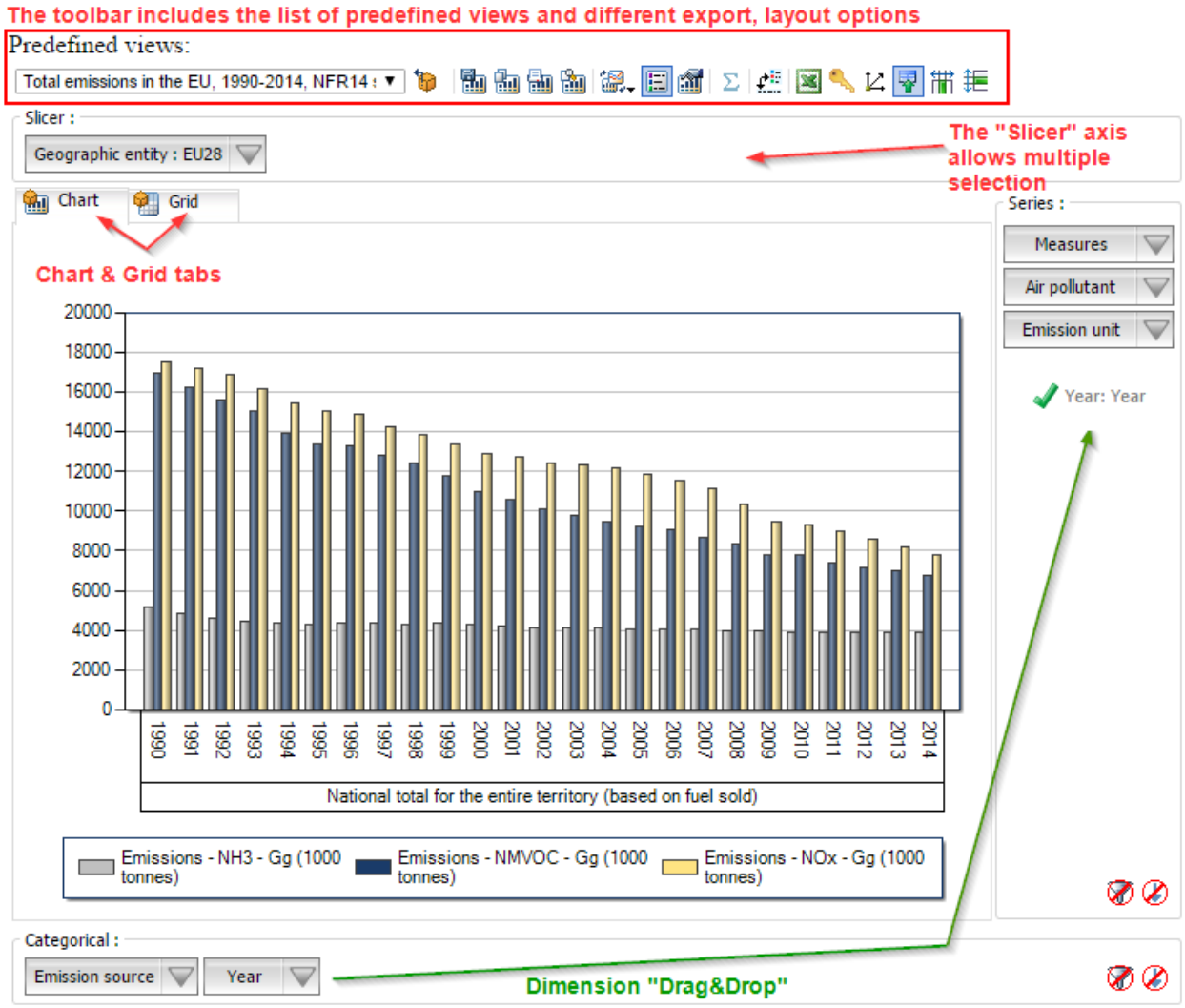
This viewer is a user-friendly tool which allows visualising and downloading of data submitted by EEA member countries and cooperating countries to the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP Convention) for the period 1990 – 2014.

Where gaps exist in the data supplied by the EU Member States to the EEA, the emissions of air pollutants (SO_x, NO_x, CO, NMVOC and NH_3) officially reported by Member States under the National Emissions Ceilings Directive (2001/81/EC) and/or the EU Greenhouse Gas Monitoring Mechanism (280/2004/EC) have been used to fill gaps where possible. Remaining gaps are filled using a combination of extrapolation and interpolation techniques – further details are provided in the aforementioned inventory report.

The manual is organised as follows:

1 General data viewer navigation

The diagram below represents some main elements and functionalities of the data viewer.



- **Predefined views:**

The “Predefined views” drop down menu allows switching between defaults predefined views.
Six “Predefined views” are available from the menu.

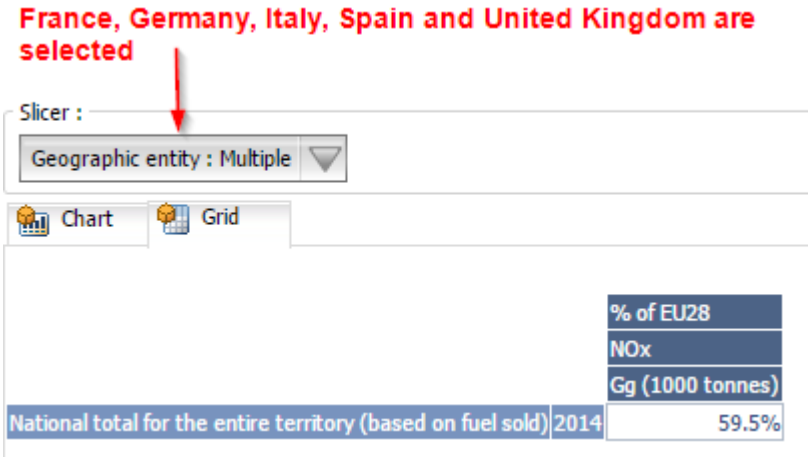
- **Dimensions:**

The data viewer counts six different dimensions:
“Air pollutant”, “Emission unit”, “Year”, “Measures”, “Emission source” and “Geographic entity”. Each dimension can be arranged within each axis (drag and drop).

- **Axis:** three distinct axis “Slicer”, “Series” and “Categorical”.

Note: the “Filter/Slicer” allows multiple member selection, and therefore offers many possibilities in terms of aggregation.

Example: The screen shot below can be read: “Emissions of NOX in France, Germany, Italy, Spain and United Kingdom accounts for 59.5% of total emissions in the EU-28 in 2014”.



Chart/Grid tabs: the “Chart/Grid” tabs allow easy switch between chart view and grid view.

2 Scope of the viewer

2.1 Air pollutants

The table below lists the air pollutants for which emissions data are available in the dataviewer.

Air pollutants	
Ammonia	NH_3
Back carbon	BC
Non-methane volatile organic compounds	NMVOC
Nitrogen oxides	NO_x
Sulphur dioxide	SO_2
Particulate matter <= 10 µm	PM_{10}
Particulate matter <= 2.5 µm	$PM_{2.5}$
Carbon monoxide	CO
Cadmium	Cd
Lead	Pb
Mercury	Hg
Dioxins and furans	Dioxins & furans
Hexachlorobenzene	HCB
Polychlorinated biphenyls	PCB
Total polycyclic aromatic hydrocarbons	total PAH
Arsenic	As
Benzo(a)pyrene (BaP)	benzo(a)
Benzo(b)fluoranthene	benzo(b)
Benzo(k)fluoranthene	benzo(k)
Chromium	Cr
Copper	Cu
Indeno(1,2,3-cd)pyrene	Indeno
Nickel	Ni
Selenium	Se
Total suspended particulate	TSP
Zinc	Zn

2.2 Geographic entities

Data are available for the EEA-33 member countries of EEA. As well as for EU-28 and EEA-33 country aggregates.

EU-28: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Spain, Slovak Republic, Slovenia, Sweden and the United Kingdom.
EEA-33: EU-28 Member States + Iceland, Liechtenstein, Norway, Switzerland and Turkey.

2.3 Emission source – NFR14 sectors

The Nomenclature for Reporting (NFR14) reporting format was developed by EMEP/TFEIP. At its thirty-second session in December 2013, the Executive Body of the LRTAP Convention adopted revised guidelines for reporting emissions and projections data (ECE/EB.AIR/122/Add.1, decisions 2013/3 and 2013/4). Revised 2014 Reporting Guidelines (ECE/EB.AIR.125 [PDF, 194KB]) are adopted for application in 2015 and subsequent years. The format uses around 100 categories to describe emission sources, and is consistent with the common reporting format (CRF) sector classification system developed by the UNFCCC/IPCCC for the reporting of greenhouse gases.

To simplify use of the data for assessment, NFR14 data can also be converted in the viewer into a simpler sector format (EEA sectors). The EEA sectors represent an aggregation of the ca. 100 NFR14 source categories into around 10 aggregated sectors. Details of the mapping used to convert NFR14 to the aggregated EEA sectors is provided in Annex I of this document. The easiest way to change between the different sector codes (i.e. between NFR14 and the EEA sectors) is to select the desired choice using the 'predefined view' selection box.

2.4 Total emissions

The "National Total for the entire territory" presented in the Data viewer comprises the aggregated NFR14 sectors (excluding memo items) reported by countries corresponding to anthropogenic (man-made) emissions. Natural emission sources (e.g. wind-blown dust) and re-suspension (e.g. the re-suspension of road-side particulate matter) are not included in the reported national totals.

2.5 Years

Emission data are reported annually. Data are in principle available for 30 years (from 1980 to 2014) for the main pollutants (CO, NH_3, NO_x, NMVOC, SO_2), although not every country has reported emissions of each pollutant for all these years. In general the most complete data are available from 1990 for the pollutants and these are therefore presented in the data viewer. For the EU-28 Member States, where gaps existed in the LRTAP data supplied by the Member States to the EEA, the emissions of air pollutants (SO_x, NO_x, CO, NMVOC and NH_3) officially reported by Member States under the National Emissions Ceilings Directive (2001/81/EC) and/or the EU Greenhouse Gas Monitoring Mechanism (280/2004/EC) have been used to fill gaps where possible.

2.6 Emissions ceiling for 2010

The viewer also shows the 2010 emissions ceilings for national totals (for NO_x, NMVOC, SO_x and NH_3) where these are defined for Parties that have ratified the Gothenburg Protocol of the UNCE LRTAP Convention to abate acidification, eutrophication and ground-level ozone. The text of the Gothenburg Protocol provides further information concerning the ceilings, for details please refer here.

2.7 Emission unit

Emissions can be visualized in 4 distinct scales:

- in gram (g);
- in kilograms (kg);
- in megagrams (Mg) 1 Mg = 1 tonne = 1 000 kg;
- in gigagrams (Gg) 1 Gg = 1 000 tonnes = 1 000 000 kg;

This allows the user to adjust the unit relevant to displayed emission data. For example, the unit *Gg* is most relevant to view “National Total for the entire territory” emissions, while selecting the unit *kg* might be more relevant to view emissions for a specific sub-sector or pollutant (e.g. dioxins and furans).

Note: As "Emission unit" entries are linked with the emissions data, selecting any measure other than absolute emissions statistics (for example: % change or index…) is independent of the unit selected.

2.8 Statistics

The viewer can display data of different types including emission trends (expressed in absolute values or indexed to 1990 emissions levels), and the absolute or relative change from one year to another (expressed as a percentage).

2.8.1 Emissions: air pollutants emissions and notation keys

Emissions can be displayed in 4 units, according to the "emission unit" selected (see **2.7 Emission unit**). When an emission for a certain sector has not been reported for various reasons, Member States use notation keys (see table below).

Notation key	Definition
IE	**Included elsewhere**: for emissions by sources of compounds that are estimated but included elsewhere in the inventory instead of in the expected source category.
NA	**Not applicable**: is used for activities in a given source category which are believed not to result in significant emissions of a specific compound.
NE	**Not estimated**: for existing emissions by sources of compounds that have not been estimated.
NO	**Not occurring**: for emissions by sources of compounds that do not occur for a particular compound or source category within a country.
NR	**Not reported:** is introduced to ease the reporting where emissions for a specific Party are not strictly required by the different Protocols.
C	**Confidential:** is used for emissions that are aggregated and included elsewhere in the inventory, because reporting at a disaggregated level could lead to the disclosure of confidential information.

2.8.2 Percentage change

Four different percentage change statistics are available. In the formulas below, E_{year} represents the selected year emission.

Statistic	Definition	Formula (E_{year} = selected year emission)
% change compared to 1990	Percentage change between 1990 and selected year emissions	$(E_{year} – E_{1990})/ E_{1990})*100$
Distance to Gothenburg ceilings	Percentage change required to E_{year} in order that the 2010 ceilings are met (for NO_x, NMVOC, SO_2 and NH_3 only). **Note:** a negative value implies that E_{year} is already below the respective ceiling	$(E_{year} - E_{ceiling\ 2010})/ E_{ceiling\ 2010})*100$
Annual % change (Y vs. Y – 1)	Percentage change between previous year and selected year emissions	$((E_{year} – E_{year-1})/ E_{year-1})*100$
10-year % change (Y vs. Y – 10)	Percentage change in emissions during the 10-year period preceding the selected year	$((E_{year} – E_{year-10})/ E_{year-10})*100$

Examples: The screen shot below can be interpreted: "*In 2014, total NH_3 emissions in the EU-28 were 4.8% lower than 10 years before (in 2004)*".

		10-year % change (Y vs. Y-10)
		NH3
		EU28
National total for the entire territory (based on fuel sold)	2014	-4.8%

The screen shot below can be interpreted: *"French Total emissions of NOx in 2014 have met its Gothenburg ceiling in 2014 as emissions are 13.9% lower than the ceiling".*

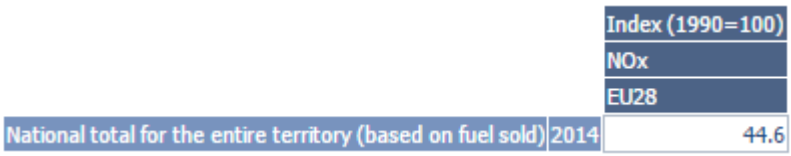
		Distance to Gothenburg ceilings
		NOx
		France
National total for compliance assessment (please specify all details in the IIR)	2014	-13.9%

2.8.3 Index

Three index measure.

Statistic	Definition	Formula (E_{year} = selected year emission)
Index (1990=100)	Index of current year emissions, with index 100 = 1990 emissions	$(E_{year} / E_{1990})*100$
Index (2000=100)	Index of current year emissions, with index 100 = 2000 emissions	$(E_{year} / E_{2000})*100$
Index (2010=100)	Index of current year emissions, with index 100 = 2010 emissions	$(E_{year} / E_{2010})*100$

Example: The screen shot below can be interpreted: "*For EU-28 in 2014, the index of total NO_x emissions with 100 being emissions for 1990 stands at 44.6, this represents an decrease of 55.4% compared to 1990"*.

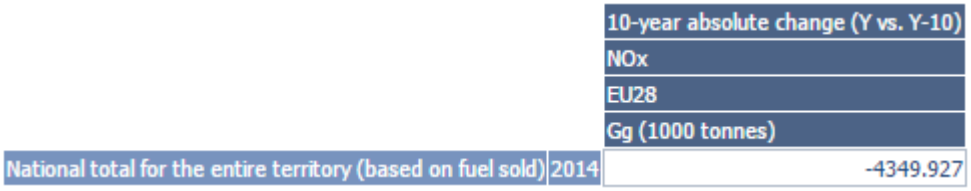


2.8.4 Emission change

Three different calculations of emissions change in absolute terms are available. In the formulas below, E_{year} represents current year emission. See also **2.7 Emission unit**.

Statistic	Definition	Formula (E_{year} = selected year emission)
Absolute change compared to 1990	Change in absolute emissions between 1990 and current year displayed	$E_{year} – E_{1990}$
Annual absolute change (Y vs. Y-1)	Change in absolute emissions between previous year and current year displayed	$E_{year} – E_{year-1}$
10-year absolute change (Y vs. Y-10)	Change in absolute emissions during the 10-year period preceding the selected year	$E_{year} – E_{year-10}$

Example: The screen shot below can be interpreted: *"For EU-28, Total NO_x emissions decreased by 4349.927 Gg between 2004 and 2014"*.



Note: The "Emission unit" dimension is relevant for the "emission change statistics" - switching between the "Emission unit" options (g, Kg, Mg, Gg) will change the unit of the displayed emissions.

2.8.5 Percentage share

Three different percentage share statistics are available.

Statistic	Definition	**Formula** (E_{sector} = selected sector emission) ($E_{country}$ = selected national total emission)
Share of National Total emissions (%)	Percentage share of sector emission in National Total emissions for the selected years(s)	(E_{sector} / National Total emissions)*100
% of EEA-33	percentage share of selected country emission in the EEA-33 for the selected years(s)	($E_{country}$ / E_{EEA-33})*100
% of EU-28	percentage share of selected country emission in the EU-28 for the selected years(s)	($E_{country}$ / E_{EU-28})*100

Examples:

The screen shot below can be interpreted: *"Denmark accounts for 1.7% of all EU-28 Total Particulate Formation PM_{10} emissions in 2014"*.

		% of EU28
		PM10
		Denmark
National total for the entire territory (based on fuel sold)	2014	1.7%

The screen shot below can be interpreted: *"The sector "1A1a Public Electricity and Heat Production" represents 47.0% of SO_x emissions in the EU-28 in 2014"*.

		Share of National Total emissions (%)
		SOx
		EU28
1A1a Public electricity and heat production	2014	47.0%

ANNEX I - Mapping NFR14 sectors classification and EEA sectors

Sector code an label NFR14	**Sector label EEA**
1A1a Public electricity and heat production	Energy production and distribution
1A1b Petroleum refining	Energy production and distribution
1A1c Manufacture of solid fuels and other energy industries	Energy production and distribution
1A2a Stationary combustion in manufacturing industries and construction: Iron and steel	Energy use in industry
1A2b Stationary combustion in manufacturing industries and construction: Non-ferrous metals	Energy use in industry
1A2c Stationary combustion in manufacturing industries and construction: Chemicals	Energy use in industry
1A2d Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	Energy use in industry
1A2e Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	Energy use in industry
1A2f Stationary combustion in manufacturing industries and construction: Non-metallic minerals	Energy use in industry
1A2gvii Mobile Combustion in manufacturing industries and construction	Energy use in industry
1A2gviii Stationary combustion in manufacturing industries and construction: Other	Energy use in industry
1A3ai(i) International aviation LTO (civil)	Non-road transport
1A3aii(i) Domestic aviation LTO (civil)	Non-road transport
1A3bi Road transport: Passenger cars	Road transport
1A3bii Road transport: Light duty vehicles	Road transport
1A3biii Road transport: Heavy duty vehicles and buses	Road transport
1A3biv Road transport: Mopeds & motorcycles	Road transport
1A3bv Road transport: Gasoline evaporation	Road transport
1A3bvi Road transport: Automobile tyre and brake wear	Road transport
1A3bvii Road transport: Automobile road abrasion	Road transport
1A3c Railways	Non-road transport
1A3di(ii) International inland waterways	Non-road transport
1A3dii National navigation (shipping)	Non-road transport
1A3ei Pipeline transport	Non-road transport
1A3eii Other	Non-road transport

Sector code an label NFR14 (continued)	Sector label EEA
1A4ai Commercial/institutional: Stationary	Commercial, institutional and households
1A4aii Commercial/institutional: Mobile	Commercial, institutional and households
1A4bi Residential: Stationary	Commercial, institutional and households
1A4bii Residential: Household and gardening (mobile)	Commercial, institutional and households
1A4ci Agriculture/Forestry/Fishing: Stationary	Commercial, institutional and households
1A4cii Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	Commercial, institutional and households
1A4ciii Agriculture/Forestry/Fishing: National fishing	Non-road transport
1A5a Other stationary (including military)	Commercial, institutional and households
1A5b Other, Mobile (including military, land based and recreational boats)	Commercial, institutional and households
1B1a Fugitive emission from solid fuels: Coal mining and handling	Energy production and distribution
1B1b Fugitive emission from solid fuels: Solid fuel transformation	Energy production and distribution
1B1c Other fugitive emissions from solid fuels	Energy production and distribution
1B2ai Fugitive emissions oil: Exploration, production, transport	Energy production and distribution
1B2aiv Fugitive emissions oil: Refining / storage	Energy production and distribution
1B2av Distribution of oil products	Energy production and distribution
1B2b Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	Energy production and distribution
1B2c Venting and flaring (oil, gas, combined oil and gas)	Energy production and distribution
1B2d Other fugitive emissions from energy production	Energy production and distribution
2A1 Cement production	Industrial processes and product use
2A2 Lime production	Industrial processes and product use
2A3 Glass production	Industrial processes and product use
2A5a Quarrying and mining of minerals other than coal	Industrial processes and product use
2A5b Construction and demolition	Industrial processes and product use
2A5c Storage, handling and transport of mineral products	Industrial processes and product use
2A6 Other mineral products	Industrial processes and product use

Sector code an label NFR14 (continued)	Sector label EEA
2B1 Ammonia production	Industrial processes and product use
2B10a Chemical industry: Other	Industrial processes and product use
2B10b Storage, handling and transport of chemical products	Industrial processes and product use
2B2 Nitric acid production	Industrial processes and product use
2B3 Adipic acid production	Industrial processes and product use
2B5 Carbide production	Industrial processes and product use
2B6 Titanium dioxide production	Industrial processes and product use
2B7 Soda ash production	Industrial processes and product use
2C1 Iron and steel production	Industrial processes and product use
2C2 Ferroalloys production	Industrial processes and product use
2C3 Aluminium production	Industrial processes and product use
2C4 Magnesium production	Industrial processes and product use
2C5 Lead production	Industrial processes and product use
2C6 Zinc production	Industrial processes and product use
2C7a Copper production	Industrial processes and product use
2C7b Nickel production	Industrial processes and product use
2C7c Other metal production	Industrial processes and product use
2C7d Storage, handling and transport of metal products	Industrial processes and product use
2D3a Domestic solvent use including fungicides	Industrial processes and product use
2D3b Road paving with asphalt	Industrial processes and product use
2D3c Asphalt roofing	Industrial processes and product use
2D3d Coating applications	Industrial processes and product use
2D3e Degreasing	Industrial processes and product use
2D3f Dry cleaning	Industrial processes and product use
2D3g Chemical products	Industrial processes and product use
2D3h Printing	Industrial processes and product use
2D3i Other solvent use	Industrial processes and product use
2G Other product use	Industrial processes and product use
2H1 Pulp and paper industry	Industrial processes and product use

Sector code an label NFR14 (continued)	Sector label EEA
2H2 Food and beverages industry	Industrial processes and product use
2H3 Other industrial processes	Industrial processes and product use
2I Wood processing	Industrial processes and product use
2J Production of POPs	Industrial processes and product use
2K Consumption of POPs and heavy metals (e.g. electrical and scientific equipment)	Industrial processes and product use
2L Other production, consumption, storage, transportation or handling of bulk products	Industrial processes and product use
3B1a Manure management - Dairy cattle	Agriculture
3B1b Manure management - Non-dairy cattle	Agriculture
3B2 Manure management - Sheep	Agriculture
3B3 Manure management - Swine	Agriculture
3B4a Manure management - Buffalo	Agriculture
3B4d Manure management - Goats	Agriculture
3B4e Manure management - Horses	Agriculture
3B4f Manure management - Mules and asses	Agriculture
3B4gi Manure mangement - Laying hens	Agriculture
3B4gii Manure mangement - Broilers	Agriculture
3B4giii Manure mangement - Turkeys	Agriculture
3B4giv Manure management - Other poultry	Agriculture
3B4h Manure management - Other animals	Agriculture
3Da1 Inorganic N-fertilizers (includes also urea application)	Agriculture
3Da2a Animal manure applied to soils	Agriculture
3Da2b Sewage sludge applied to soils	Agriculture
3Da2c Other organic fertilisers applied to soils (including compost)	Agriculture
3Da3 Urine and dung deposited by grazing animals	Agriculture
3Da4 Crop residues applied to soils	Agriculture
3Db Indirect emissions from managed soils	Agriculture
3Dc Farm-level agricultural operations including storage, handling and transport of agricultural products	Agriculture
3Dd Off-farm storage, handling and transport of bulk agricultural products	Agriculture
3De Cultivated crops	Agriculture

Sector code an label NFR14 (continued)	Sector label EEA
3Df Use of pesticides	Agriculture
3F Field burning of agricultural residues	Agriculture
3I Agriculture other	Agriculture
5A Biological treatment of waste - Solid waste disposal on land	Waste
5B1 Biological treatment of waste - Composting	Waste
5B2 Biological treatment of waste - Anaerobic digestion at biogas facilities	Waste
5C1a Municipal waste incineration	Waste
5C1bi Industrial waste incineration	Waste
5C1bii Hazardous waste incineration	Waste
5C1biii Clinical waste incineration	Waste
5C1biv Sewage sludge incineration	Waste
5C1bv Cremation	Waste
5C1bvi Other waste incineration	Waste
5C2 Open burning of waste	Waste
5D1 Domestic wastewater handling	Waste
5D2 Industrial wastewater handling	Waste
5D3 Other wastewater handling	Waste
5E Other waste	Waste
6A Other (included in national total for entire territory)	Other
National total for the entire territory (based on fuel sold)	National total for the entire territory (based on fuel sold)