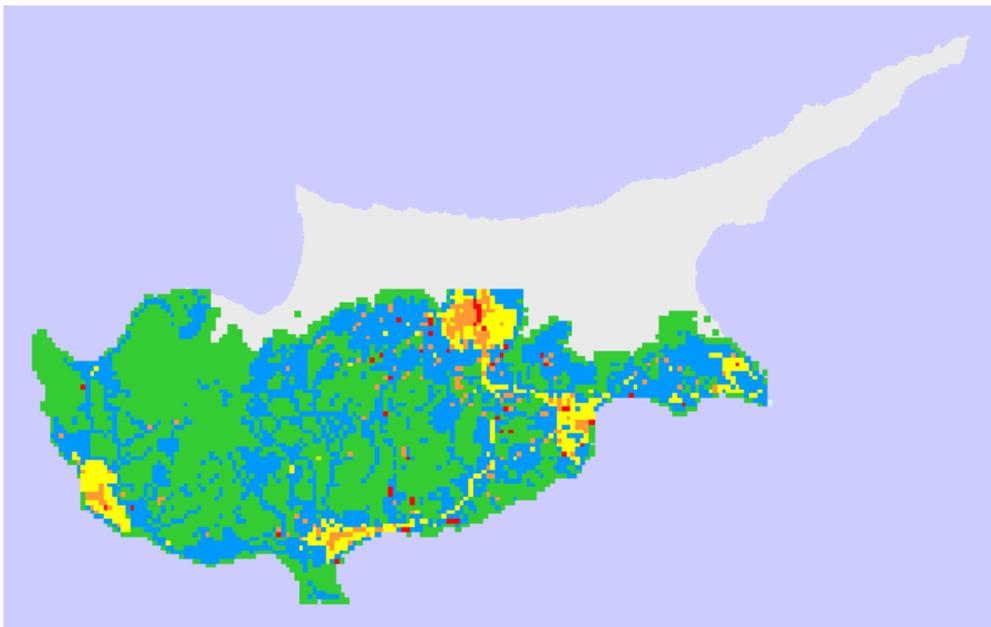




Ministry of Labour and Social Insurance
Department of Labour Inspection

**Cyprus Informative Inventory
Report 2015**



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List of Abbreviations

BC	- Black Carbon
CCGT	- Combined Cycle Gas Turbine
CDR	- Central Data Repository
CERA	- Cyprus Energy Regulatory Authority
CLRTAP	- Convention on Long-range Transboundary Air Pollution
CO	- Carbon Monoxide
COPERT	- Computer Programme to Calculate Emissions from Road Transport
DLI	- Department of Labour Inspection
EAC	- Electricity Authority of Cyprus
EEA	- European Environment Agency
EIONET	- European Environment Information and Observation Network
EMEP	- Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
E-PRTR	- European Pollutant Release and Transfer Registry
ERT	- Expert Review Team
ETC/ACC	- European Topic Centre on Air and Climate Change
GIS	- Geographical Information System
HCB	- Hexachlorobenzene
ICE	- Internal Combustion Engine
IE	- Included Elsewhere
IIR	- Informative Inventory Report
I -Teq	- International Toxic Equivalent
LRTAP	- Long-range Transboundary Air Pollution
LTO	- Land, Take Off
NA	- Not Applicable
NE	- Not Estimated
NEC	- National Emission Ceilings
NECD	- National Emission Ceilings Directive (Directive 2008/81/EC)
NEI	- National Emission Inventory
NFR	- Nomenclature for Reporting
NH ₃	- Ammonia
NMVOG	- Non Methane Volatile Organic Compounds
NO	- Not Occurring
NOx	- Nitrogen Oxides
NR	- Not Relevant
MARDE	- Ministry of Agriculture, Rural Development and Environment
MLWSI	- Ministry of Labour, Welfare and Social Insurance
PAHs	- Polycyclic Aromatic Hydrocarbons
PCBs	- Poly Chlorinated Biphenyls
PCDD/F	- PolyChlorinated DibenzoDioxin and dibenzoFuran
PM	- Particulate Matter
PM ₁₀	- Particulate matter with aerodynamic diameter less than 10 micrometers
PM _{2.5}	- Particulate matter with aerodynamic diameter less than 2.5

	micrometers
PS	- Power Station
POPs	- Persistent Organic Pollutants
RES	- Renewable Energy Sources
SO _x	- Sulphur Oxides
TFEIP	- Task Force on Emission Inventories and Projections
TSP	- Total Suspended Particulates
QA/QC	- Quality Assurance/Quality Control
UNECE	- United Nations Economic Commission for Europe
UNFCCC	- United Nations Framework Convention on Climate Change

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1. Executive Summary

This report, constituting the Cyprus Informative Inventory Report (IIR), contains information on the inventories of Cyprus up to 2015. It includes descriptions of methods and data sources. Similar reports were submitted annually to the Convention's Secretariat the period 2010 – 2015 [1-6]. In addition, these reports were uploaded in the CDR (<http://cdr.eionet.europa.eu>).

For the preparation of the 2007 National Emission Inventory, the relevant emission factors from Corinair Atmospheric Emission Inventory Guidebook [7] were used. For the years 2010 to 2012, for the preparation of the National Emission Inventories the EMEP/EEA Air Pollutant Emission Inventory Guidebook [8] was used and since 2011, the NFR09 templates were used. For the preparation of the 2014 and on National Emission Inventory the EMEP/EEA Air Pollutant Emission Inventory Guidebook 2013 was used and accordingly the new NFR014 templates. Please also note that National Emission Inventories were re-submitted for the years 1990 to 2014 based on the new emission factors of the new EMEP/EEA Air Pollutant Emission Inventory Guidebook 2013 (Corinair Guidebook) [9].

Key information on the activities required to prepare the inventory are the:

- national energy balance,
- national statistics publications,
- annual reports of industrial installations,
- national database for road vehicles and
- the E-PRTR national database.

A key category analysis level assessment is carried out for the time series 1990-2014 showing the relevant sources of air pollution in Cyprus. In addition, a key category analysis trend assessment is carried out for the year 2015 showing categories whose trend is different from the trend of the overall inventory.

Finally, the 2017 submission for the 2015 includes an uncertainty analysis in the Cyprus emission inventory.

2. Introduction

The United Nations, Economic Commission for Europe (UNECE), adopted in 1979 the Convention on Long-range Transboundary Air Pollution (LRTAP Convention). The LRTAP Convention entered into force in 1983 and has been extended by eight specific Protocols. Cyprus ratified the Convention on 20.11.1991. The Cyprus status of ratification to the Protocols is shown in **Table 1**.

Table 1: Protocols to the UNECE Convention on Long-range Transboundary Air Pollution.

Year	Protocols	Cyprus status of Ratification
1984	Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)	20.11.1991 (A)
1985	Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30% per cent	(NR)
1988	Sofia Protocol concerning the Control of Nitrogen Oxides or their Transboundary Fluxes	2.9.2004 (A)
1991	Geneva Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes	(NR)
1994	Oslo Protocol on Further Reduction of Sulphur Emissions	26.4.2006 (A)
1998	Aarhus Protocol on Heavy Metals and its 2012 amended version	24.6.1998 (S) 2.9.2004 (R) Amended Version: (NR)
1998	Aarhus Protocol on Persistent Organic Pollutants and its 2009 amended version	24.6.1998 (S) 2.9.2004 (R) 5.3.2013 (A)
1999	Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone and its 2012 amended version	11.4.2007 (A) Amended Version: (NR)

Note: R = Ratification, A = Acceptance, S = Signed, NR = Not Ratified

Reporting emissions data to the Executive Body of the LRTAP Convention is required to fulfill the obligations of the parties in compliance with the implementation of Protocols under the Convention.

This report has been prepared by the Department of Labour Inspection (DLI) of the Ministry of Labour, Welfare and Social Insurance (MLWSI) on behalf of the Republic of Cyprus, as required by the LRTAP Convention and the relevant Protocols.

2.1. *National Inventory Background*

In Cyprus a national database is used by the DLI to monitor pollutants within the framework of the National Emission Ceilings Directive (NECD) and the LRTAP Convention.

Emission estimates are based mainly on official statistics, e.g. energy, agricultural statistics and industrial statistics, environmental reports of operators of industrial installations and emission factors either from the Corinair Guidebook (mainly) or from studies conducted in Cyprus.

Cyprus applies the "Guidelines for Reporting Emission Data under the Convention on Long-range Transboundary Air Pollution" [10] for reporting to the UNECE LRTAP Convention and the "EMEP/EEA Air Pollutant Emission Inventory Guidebook 2013" [9].

The main methodology followed for the preparation of the 2015 National Emission Inventory is the top-down approach **based on fuel used** in each main sector. In some cases, sectors are reported as Included Elsewhere (IE) due to the fact that the amount of fuel used in these sectors is unknown and therefore their emissions are included in other NFR Sectors. Additionally, in certain sectors, actual emission pollutants measurements from industrial stacks are used.

In the 2015 emission inventory submissions, there are no differences found in the reported national totals for the entire territory and the corresponding NEC inventory report since it is the same report. Small differences in reported national totals were found in relation to the corresponding UNFCCC inventory report due to the fact that some categories in the UNFCCC report are not included in the LRTAP report and vice versa. The main difference in the LRTAP and UNFCCC national totals is the fact that the UNFCCC national total data exclude the international aviation emissions. Please also note that the UNFCCC report is generated by another Department (Department of Environment of the Ministry of Agriculture, Rural Development and Environment).

2.2. *Institutional Arrangements*

The Department of Labour Inspection (DLI) of the Ministry of Labour, Welfare and Social Insurance (MLWSI) of Cyprus is the Competent Authority for the control of atmospheric pollution and for the safeguarding of air quality in Cyprus.

The DLI has the overall responsibility for the emission inventory and submissions to European Commission and LRTAP Convention secretariat, through its specialized section the «Air Quality Section».

The Emission Inventory is produced on an annual basis and various Government Departments contribute to that by submitting activity data. DLI collects data from:

- The Statistical Service
- The Department of Agriculture
- The Civil Aviation Department
- The Water Development Department
- The Department of Road Transport and
- The Energy Service.

2.3. Inventory Preparation Process

For the collection of data a checklist is used by the inventory officers to contact, either by telephone or in writing, with the relevant officers from other authorities to collect the activity data. The emission data collected are stored in a database managed by the DLI.

In addition, the emission officers review methods and emission factors and suggest changes. After each review process, it is decided whether the suggestions are to be applied.

Every year, after the collection of activity data, a draft inventory is prepared, reviewed and finalized.

In 2010, a project titled “Development of an emission inventory including formation of a database for atmospheric pollutant emissions and software for simulation and forecast of air quality in Cyprus” was implemented, by the DLI. Within this project, a new software tool is established for the inventory preparation.

The general objectives of the project were the:

- Collection of activity data from all emission-generating sources.
- Development of an emission database based on methodology of the EMEP/EEA Emission Inventory Guidebook.
- Development of a GIS application for the presentation of activity data and emissions on digital maps.
- Development of a web-based application for the evaluation and management of air quality.

In **Figure 1**, the software flowchart of the project is presented. In **Figure 2-8**, digital maps present the 1km*1km total annual emission distributions (year 2014) of different pollutants.

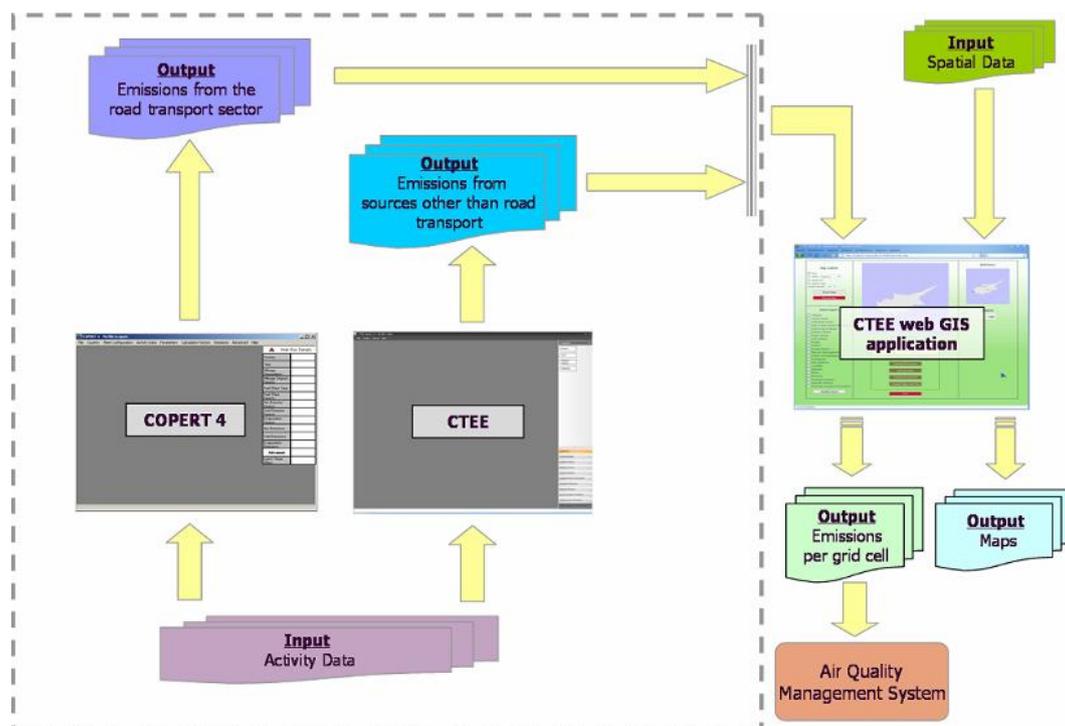


Figure 1: Project Software Flowchart

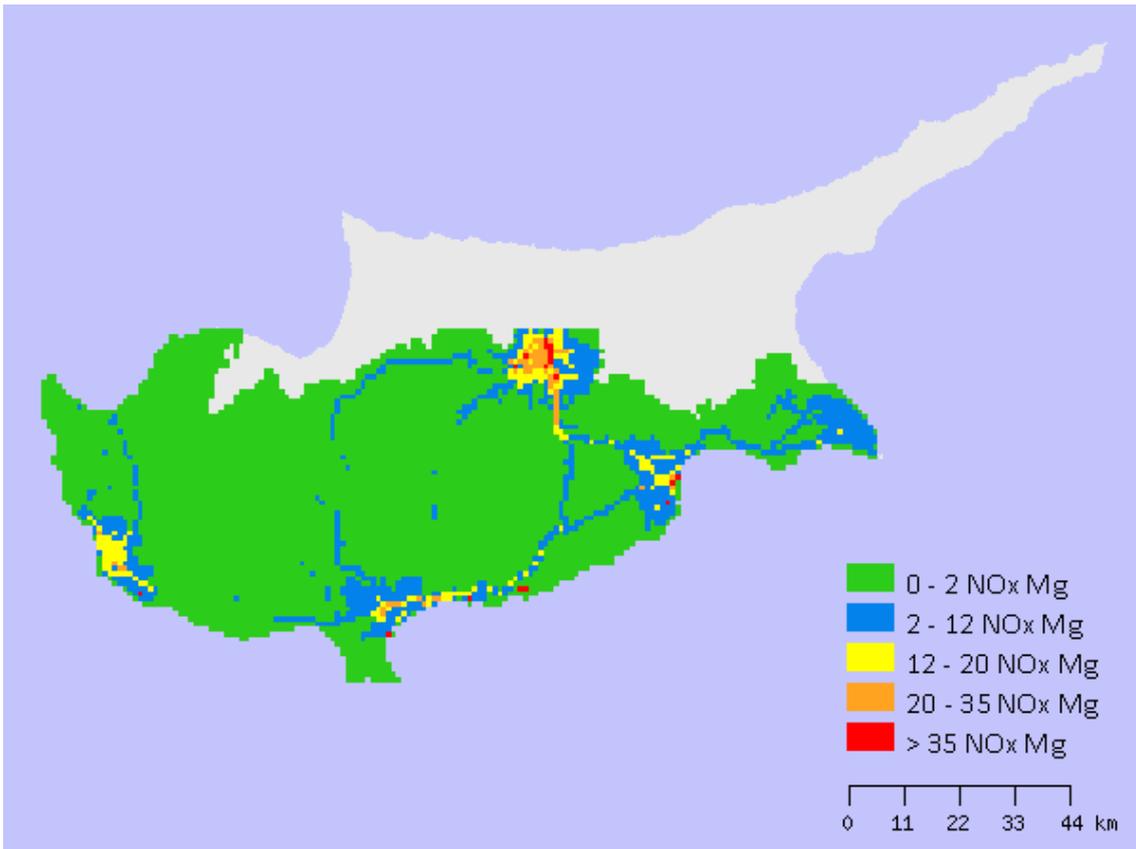


Figure 2: Geographical Distribution of 2015 NOx emissions.

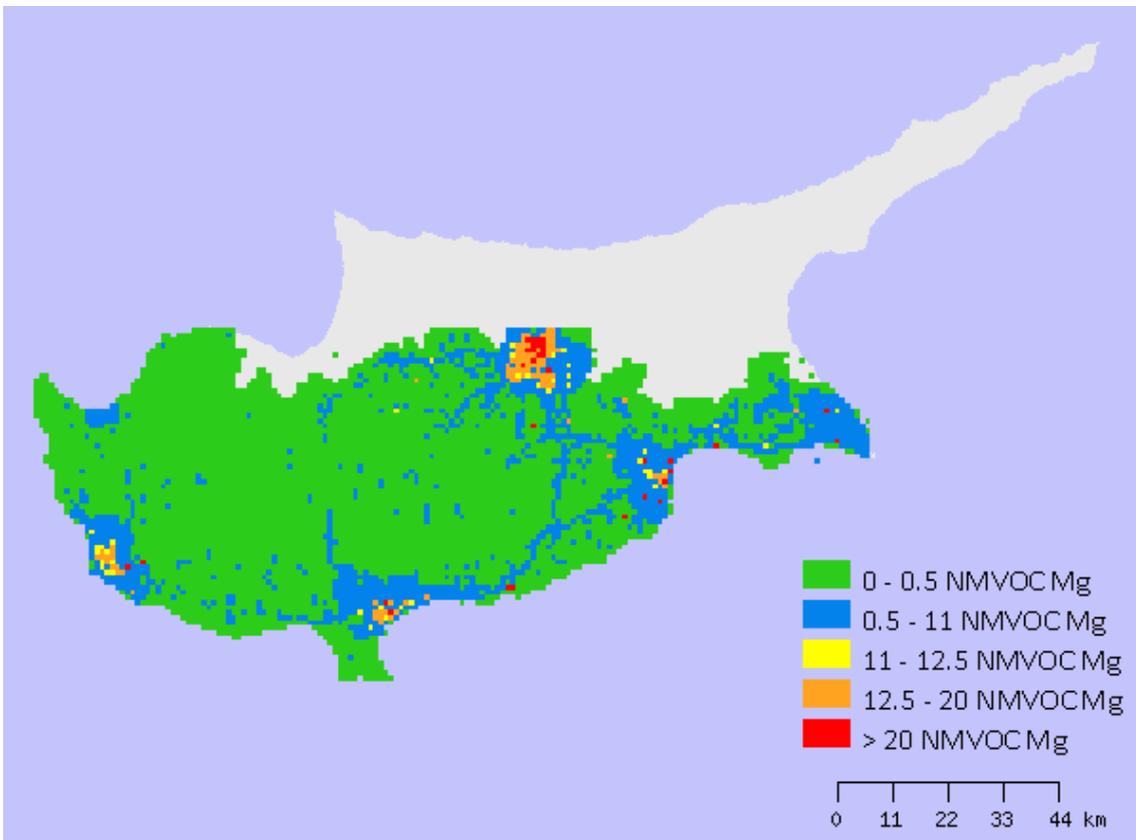


Figure 3: Geographical Distribution of 2015 NMVOC emissions.

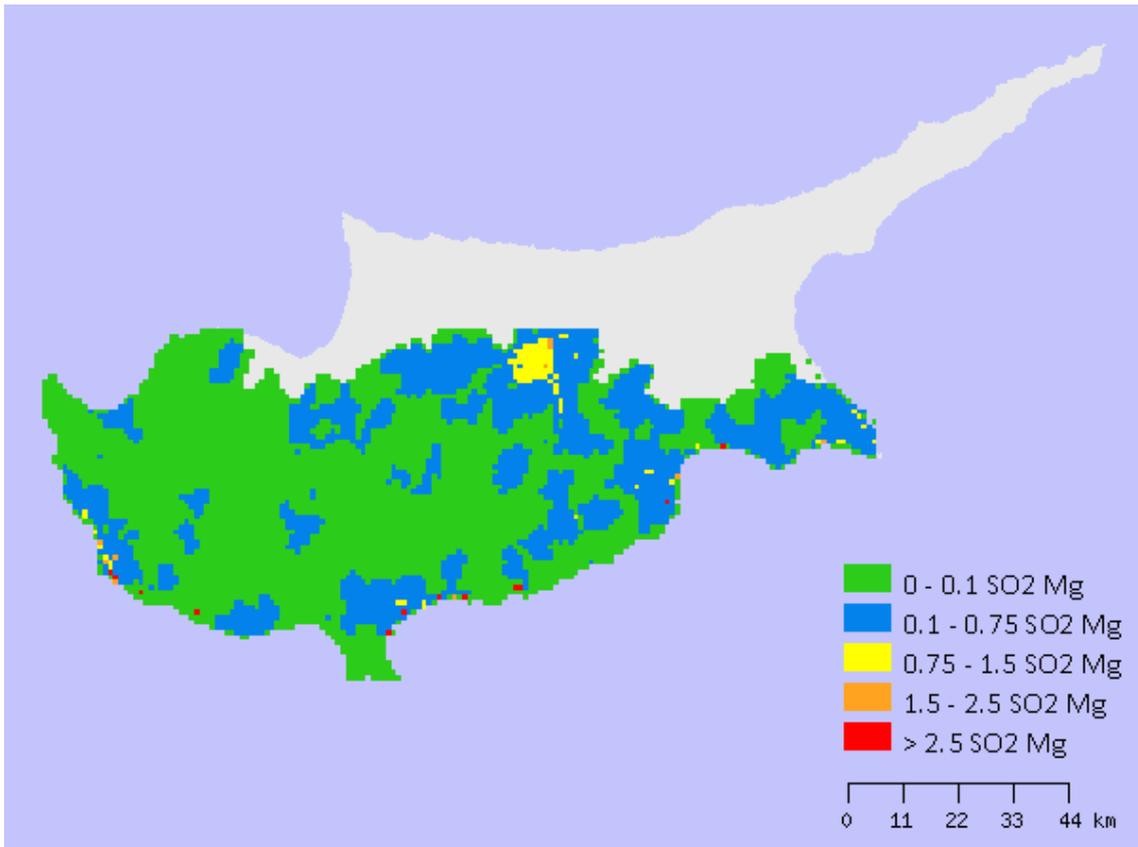


Figure 4: Geographical Distribution of 2015 SO_x emissions.

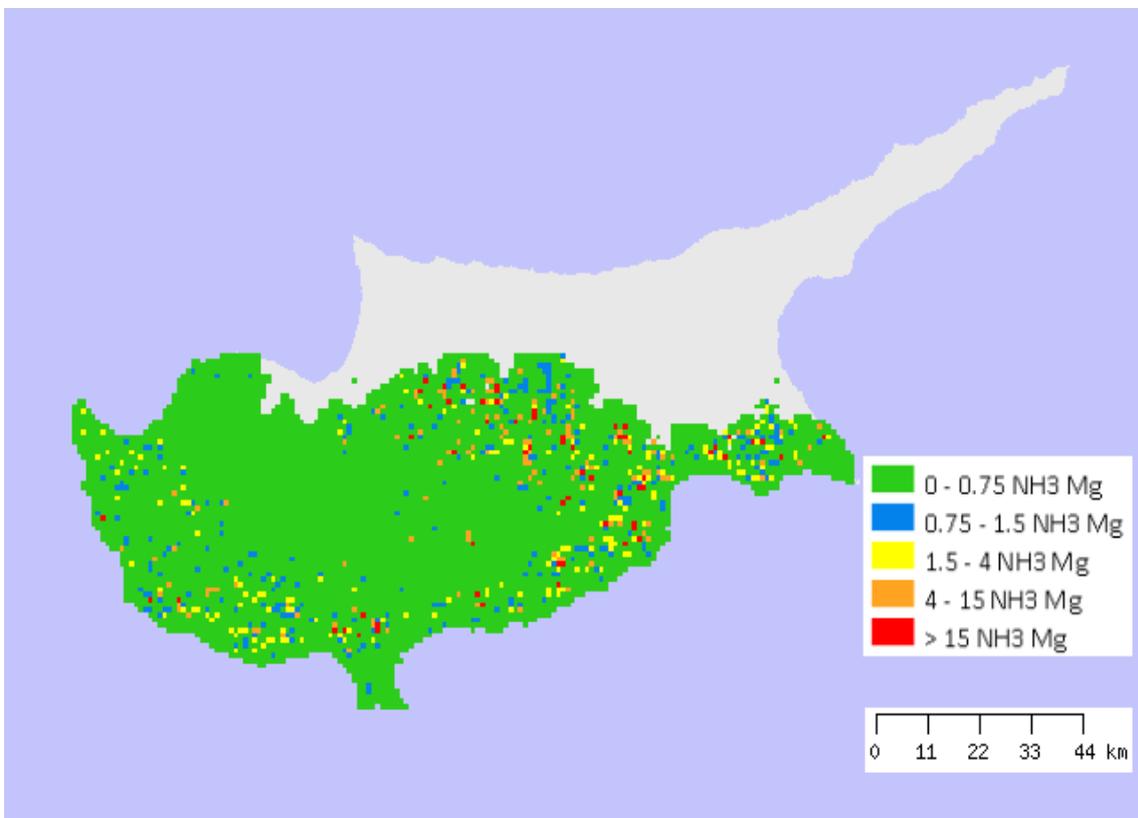


Figure 5: Geographical Distribution of 2015 NH₃ emissions.

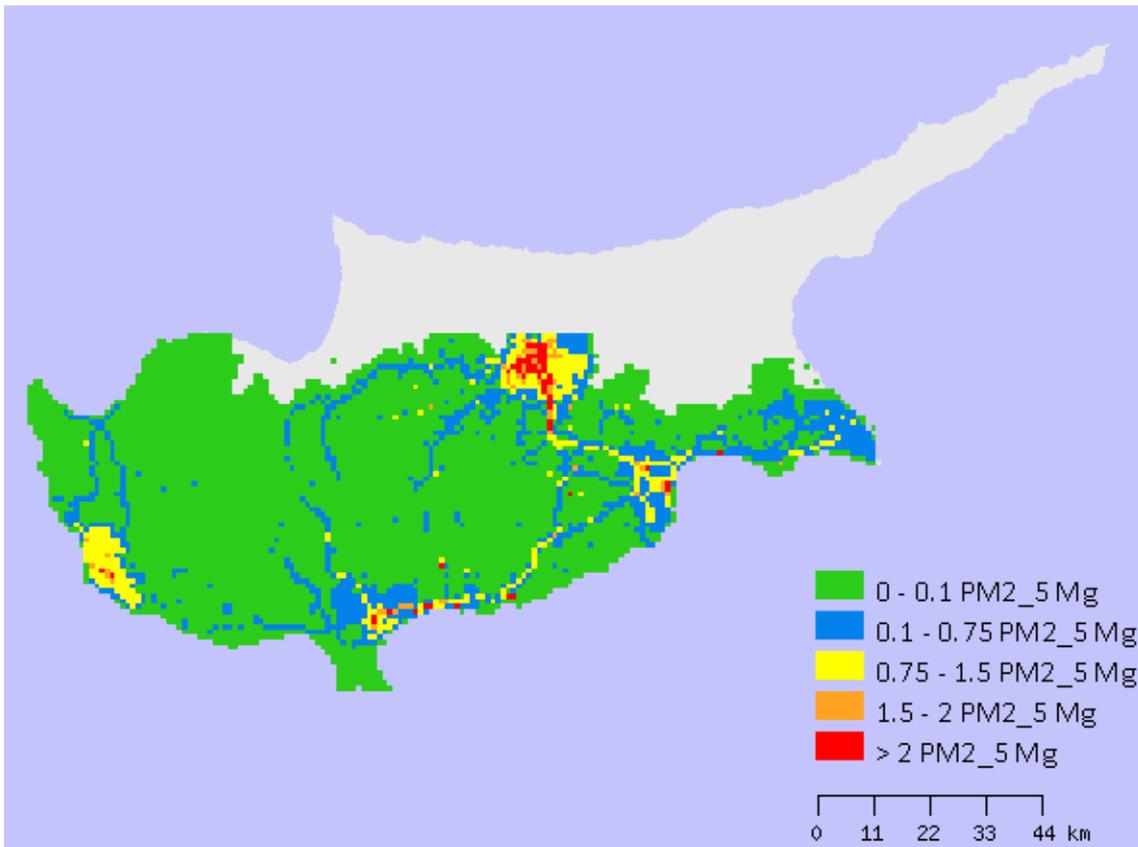


Figure 6: Geographical Distribution of 2015 PM_{2.5} emissions.

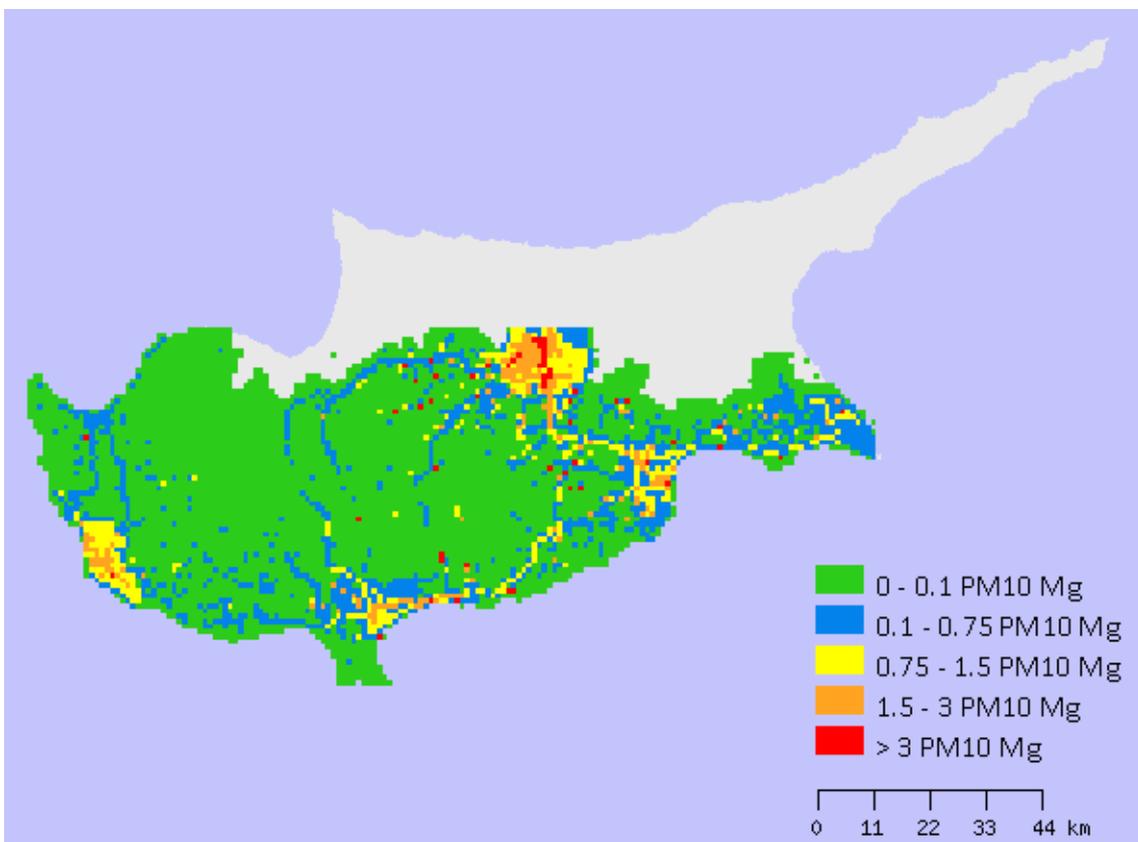


Figure 7: Geographical Distribution of 2015 PM₁₀ emissions.

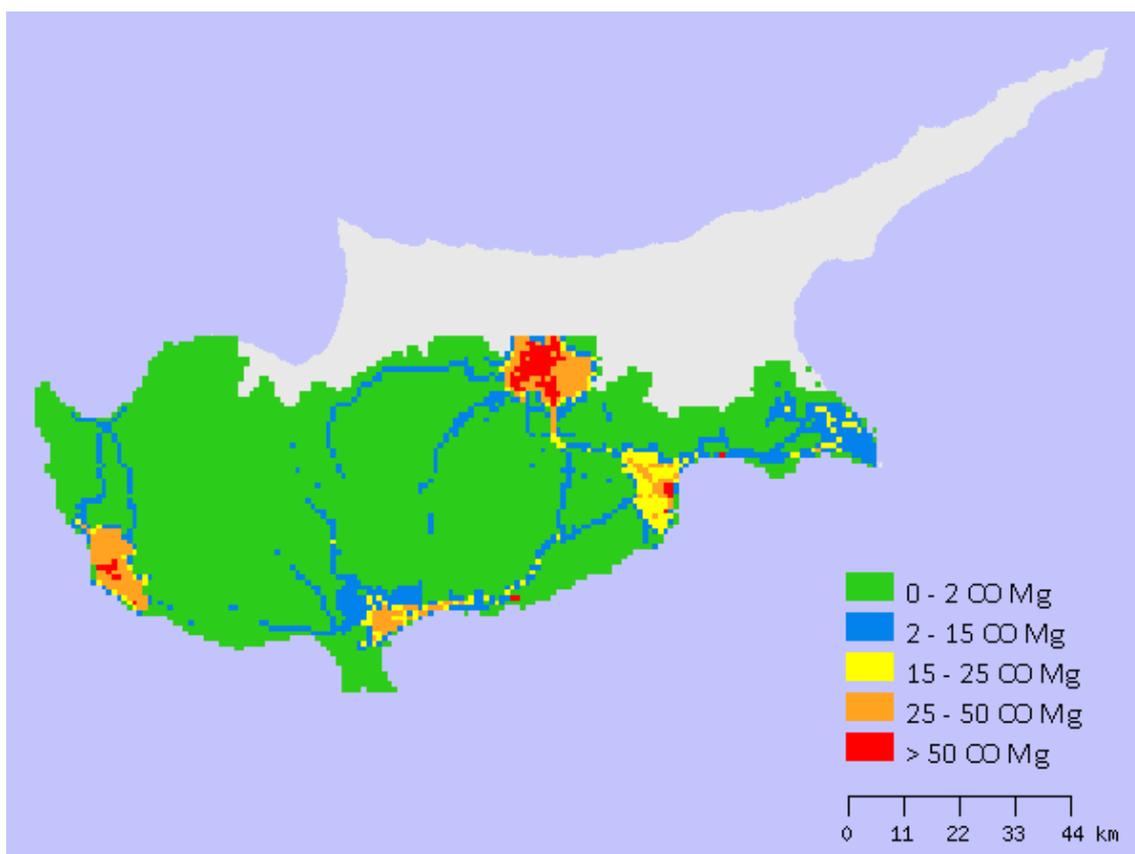


Figure 8: Geographical Distribution of 2015 CO emissions.

2.4. Methods and Data Sources

The methodology described in the EMEP/EEA Emission Inventory Guidebook 2013 [9] was used for the estimation of the emissions. The bulk of the emission inventory is compiled by collecting activity data and appropriate emission factors according to the following equation:

$$Emission_{pollutant} = \sum Activity Rate_{activity} * Emission factor_{activity,pollutant}$$

The activity data used are mainly statistical data provided by the Statistical Service (Ministry of Finance) as well as by other Ministries and governmental authorities. Data are also provided directly by industrial installations through their reporting obligations specified in their air emission permits.

As a general comment, we would like to inform you that for the preparation of the Cyprus emission inventory the Tier 2 methodology was used for key source sectors and the Tier 1 for non-key source sectors. Apart from these, for the estimation of emissions from the transport sector the COPERT 5 tool was used (Tier 3). Please also note that for the A_PublicPower sector for the pollutants NO_x, CO and particulates Tier 3 method was used.

Summary of Notation Keys

Emission Inventory (Annex IV – Table 1) includes 26 pollutants and 127 NFR categories resulting to 3302 cells. In Cyprus's National Emission Inventory (NEI) for the year 2015, only 608 cells have values. All others are filled in with notation keys as follows:

Notation key	No of cells
IE	130
NO	1456
NA	637
NE	471
Values	608
Total	3302

2.5. Key Categories

For the identification of the key categories, Approach 1, described in the «Key Category Analysis and Methodological Choice» of the EMEP/EEA Air Pollutant Emission Inventory Guidebook 2103 [9], was used. With this approach the influence of various categories of sources on the level of the national inventory was identified.

Level Assessment

The contribution of each source category to the total national inventory level is calculated according to the following equation:

$$\text{Key category level assessment} = \frac{\text{Source category estimate}}{\text{Total contribution}}$$

Key categories, according to the above equation, are those that when summed together in descending order of magnitude, add up to 80 percent of the national total.

The results of the Approach 1 Level Assessment per pollutant for the year 2015 are shown in the following **Table 2-17** (Sorted from high to low and highlighted using the following color codes).

Color Codes:

A_PublicPower	Yellow
B_Industry	Light Green
C_OtherStationaryComb	Yellow
D_Fugitive	Pink
E_Solvents	Light Blue
F_RoadTransport	Red
H_Aviation	Blue

G_Shipping	Grey
I_Offroad	Orange
J_Waste	Orange
K_AgriLivestock	Light Green
L_AgriOther	Green
M_Other	Dark Blue

Table 2: Key Categories for NOx.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	4844,57	32,02%	32,02%
1A3biii	Road transport: Heavy duty vehicles and buses	2942,86	19,45%	51,46%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	2138,04	14,13%	65,59%
1A3bi	Road transport: Passenger cars	1282,70	8,48%	74,07%
1A3bii	Road transport: Light duty vehicles	1272,58	8,41%	82,48%

Table 3: Key Categories for NMVOC.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
2D3d	Coating applications	1617,35	21,72%	21,72%
1A3bv	Road transport: Gasoline evaporation	1186,70	15,94%	37,66%
1B2av	Distribution of oil products	782,18	10,50%	48,16%
1A3bi	Road transport: Passenger cars	690,50	9,27%	57,43%
5A	Biological treatment of waste - Solid waste disposal on land	628,68	8,44%	65,88%
1A3biv	Road transport: Mopeds & motorcycles	402,65	5,41%	71,28%
2D3h	Printing	247,20	3,32%	74,60%
3B4gii	Manure management - Broilers	216,09	2,90%	77,50%
3B1a	Manure management - Dairy cattle	207,67	2,79%	80,29%

Table 4: Key Categories for SO_x.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	11357,90	86,35%	86,35%

Table 5: Key Categories for NH₃.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3B3	Manure management - Swine	1378,77	30,32%	30,32%
3B1a	Manure management - Dairy cattle	1074,13	23,62%	53,94%
3B1b	Manure management - Non-dairy cattle	387,28	8,52%	62,45%
3Da1	Inorganic N-fertilizers (includes also urea application)	336,64	7,40%	69,86%
3B4gi	Manure management - Laying hens	288,18	6,34%	76,19%
3B4gii	Manure management - Broilers	277,27	6,10%	82,29%

Table 6: Key Categories for PM_{2.5}.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	196,41	19,58%	19,58%
1A3ei	Pipeline transport	114,58	11,42%	31,01%
1A3bv	Road transport: Gasoline evaporation	110,46	11,01%	42,02%
1A4bii	Residential: Household and gardening (mobile)	81,55	8,13%	50,15%
1A3eii	Other (please specify in the IIR)	78,03	7,78%	57,93%
1B2aiv	Fugitive emissions oil: Refining / storage	69,59	6,94%	64,87%
1A3dii	National navigation (shipping)	56,39	5,62%	70,49%
2B3	Adipic acid production	55,33	5,52%	76,01%
3Da2b	Sewage sludge applied to soils	37,26	3,72%	79,72%
1A3aii(i)	Domestic aviation LTO (civil)	21,54	2,15%	81,87%

Table 7: Key Categories for PM₁₀.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	294,61	17,11%	17,11%
1A3bvi	Road transport: Automobile tyre and brake wear	152,63	8,86%	25,97%
2A5a	Quarrying and mining of minerals other than coal	122,18	7,10%	33,07%
1A3bii	Road transport: Light duty vehicles	114,58	6,65%	39,72%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	110,46	6,41%	46,14%
3B4gii	Manure management - Broilers	89,87	5,22%	51,36%
5A	Biological treatment of waste - Solid waste disposal on land	88,26	5,13%	56,48%
2A1	Cement production	88,12	5,12%	61,60%
1A3biii	Road transport: Heavy duty vehicles and buses	78,03	4,53%	66,13%
2A5b	Construction and demolition	71,55	4,15%	70,28%
1A4bi	Residential: Stationary	71,31	4,14%	74,43%
3B3	Manure management - Swine	63,30	3,68%	78,10%
1A3bi	Road transport: Passenger cars	56,39	3,28%	81,38%

Table 8: Key Categories for TSP.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	392,81	16,45%	16,45%
2A5a	Quarrying and mining of minerals other than coal	235,40	9,86%	26,31%
1A3bvi	Road transport: Automobile tyre and brake wear	200,28	8,39%	34,70%
5A	Biological treatment of waste - Solid waste disposal on land	186,59	7,81%	42,51%
2A5b	Construction and demolition	142,74	5,98%	48,49%
3B3	Manure management - Swine	141,74	5,94%	54,43%
2D3c	Asphalt roofing	120,69	5,05%	59,48%
1A3bii	Road transport: Light duty vehicles	114,58	4,80%	64,28%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	110,46	4,63%	68,91%
3B4gii	Manure management - Broilers	89,87	3,76%	72,67%
2A1	Cement production	88,94	3,72%	76,40%
1A3biii	Road transport: Heavy duty vehicles and buses	78,03	3,27%	79,67%
1A4bi	Residential: Stationary	74,75	3,13%	82,80%

Table 9: Key Categories for BC.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A3bii	Road transport: Light duty vehicles	76,23	28,04%	28,04%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	61,85	22,76%	50,80%
1A3biii	Road transport: Heavy duty vehicles and buses	47,30	17,40%	68,20%
1A3bi	Road transport: Passenger cars	35,84	13,19%	81,39%

Table 10: Key Categories for CO.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A3bi	Road transport: Passenger cars	6740,02	46,83%	46,83%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	2420,68	16,82%	63,66%
1A3biv	Road transport: Mopeds & motorcycles	1391,44	9,67%	73,32%
1A3bii	Road transport: Light duty vehicles	1171,69	8,14%	81,47%

Table 11: Key Categories for Pb.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A3bi	Road transport: Passenger cars	13,69	56,58%	56,58%
1A3biii	Road transport: Heavy duty vehicles and buses	5,10	21,07%	77,65%
1A3bii	Road transport: Light duty vehicles	4,75	19,61%	97,26%

Table 12: Key Categories for Cd.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	0,024	48,78%	48,78%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0,013	26,27%	75,04%
1A3bi	Road transport: Passenger cars	0,004	8,01%	83,05%

Table 13: Key Categories for Hg.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0,0804	90,84%	90,84%

Table 14: Key Categories for PCDD/F.

NFR Code	Longname	Emissions (g I-TEQ)	Level Assessment	Cumulative Total
1A3bi	Road transport: Passenger cars	0,1082	27,38%	27,38%
1A1a	Public electricity and heat production	0,0873	22,09%	49,46%
1A4bi	Residential: Stationary	0,0873	22,08%	71,54%
1A3bii	Road transport: Light duty vehicles	0,0599	15,15%	86,69%

Table 15: Key Categories for PAHs.

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3F	Field burning of agricultural residues	0,0008	64,94%	64,94%
1A1a	Public electricity and heat production	0,0003	26,53%	91,46%

Table 16: Key Categories for HCB.

NFR Code	Longname	Emissions (Kg)	Level Assessment	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0,00755	89,42%	89,42%

Table 17: Key Categories for PCBs.

NFR Code	Longname	Emissions (Kg)	Level Assessment	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0,0338	79,60%	79,60%
1A4bi	Residential: Stationary	0,0052	12,15%	91,76%

Trend Assessment

The purpose of the trend assessment is to identify categories that may not be large enough to be identified by the level assessment, but whose trend is significantly different from the trend of the overall inventory and should therefore receive particular attention.

The trend assessment for the year 2015 was calculated according to the following equation:

$$T_{x,2015} = \frac{E_{x,2015}}{\sum E_{2015}} \left(\frac{E_{x,2015} - E_{x,1990}}{E_{x,1990}} - \frac{\sum E_{2015} - \sum E_{1990}}{\sum E_{1990}} \right)$$

Whereas: $T_{x,2015}$ = Trend assessment of source category x in 2015 as compared to the base year (1990).
 $E_{x,2015}$ and $E_{x,1990}$ = Values of estimates of source category x in year 2015 and 1990, respectively.
 $\sum E_{2015}$ and $\sum E_{1990}$ = Total inventory estimates in years 2015 and 1990, respectively.

Please note that for PM_{2.5}, PM₁₀, TSP and BC the base year is the year 2000.

The trend assessment identifies categories whose trend is different from the trend of the total inventory, regardless whether the category trend is increasing or decreasing, or is a sink or source. Categories whose trend diverges most from the total trend should be identified as key, when this difference is weighted by the level of emissions of the category in the base year.

The results of the approach 1 trend assessment per pollutant for the year 2014 are shown in Annex 3.

Concluding, the results of the establishment of key source analysis in Cyprus national emission inventory are presented in Annexes 1-3 as described below:

Annex 1: Key Category Analysis – Level Assessment 2015, concerning key category analysis (level assessment) per pollutant for the year 2015.

Annex 2: Key Category Analysis – Level Assessment 1990-2014, concerning key source categories (level assessment) for the whole time series 1990 -2014, per pollutant and per year.

Annex 3: Key Category Analysis – Trend Assessment 2015, concerning key source categories (trend assessment) per pollutant for the year 2015.

2.6. Emissions of Large Point Sources (LPS)

Table 18 gives an overview of emission totals of Sulphur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM₁₀) from four (4) large point sources

operating in Cyprus and which have reported their emissions in the E-PRTR. These 4 installations are 3 power stations and 1 cement plant. Please note that last year the Moni Power Station has almost stopped its operations. It works a few hours per year (on average 170) and it is considered a standby unit.

It can be seen that these three LPSs in 2015, contributed:

- 91.03% of the national total SO₂ emissions,
- 45.02% of the national total NO_x emissions,
- 20.03% of the national total CO emissions and
- 22.79% of the national total PM₁₀ emissions.

Table 18: Pollutant emissions from Large Point Sources in 2015.

Large Point Source		SO ₂		NO _x		CO		PM ₁₀	
		Gg	%	Gg	%	Gg	%	Gg	%
1	Vassilikos Power Station	5.48	41.67	1.72	11.25	0.22	1.56	0.17	9.88
2	Dhekelia Power Station	5.87	44.64	3.04	19.90	0.21	1.49	0.12	6.98
3	Moni Power Station	0.01	0.08	0.08	0.52	0.001	0.01	0.002	0.11
4	Vassilikos Cement Plant	0.61	4.64	2.04	13.35	2.39	16.97	0.10	5.81
Total LPS		11.97	91.03	6.88	45.02	2.82	20.03	0.39	22.79
National Total		13.15		15.28		14.08		1.72	

2.7. QA/QC and Verification Methods

The DLI is responsible for the Quality Assurance/Quality Control procedures which include the following steps:

- Preparation of a check list for checking the completeness of input data (data from large point sources, data from statistical service, activity data, emission factors etc.).
- Evaluation of the emission factors of previous year emissions estimations to determine if there is any reason to change them.
- Comparison of the value of input data with the previous years' value. If there are large deviations, the value is checked for any errors such as typing or unit errors. If necessary, the primary data providers are contacted for clarifications.

Data provided by the Statistical Service of Cyprus are characterized by independence, integrity and accountability. Hence, these data are not subjected to any checking.

A number of general quality control checks have been introduced as part of the annual work plan. The quality control checks aim at covering such issues as consistency, completeness and accuracy of the NFR data.

For the A_Public Power and B_Industry sectors, emission calculations are based mainly on annual environmental reports submitted by operators of industrial installations. The operators themselves are responsible for the data quality. The emission inventory experts are responsible for checking and approving the reported data, as part of the quality assurance procedure.

After the initial estimation of the emissions and the completion of the Informative Inventory Report carried out by the officers in charge, the Head of the Air Quality Section of the DLI conducts a review of the inventory estimates, methodology and emission factors used. The national emission inventory is finally approved by the Director of the DLI.

Furthermore, within the framework of the LRTAP Convention, the year 2008 began with a review and check in detail of each Party (so-called Stage 3 in depth reviews) in accordance with the model established under the UN Framework Convention on Climate Change (UNFCCC). Based on the long term plan scheduled, which was approved by the EMEP Steering Body in September 2009, Cyprus' inventory was reviewed for the first time in 2010. The second in depth review (stage 3) of Cyprus Inventory took place between 23-27 of June 2014 in Copenhagen by 2 expert review teams (ERTs). Some of the suggestions of the ERTs have already been implemented and the rest of them will be implemented in the near future [12].

2.8. General Uncertainty Evaluation

The uncertainties of the Cyprus emission inventory were evaluated for the first time in 2009. The uncertainty estimations are developed to be in accordance with the Tier 1 methodology described in the EMEP/EEA Guidebook 2013 [9].

Undertaking a quantitative estimate of emissions uncertainty requires a substantial amount of detailed data on the uncertainty of both activity data and emission factors. An uncertainty analysis has been used to determine the overall emissions uncertainty for a number of pollutants for 2015 data using as a base year the 1990 and the year 2000 for PM_{2.5}, PM₁₀, TSP and BC. The uncertainty assigned to the activity data and emission factor for each individual source is obtained from a combination of expert judgment and ranges of uncertainty obtained from the EMEP/EEA Emission Guidebook 2013 [9]. The results provide good indication which sources are contributing the most to the overall uncertainty, and therefore where improvement effort should be targeted.

The results of the Tier 1 uncertainty analysis are presented in detail in Annex 4, **Table 131-142**. The results are summarized in **Table 19**.

Table 19: Emissions Uncertainties.

Pollutant	Emissions (2015)	Uncertainty (%)	Trend Uncertainty (1990-2015) (%)
NO _x	15.280 Gg	35,78	19,36
NMVOG	7.386 Gg	43,58	15,18
SO _x	13.154 Gg	16,62	7,91
NH ₃	4.541 Gg	144,39	61,33
PM _{2.5}	1.006 Gg	63,62	14,24
PM ₁₀	1.727 Gg	87,80	15,74
TSP	2.395 Gg	93,86	13,58
BC	0,273 Gg	31,92	7,34
CO	14.078 Gg	39,56	9,12
Pb	25.196 Mg	29,54	4,82
Cd	0.050 Mg	26,13	48,61
Hg	0.089 Mg	4,46	11,90
PCDD/PCDF	0.400 g I- Teq	64,59	10,30
PAHs	1.221 Mg	155,27	10,70
HCB	0.068 kg	13,98	1,94
PCBs	0.042 kg	29,19	7,77

2.9. General Assessment of Completeness

The emission inventory covers all relevant sources as specified in the LRTAP Convention that determine the emissions to the atmosphere in Cyprus. It is not always possible to specify all sub sectors in detail. Based on that, in the emission tables (NFR), notation keys are used.

In **Table 20** the explanation on the use of Notation keys in the Emission Inventory is given. Definitions given in the table below (2nd Column) are derived from the “Guidelines for Reporting Emission Data under the Convention LRTAP” ECE/EB.AIR/97 dated 27 January 2009 [10].

Table 20: Definition of Notation Keys.

Notation Key	UNECE/EMEP explanation	Use of notation key in national inventory
Not estimated (NE)	Emissions occur, but have not been estimated or reported.	Used
Included elsewhere (IE)	Emissions for this source are estimated and included in the inventory but not presented separately for this source. The source where these emissions are included should be indicated.	Used
Confidential information (C)	Emissions are aggregated and included elsewhere in the inventory because reporting at a disaggregated level could lead to the disclosure of confidential information.	Not Used
Not applicable (NA)	The source exists but relevant emissions are considered never to occur.	Used
Not occurring (NO)	A source or process does not exist within a country.	Used
Not relevant (NR)	According to paragraph 9 in the Emission Reporting Guidelines, emission inventory reporting should cover all years from 1980 onwards if data are available. However, «NR» (not relevant) is introduced to ease the reporting where emissions are not strictly required by the different protocols, e.g. for some Parties emissions of NMVOCs prior to 1988.	NR used for particulate emissions and BC for the period 1990-1999.

Sources Not Estimated (NE)

In **Table Table 21** sources reported as NE (Not Estimated) are presented.

Table 21: Sources reported with the Notation Key NE (Not Estimated)

NFR Code	Substance (s)
3Da2a	All
3Da2b	All
3Da2c	All
3Da3	All
3Da4	All
3Db	All
1A1a	NH ₃
1A2a	NH ₃ , HCB and PCBs
1A2b	NH ₃ , HCB and PCBs
1A2d	NH ₃ , HCB and PCBs
1A2gvii	Pb, Hg, As, PCDD/ PCDF

NFR Code	Substance (s)
1A3ai(i)	All except NO _x , NMVOC, SO _x , PM ₁₀ , PM _{2.5} , TSP, CO, HCB and PCBs
1A3aii(i)	All except NO _x , NMVOC, SO _x , PM ₁₀ , PM _{2.5} , TSP, CO, HCB and PCBs
1A3bi	Hg and As
1A3bii	Hg and As
1A3biii	Hg and As
1A3biv	Hg and As
1A3bv	Zn, PCDD/PCDF, PAHs and PCBs
1A3bvi	CO, PCBs, PAHs and PCDD/PCDF
1A3bvii	All except NO _x , NMVOC, SO _x , NH ₃ , BC, Zn and HCB
1A3dii	All except NO _x , NMVOC, SO _x , PM _{2.5} , PM ₁₀ , TSP and BC.
1A4ci	NH ₃ , HCB and PCBs
1A4cii	Pb, Hg, As and PCDD/PCDF
1A4ciii	All except NO _x , NMVOC, SO _x , PM _{2.5} , PM ₁₀ , TSP and BC.
1A5b	All except NO _x , NMVOC, SO _x , PM _{2.5} , PM ₁₀ , TSP and BC.
1B2av	SO _x and PCDD/PCDF
2A1	All except PM _{2.5} , PM ₁₀ , TSP and BC.
2A2	NO _x , NMVOC, SO _x , CO, Pb, Cd and Hg
2A5b	NMVOC
2D3a	PM _{2.5} , PM ₁₀ and TSP
2D3b	NO _x , SO _x , CO, PCDD/PCDF, PAHs and HCB
2D3c	NO _x , Pb, Cd, Hg, PCDD/PCDF, PAHs and HCB
2D3f	PM _{2.5} , PM ₁₀ and TSP
2D3g	All except NMVOC and BC
2D3h	PM _{2.5} , PM ₁₀ and TSP
2G	Se, HCB and PCBs
2H2	PM _{2.5} , PM ₁₀ and TSP
3F	HCB and PCBs
5A	NH ₃ , CO and Hg
5B1	NO _x , NMVOC, SO _x , PM ₁₀ , PM _{2.5} , TSP, BC and CO
5C1bv	All except PM _{2.5} , PM ₁₀ , TSP and BC
5C2	NH ₃ , Hg, Ni and HCB
5D1	All except NO _x , NMVOC, SO _x , BC, CO, PCDD/PCDF, PAHs, HCB and PCBs
5E	All except PM _{2.5} , PM ₁₀ , TSP, BC and PCDD/PCDF

Sources Included Elsewhere (IE)

In **Table 22** sources reported as IE (Included Elsewhere) are presented.

Table 22: Sources reported with the Notation Key IE (Included Elsewhere).

NFR Code	Substance (s)	Included in NFR Code
1A4ai	All	1A4bi
1A4aii	All	1A3bi-vii
1A4bii	All	1A4cii
1A5a	All	1A4bi, 1A4ci
5D2	All	5D1

Sources Not Applicable (NA)

In the reporting template “Annex IV-Table 1” there are several cells pre-filled with the Notation Key NA. Apart from those, NA was used in some other pollutant sources that in the Guidebook are mentioned as NA. In the following **Table 23** these sources are presented.

Table 23: Additional NFR Sources Reported as NA.

NFR Code	Substance (s)
1A2gvii	HCB and PCBs
1A3ai(i)	BC, HCB and PCBs
1A3aii(i)	BC, HCB and PCBs
1A3bv	All except NMVOCs, Zn, PCDD/PCDF, PAHs and PCBs
1A3bvi	NO _x , NMVOC, NH ₃ , SO _x , BC and HCB
1A3bvii	NO _x , NMVOC, NH ₃ , SO _x , BC, Zn and HCB
1A3dii	BC
1A4cii	BC, HCB and PCBs
1A4ciii	BC
1A5b	BC
1B2av	All except NMVOCs, NH ₃ and PCDD/PCDF
2A2	All except NO _x , NMVOC, SO _x , PM ₁₀ , PM _{2.5} , TSP, BC, CO, Pb, Cd and Hg
2A5a	All except PM ₁₀ , PM _{2.5} and TSP
2A5b	All except NMVOCs, PM ₁₀ , PM _{2.5} and TSP
2A5c	All except PM ₁₀ , PM _{2.5} and TSP
2D3a	All except NMVOCs, PM ₁₀ , PM _{2.5} and TSP
2D3b	All except NO _x , NMVOC, SO _x , PM ₁₀ , PM _{2.5} , TSP, BC, CO, PCDD/PCDF, PAHs and HCB
2D3c	All except NO _x , NMVOC, PM ₁₀ , PM _{2.5} , TSP, BC, CO, Pb, Cd, Hg, PCDD/PCDF, PAHs and HCB
2D3d	All except NMVOCs
2D3f	All except NMVOCs, PM ₁₀ , PM _{2.5} and TSP
2D3g	BC
2D3h	All except NMVOCs, PM ₁₀ , PM _{2.5} and TSP
2H2	All except NMVOCs, PM ₁₀ , PM _{2.5} and TSP
2K	All
3B	All except NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} and TSP

NFR Code	Substance (s)
3Da1	All except NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} and TSP
3Dc	All
3Dd	All
5A	All except NMVOCs, NH ₃ , PM ₁₀ , PM _{2.5} and TSP, Hg and CO
5B1	All Heavy Metals, PCDD/PCDF, PCBs, HCB and PAHs.
5C1bv	BC
5C2	PCBs
5D1	NO _x , SO _x , BC, CO, PCDD/PCDF, PCBs, HCB and PAHs
5E	BC

Not Occuring

In **Table 24** sources reported as NO (Not Occuring) are presented.

Please note that for the categories shown in Table 24, all the substances have the Notation Key NO (Not Occuring).

Table 24: Sources reported with the notation key NO (Not Occuring)

NFR Code					
1A1b	1B2aiv	2B6	2C7a	2L	5C1bii
1A1c	1B2b	2B7	2C7b	3B4a	5C1biii
1A3c	1B2c	2B10a	2C7c	3B4giv	5C1biv
1A3di(ii)	1B2d	2B10b	2C7d	3B4h	5C1bvi
1A3ei	2A3	2C1	2D3e	3De	5D3
1A3eii	2A6	2C2	2D3i	3Df	6A
1B1a	2B1	2C3	2H1	3I	
1B1b	2B2	2C4	2H3	5B2	
1B1c	2B3	2C5	2I	5C1a	
1B2ai	2B5	2C6	2J	5C1bi	

Not Relevant

Notation key NR is used for particulate matter emissions for the period 1990 – 1999.

Other Notation Keys

No other notation keys were used in the emission inventory.

3. Explanation of Key Trends

The emissions of all pollutants showed variable trends in the period 1990 – 2015 (**Table 25** and **Figure 9-11**). Generally, an upward trend is observed for the period 1990 – 2000 and a downward trend for the period 2000 – 2015. In addition, a downward trend is observed for the period of 1990 – 2015 for all pollutants except heavy metals.

The major overall drivers for the downward trend observed for the period after 2000 are cleaner fuels, cleaner cars, emission reductions in the industrial sector and application of the provisions of the relevant EU Directives.

Table 25: Total National Emissions 1990 - 2015.

Year	Main Pollutants					Particulate Matter				Priority Heavy Metals		
	NO _x	VOC	SO _x	NH ₃	CO	TSP	PM ₁₀	PM _{2.5}	BC	Pb	Cd	Hg
	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Mg	Mg	Mg
1990	16.19	13.14	31.35	5.17	43.43	-	-	-	-	42.97	0.08	0.09
1991	16.40	12.59	32.62	5.19	40.70	-	-	-	-	43.42	0.08	0.09
1992	18.47	13.03	37.47	5.85	41.53	-	-	-	-	47.57	0.09	0.10
1993	18.83	13.14	39.64	5.85	40.53	-	-	-	-	47.74	0.09	0.10
1994	20.03	13.49	42.15	5.83	40.04	-	-	-	-	50.07	0.09	0.11
1995	18.91	13.09	39.13	5.94	38.21	-	-	-	-	49.56	0.08	0.10
1996	19.50	12.97	41.20	6.14	37.06	-	-	-	-	49.67	0.09	0.11
1997	19.79	13.12	43.35	5.98	35.55	-	-	-	-	49.69	0.09	0.11
1998	20.22	12.71	46.64	5.87	33.43	-	-	-	-	49.34	0.09	0.11
1999	20.67	12.60	48.93	5.83	32.03	-	-	-	-	48.86	0.09	0.11
2000	22.02	12.54	48.00	5.87	30.81	10.13	5.42	3.01	0.20	49.22	0.10	0.11
2001	21.39	12.36	45.05	6.15	29.58	8.58	4.90	2.69	0.20	47.38	0.09	0.11
2002	21.46	12.98	45.33	6.23	28.99	8.45	4.94	2.67	0.20	45.99	0.09	0.11
2003	21.83	13.80	46.83	6.08	29.44	8.04	4.98	2.72	0.21	45.89	0.09	0.09
2004	21.49	13.74	40.12	5.97	28.16	7.76	4.92	2.69	0.21	33.83	0.09	0.09
2005	21.53	13.53	37.86	5.84	26.99	7.10	4.81	2.67	0.22	28.63	0.09	0.09
2006	21.40	12.73	31.47	5.61	25.20	6.58	4.53	2.51	0.21	28.51	0.08	0.09
2007	21.59	13.16	29.42	5.57	24.28	6.59	4.55	2.54	0.21	29.62	0.08	0.09
2008	20.26	12.12	22.43	5.42	22.44	5.76	3.93	2.00	0.18	30.51	0.08	0.09
2009	20.06	10.76	17.74	4.98	20.26	4.96	3.24	1.70	0.15	30.05	0.07	0.08
2010	18.64	10.88	21.92	5.08	19.05	4.92	3.12	1.62	0.14	30.59	0.06	0.06
2011	21.44	8.71	20.92	4.82	17.08	4.43	2.80	1.43	0.11	29.75	0.07	0.07
2012	21.58	8.38	16.22	4.64	15.59	3.46	2.25	1.21	0.10	27.29	0.07	0.07
2013	16.38	7.37	13.76	4.42	14.54	2.66	1.83	1.04	0.11	24.19	0.05	0.08
2014	17.50	7.09	16.94	4.30	14.58	2.33	1.68	0.97	0.12	24.22	0.05	0.10

Year	Main Pollutants					Particulate Matter				Priority Heavy Metals		
	NO _x	VOC	SO _x	NH ₃	CO	TSP	PM ₁₀	PM _{2.5}	BC	Pb	Cd	Hg
	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Mg	Mg	Mg
2015	15.28	7.39	13.15	4.54	14.08	2.40	1.73	1.01	0.27	25.20	0.05	0.09
2015-1990	-6%	-44%	-58%	-12%	-68%	-	-	-	-	-41%	-39%	-5%
2015-2000	-31%	-41%	-73%	-23%	-54%	-76%	-68%	-67%	33%	-49%	-49%	-18%
2015-2010	-18%	-32%	-40%	-11%	-26%	-51%	-45%	-38%	90%	-18%	-11%	43%

Year	Other Heavy Metals						POPs			
	As	Cr	Cu	Ni	Se	Zn	PCDD/F	PAHs	HCB	PCBs
	Mg	Mg	Mg	Mg	Mg	Mg	g I-Teq	Mg	kg	kg
1990	0.12	0.18	1.32	5.86	0.08	3.79	2.09	13.96	0.05	0.04
1991	0.13	0.18	1.37	6.07	0.08	3.86	2.14	13.57	0.05	0.04
1992	0.14	0.20	1.56	7.09	0.09	4.42	2.23	14.25	0.05	0.04
1993	0.15	0.22	1.58	7.54	0.10	4.66	2.30	14.31	0.05	0.04
1994	0.16	0.23	1.72	7.87	0.10	4.90	2.34	12.44	0.05	0.04
1995	0.15	0.22	1.69	7.24	0.10	4.65	2.36	11.19	0.06	0.04
1996	0.16	0.23	1.77	7.67	0.10	4.89	2.40	10.17	0.06	0.05
1997	0.16	0.23	1.84	8.10	0.10	5.07	2.45	9.34	0.06	0.04
1998	0.17	0.24	1.93	8.88	0.11	5.38	2.49	8.83	0.06	0.04
1999	0.18	0.25	2.02	9.47	0.11	5.65	2.53	8.13	0.06	0.04
2000	0.19	0.26	2.23	9.94	0.12	5.98	2.57	6.57	0.06	0.04
2001	0.19	0.26	2.15	9.68	0.12	5.85	2.59	6.43	0.06	0.04
2002	0.19	0.26	2.20	10.06	0.12	6.03	2.62	6.09	0.06	0.04
2003	0.21	0.27	2.27	10.83	0.13	6.39	1.04	6.53	0.02	0.03
2004	0.22	0.28	2.29	11.32	0.13	6.62	0.52	5.24	0.01	0.03
2005	0.23	0.29	2.33	12.05	0.14	6.92	0.52	4.22	0.01	0.03
2006	0.21	0.28	2.33	11.22	0.13	6.69	0.50	3.35	0.01	0.04
2007	0.22	0.29	2.43	11.58	0.13	6.93	0.53	2.12	0.01	0.04
2008	0.23	0.30	2.51	12.10	0.14	7.15	0.53	1.50	0.01	0.04
2009	0.20	0.27	2.44	10.61	0.12	6.50	0.48	1.28	0.01	0.03
2010	0.14	0.23	2.41	7.13	0.09	5.27	0.47	1.28	0.01	0.03
2011	0.17	0.25	2.39	8.89	0.11	5.80	0.45	1.35	0.01	0.03
2012	0.18	0.25	2.25	9.40	0.14	5.81	0.43	1.34	0.01	0.03
2013	0.12	0.21	1.96	5.19	0.08	4.34	0.56	1.07	0.01	0.04
2014	0.13	0.22	1.98	5.20	0.09	4.48	0.36	0.99	0.01	0.04
2015	0.12	0.22	2.04	5.28	0.09	4.51	0.40	1.22	0.01	0.04

Year	Other Heavy Metals						POPs			
	As	Cr	Cu	Ni	Se	Zn	PCDD/F	PAHs	HCB	PCBs
	Mg	Mg	Mg	Mg	Mg	Mg	g I-Teq	Mg	kg	kg
2015-1990	0%	22%	54%	-10%	6%	19%	-81%	-91%	-83%	5%
2015 - 2000	-35%	-16%	-8%	-47%	-28%	-25%	-84%	-81%	-85%	0%
2015-2010	-10%	-6%	-15%	-26%	-0.5%	-14%	-15%	-5%	49%	56%

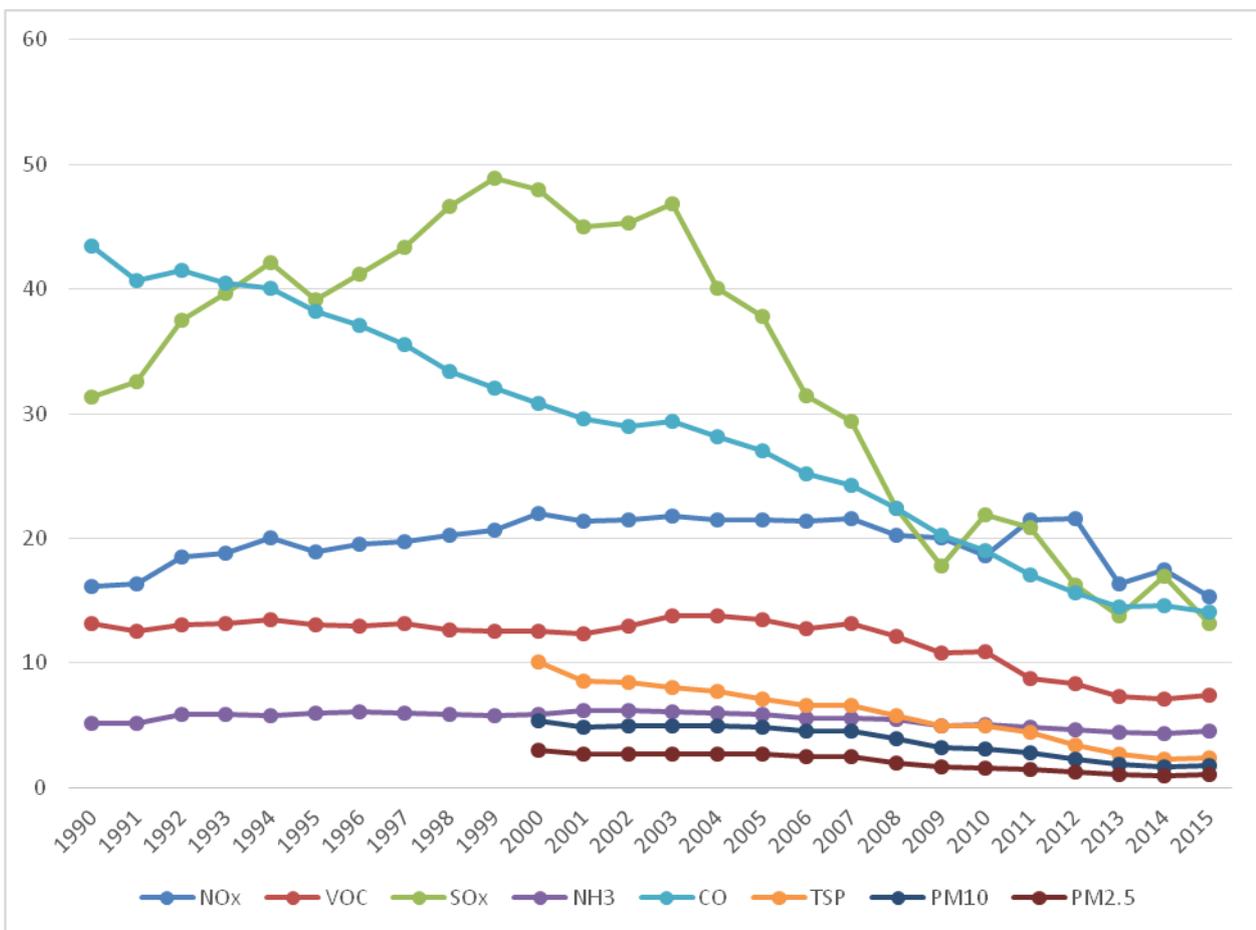


Figure 9: Emission trends 1990-2015 (Main Pollutants and Particulates).

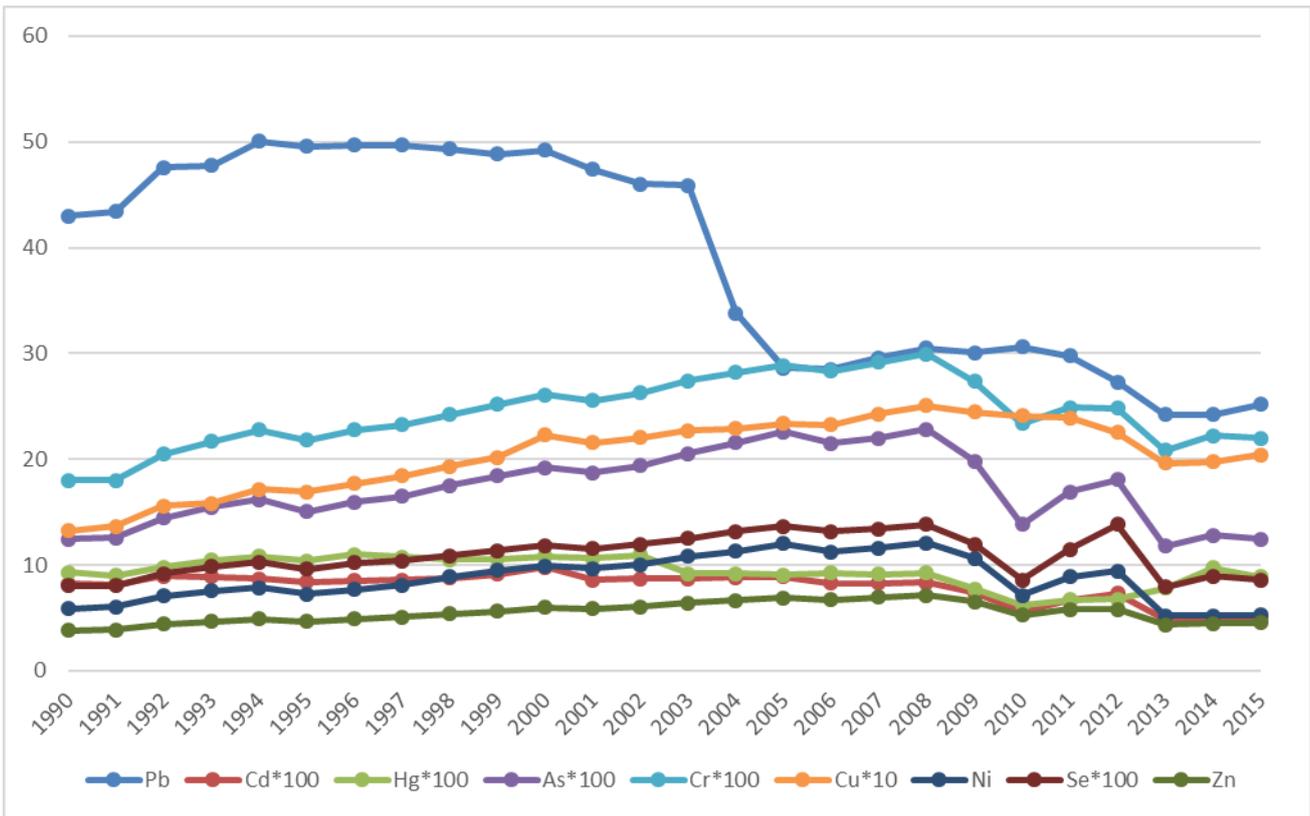


Figure 10: Emission trends 1990-2015 (Heavy Metals).

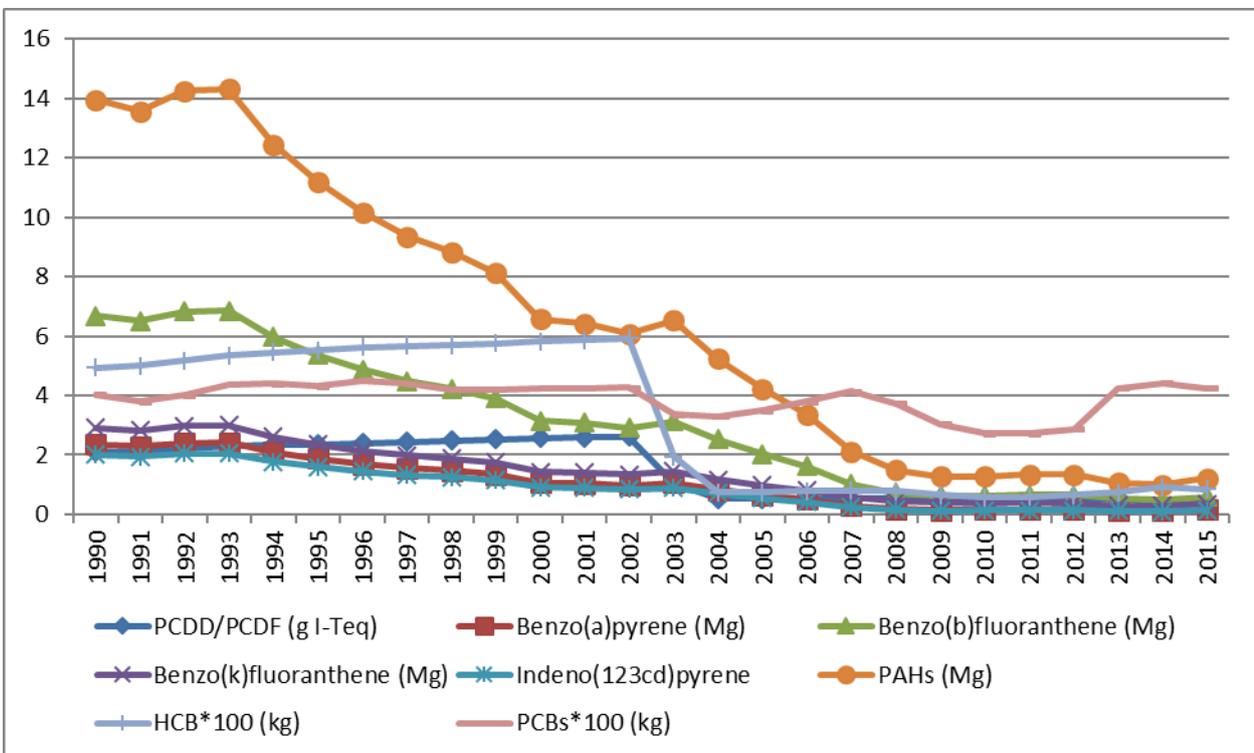


Figure 11: Emission trends 1990-2015 (Persistent Organic Pollutants).

3.1 Trends for Nitrogen Oxides (NO_x)

The Cyprus NO_x emissions (NO and NO₂) decreased by 0.91 Gg in the 1990 – 2015 period, corresponding to 6% of the national total in 1990 and decreased by 6.74 Gg in the 2000 – 2015 period, corresponding to 31% of the national total in 2000 (**Figure 12-13**). The main contributors to the National total NO_x emissions are the F_Road transport, the A_Public Power and the B - Industry sectors. The emissions due to the Industry Sector remains almost constant throughout the years.

Regarding the emissions from the F_Road transport sector, the emissions per vehicle decreased significantly during this period (1990 - 2015) due to the implementation of new car technologies and the usage of better quality fuels, but were, somehow, counterbalanced by an increase in the number and mileage per year of vehicles.

As regards to the A_Public Power sector, the NO_x emissions were increased by 2.84 Gg for the period between 2010 – 2012, corresponding to 15.4% of the national total. This was due to the installation and operation of a number of temporary-mobile units (Internal Combustion Engines) in the island. That installation was a result of the reduction in generating capacity of the Electricity Authority of Cyprus (EAC) due to the extensive damage of the Vassilikos PS caused by an explosion on July 11th, 2011. More specifically, the temporary-mobile ICE engines installed in all three Power Stations have high NO_x emissions. These small capacity mobile units do not have any NO_x abatement technology installed. In addition, the 5×30 MWe HFO plants that operate at the Moni PS, and the 6×60 MWe HFO plants along with the 6×17 MWe HFO Internal Combustion Engines operating at the Dhekelia PS, have higher NO_x emissions compared to the newest power plants installed at the Vassilikos PS that were not in operation due to the damages. Therefore, a significant increase in the total NO_x emissions at a national level is observed in 2012. More details were given in the Cyprus Informative Inventory Report published last year in the EIONET Central Data Repository (CDR) (http://cdr.eionet.europa.eu/cy/un/UNECE_CLRTAP_CY/envvqgjug/) [9].

The big decrease in 2013, regarding NO_x emissions, was due to the complete restoration of the Vassilikos PS. This plant uses a newer technology for combustion, with lower NO_x emissions compared to the temporary installed ICE plants and as a consequence the NO_x emissions from the energy sector was significantly decreased. A small increase was observed in 2014 due to the increased energy demand as a consequence of the relevant Cyprus economy recovery. A small decrease was observed in 2015 due to the lower use of the ICE temporary plants in Dhekelia PS.

Another reason for the overall decrease of the NO_x emissions that occurred in recent years was the increase of the penetration of the Renewable Energy Sources. In 2010 the electricity produced from RES was 61 GWh compared to 357 GWh produced in 2015. This is an increase of 485%.

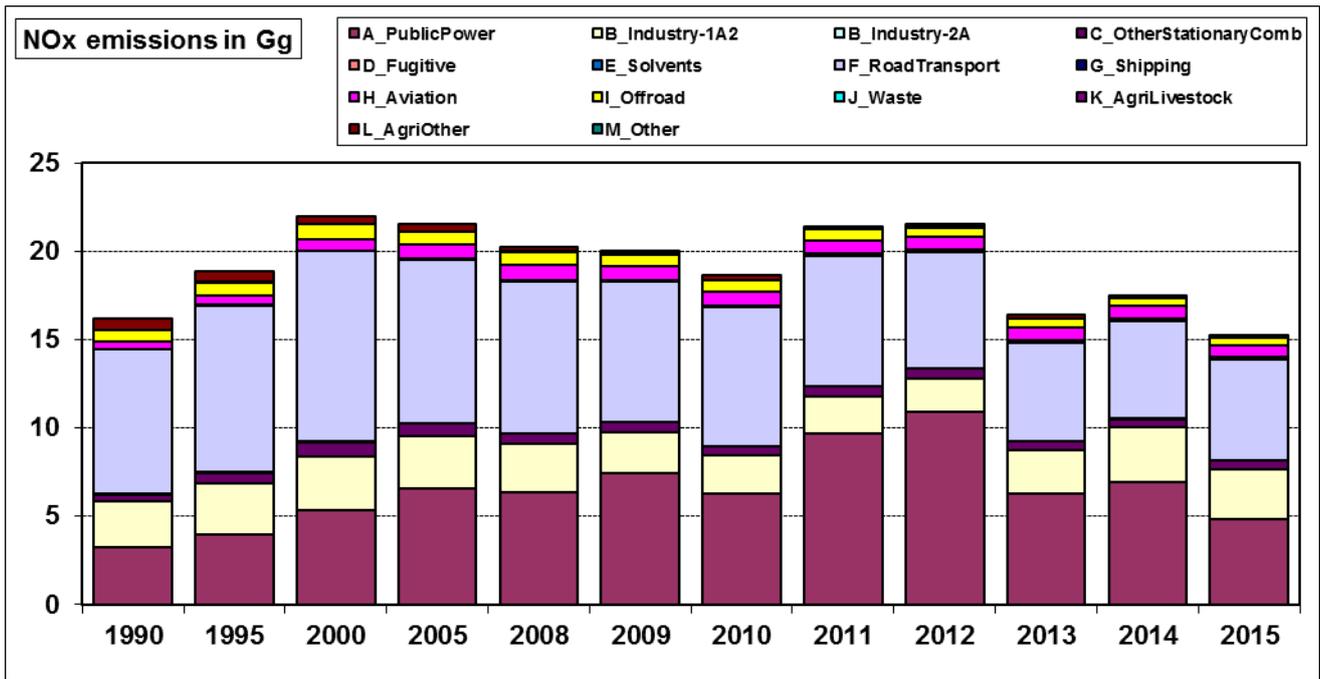


Figure 12: NO_x emissions trend 1990 – 2015

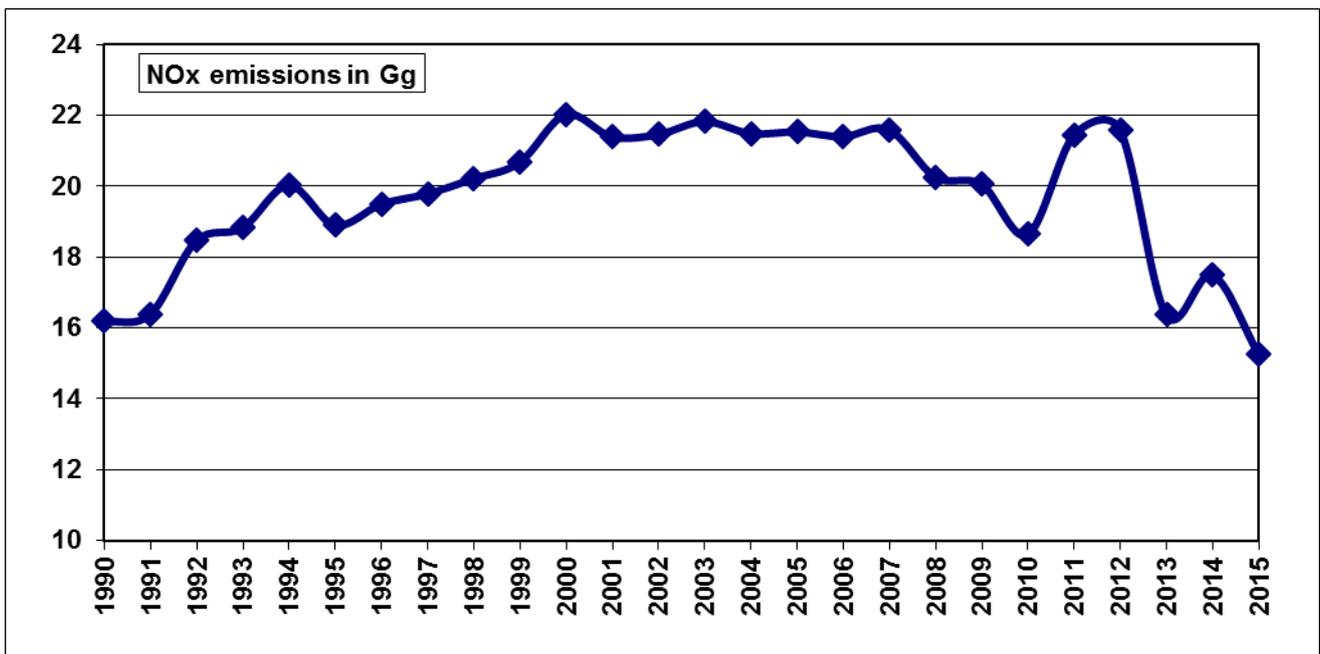


Figure 13: National total NO_x emissions for the period 1990 – 2015.

The variations observed during the years 2008 to 2011 are due to the following reasons:

- 1) The methodology used to calculate emissions differs both per year and per pollutant. Actually, from 2008 and on, we are using Tier 3 as a methodology to estimate the NO_x, CO and TSP emissions from Power stations.

This is due to the fact that in 2008 the Electricity Authority of Cyprus installed automatic instruments for on-line measurements and the jumps observed between 2008 -2010 are due

to the fact that Electricity Authority of Cyprus used for electricity production various combinations of its power plants.

- 2) The explosion happened in 2011 and the need for the Electricity Authority of Cyprus to use of temporary-mobile units (Internal Combustion Engines) with higher pollutants emissions. For more details, please refer to IIR of 2015 [9].

3.2 Trends for Non-Methane Volatile Organic Compounds (NMVOC)

The Cyprus NMVOC emissions decreased by 5.75 Gg in the 1990 – 2015 period, corresponding to 44% of the national total in 1990 and decreased by 5.15 Gg in the 2000 – 2015 period, corresponding to 41% of the national total in 2000 (**Figures 14-15**). The main contributors to this decrease were the transport sector, which from 6.85 Gg in 1990 went to 2.51 Gg in 2015 and the Solvents sector from 4.49 Gg in 2005 went to 2.14 Gg in 2015 The latter was due to the full implementation of the EU relevant Directive 2004/42/EC.

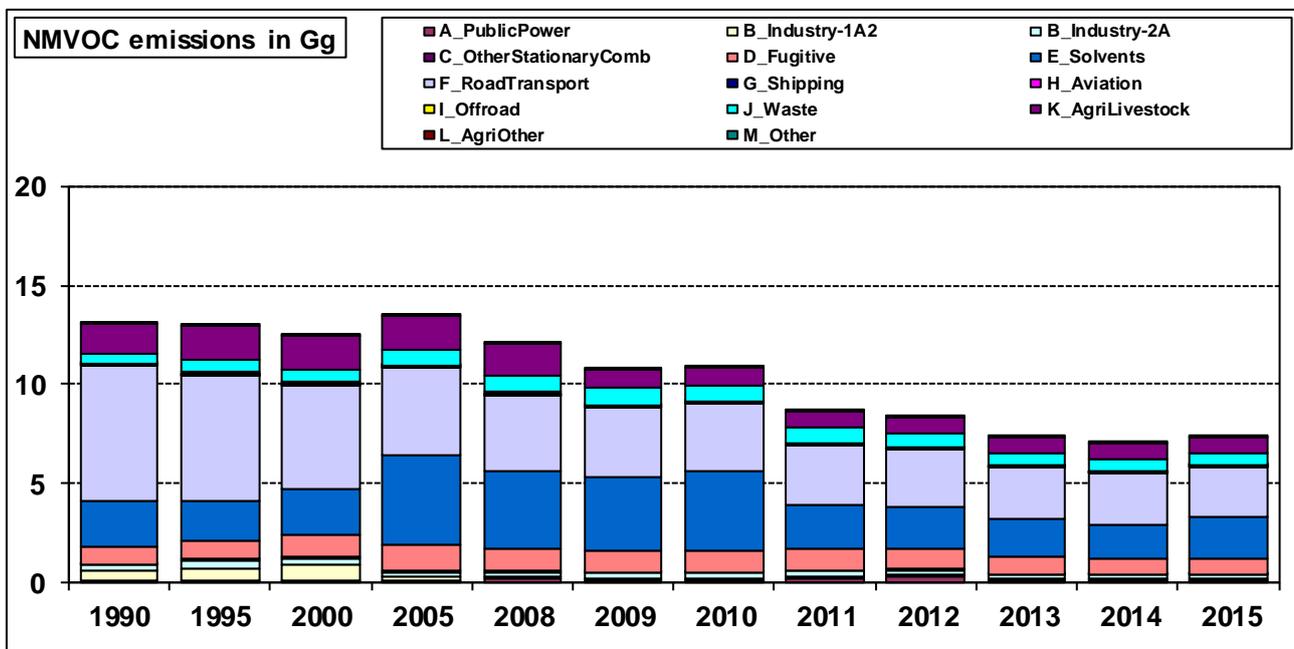


Figure 14: NMVOC emissions trend 1990 – 2015.

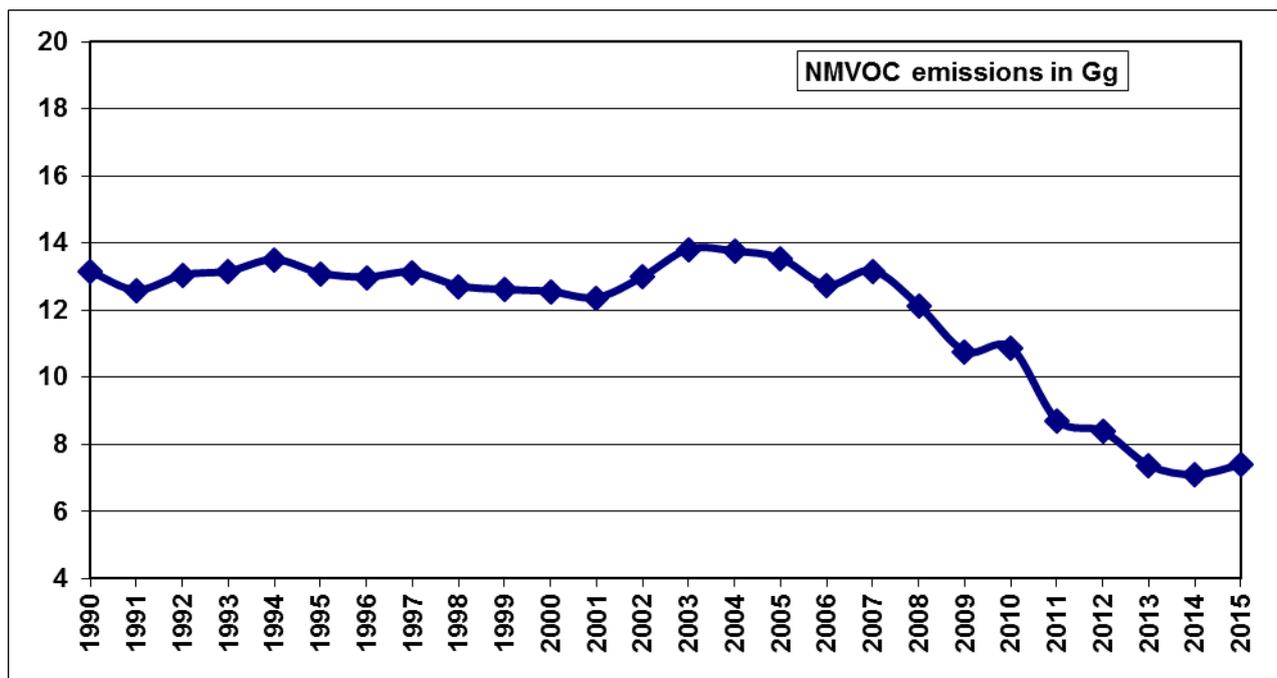


Figure 15: National total NMVOC emissions for the period 1990 – 2015.

3.3 Trends for Sulphur Dioxide (SO₂)

The Cyprus SO_x emissions (reported as SO₂) decreased by 18.19 Gg in the 1990 – 2015 period, corresponding to 58% of the national total in 1990 and decreased by 34.85 Gg in the 2000 – 2015 period, corresponding to 73% of the national total in 2000 (**Figure 16-17**). The main contributions to this decrease came from the A_Public Power, B_Industry, C_Other Stationary Combustion and F_Road Transport sectors. The sulphur content in fuels consumed by those sectors was reduced. This is mainly due to the transposition and enforcement of the relevant EU Directives. Currently, the energy sector is responsible for almost 86% of the national SO_x emissions.

During the years 2010 to 2014 it was observed an increase in SO_x emissions due to the fact that the Flue - Gas Desulphurization Unit (FGD) installed in the Steam Turbine Unit 3 of the Vassilikos PS was not in operation.

The decrease observed in the SO_x emissions in 2012 was due to the fact that the temporary ICE engines installed were using diesel with low sulphur content. These temporary ICE engines were installed in order to anticipate the reduction in generating capacity of Electricity Authority of Cyprus (EAC) due to the extensive damage of Vassilikos PS caused by an explosion on July 11th, 2011.

In 2013 the SO_x emissions were decreased even more due to the fact that the Vassilikos PS were completely restored. A small increase was observed in 2014 due to the increased energy demand as a consequence of the relevant Cyprus economy recovery.

The decrease observed in the SO_x emissions in 2015 was due to the fact that the Flue-Gas Desulphurization Unit (FGD) installed in the Steam Turbine Unit 3 of the Vassilikos PS was again in full operation.

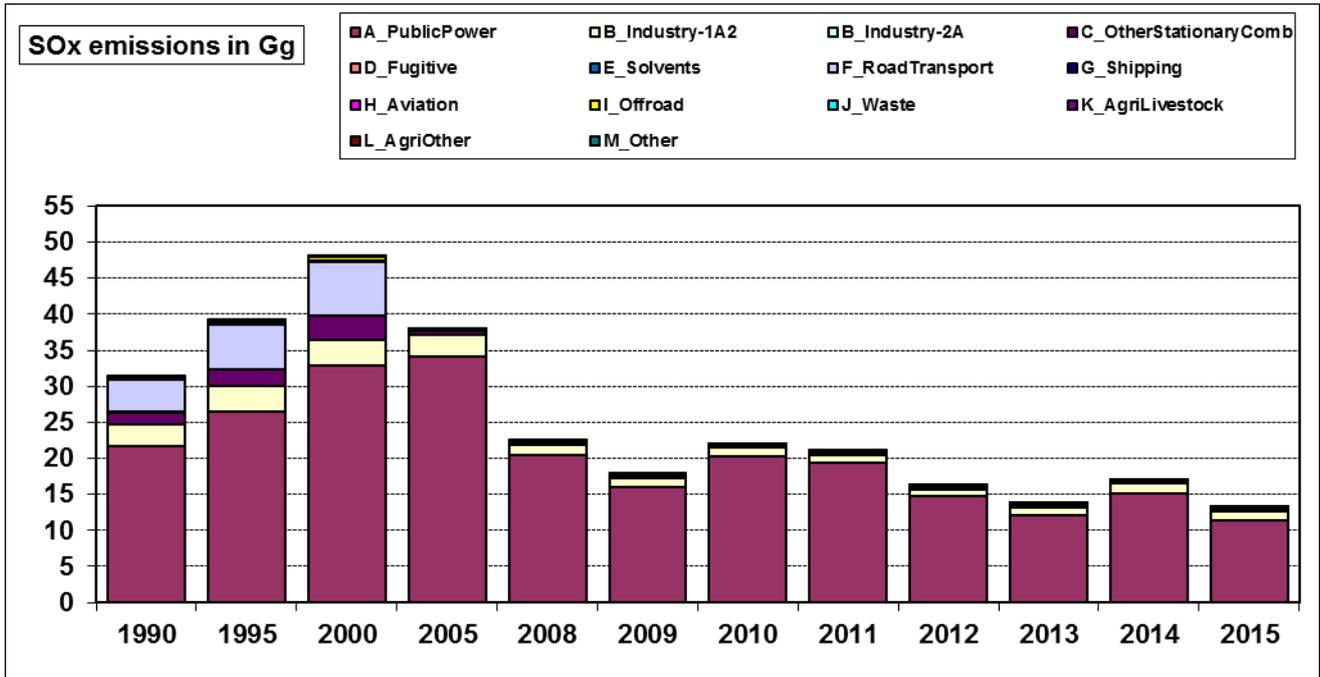


Figure 16: SO_x emissions trend 1990 – 2015.

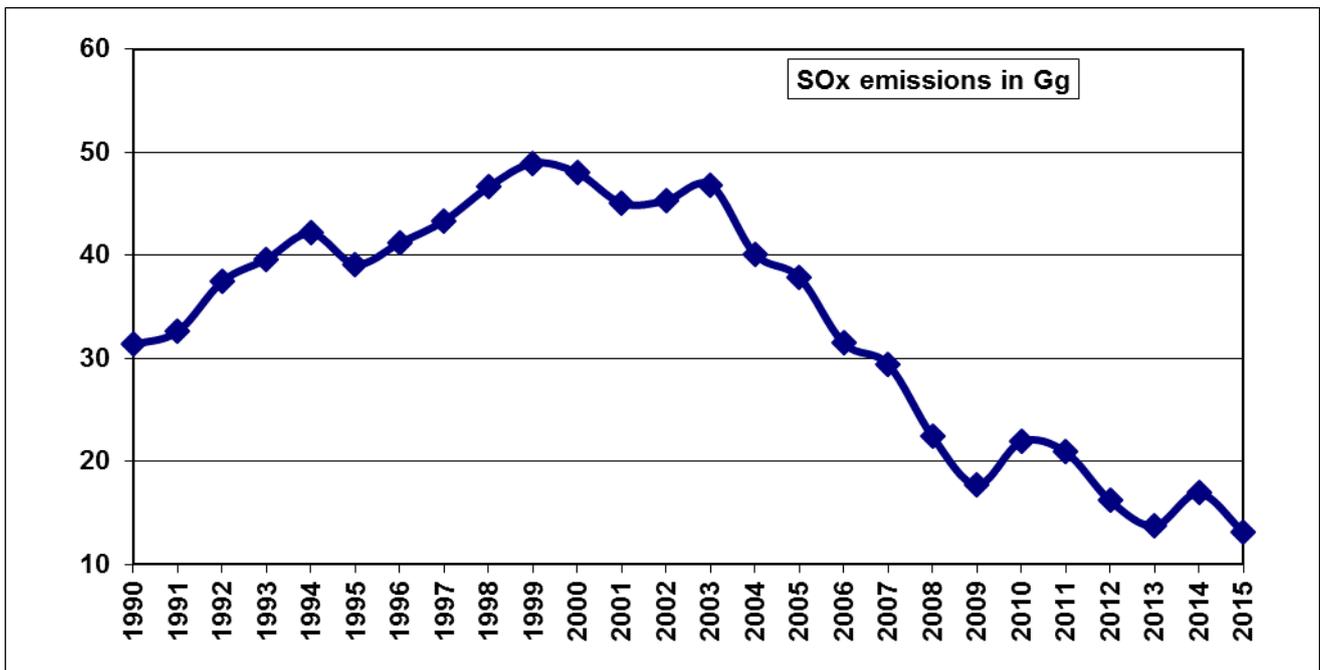


Figure 17: National total SO_x emissions for the period 1990 – 2015.

3.4 Trends for Ammonia (NH₃)

The Cyprus NH₃ emissions decreased by 0.63 Gg in the 1990 – 2015 period, corresponding to 12% of the national total in 1990 and decreased by 1.33 Gg in the 2000 – 2015 period,

corresponding to 23% of the national total in 2000 (**Figure 18-19**). This decrease occurred in the agricultural sources, mainly due to measures taken to reduce NH₃ emissions during the application of manure to the soil and the reduction of Nitrogen contained in the modern fertilizers (1.23 Gg 1990 to 0.34 Gg 2015 in L_AgriOther sector). Approximately 95% of ammonia emissions come from agricultural sources (K_AgriLivestock sector and L_AgriOther sector).

A small increase observed between the years of 2014 and 2015 was due to the increased numbers of animals (cows and fattening pigs).

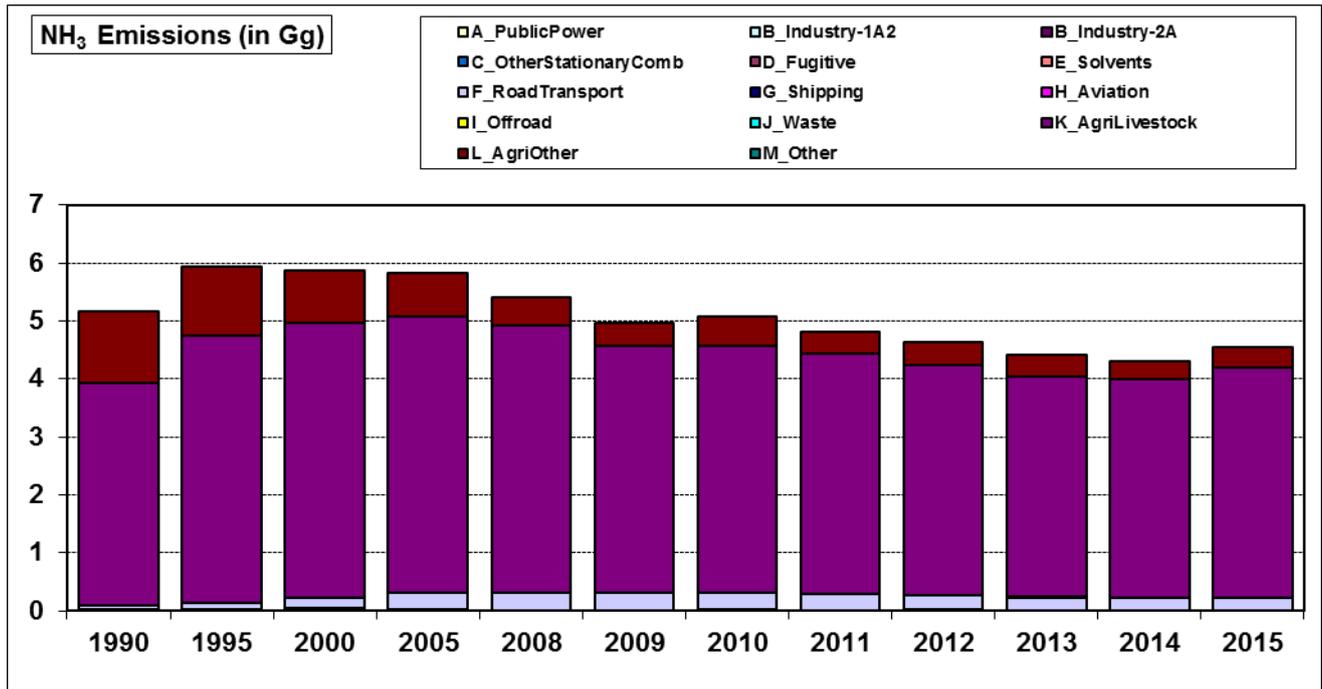


Figure 18: NH₃ emissions trend 1990 – 2015.

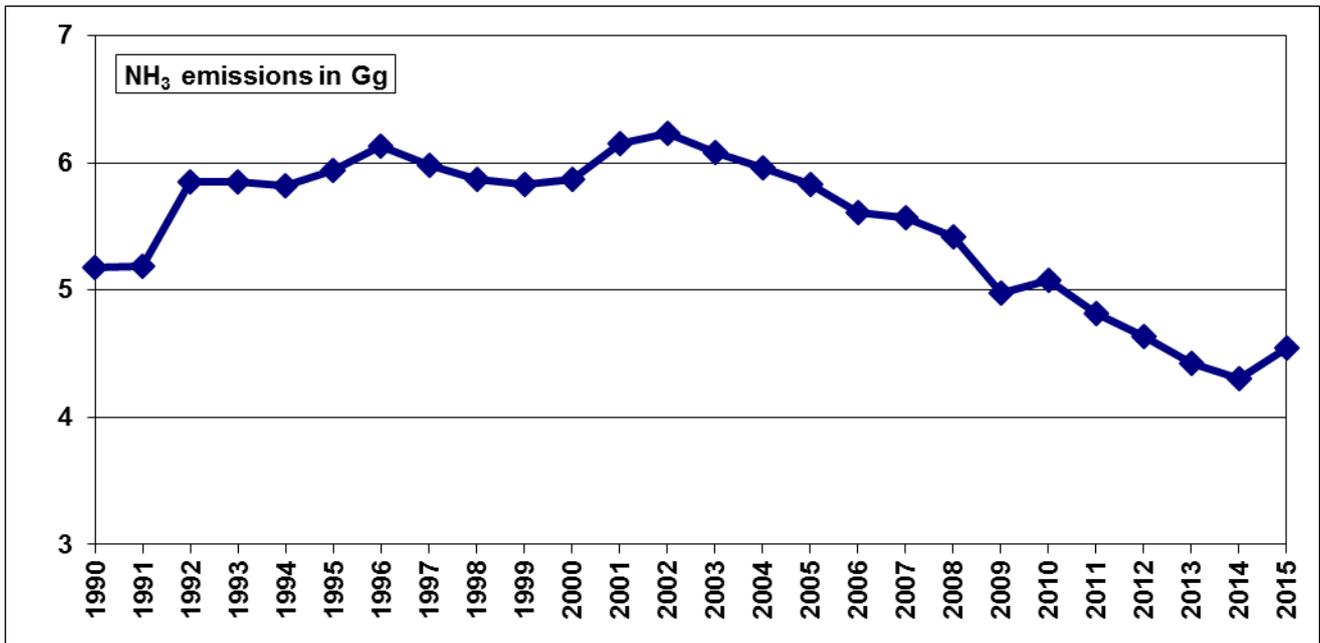


Figure 19: National total NH₃ emissions for the period 1990 – 2015.

3.5 Trends for Particulate Matter (TSP, PM₁₀, PM_{2.5})

The Cyprus particulate matter emissions are presented in **Figure 20-23**. The PM₁₀ emissions decreased by 3.69 Gg in the 2000 – 2015 period, corresponding to 68% of the national total in 2000. The main contributors to this decrease are the A_Public Power, the F_Road Transport and the B_Industry.

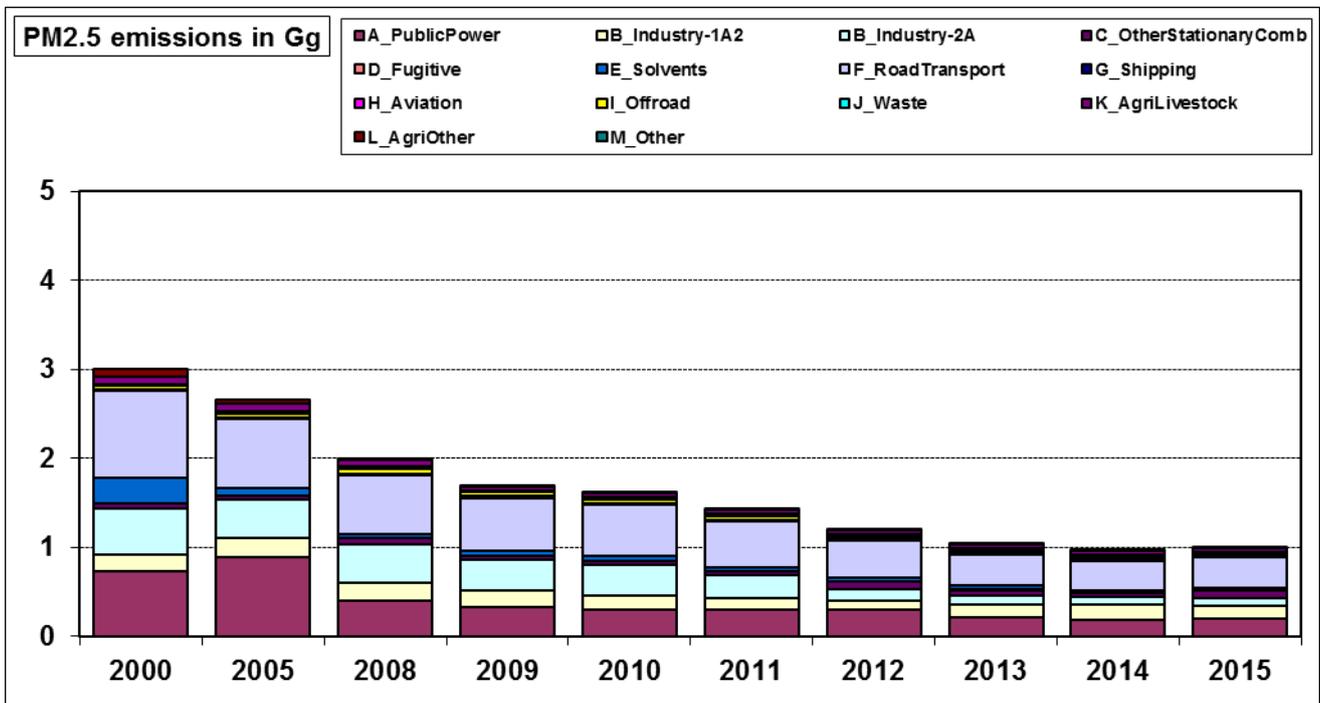


Figure 20: PM_{2.5} emissions trend 2000 – 2015.

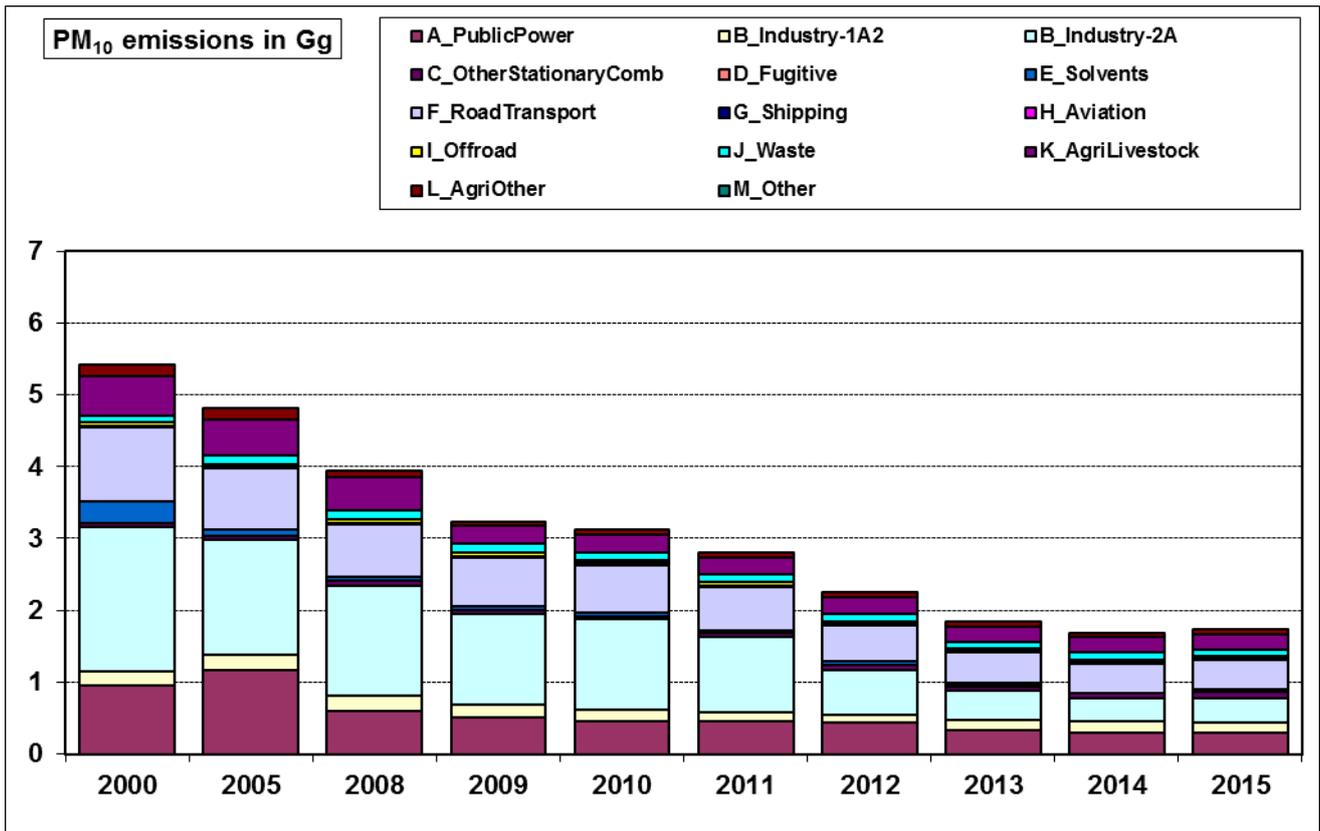


Figure 21: PM₁₀ emissions trend 2000 – 2015.

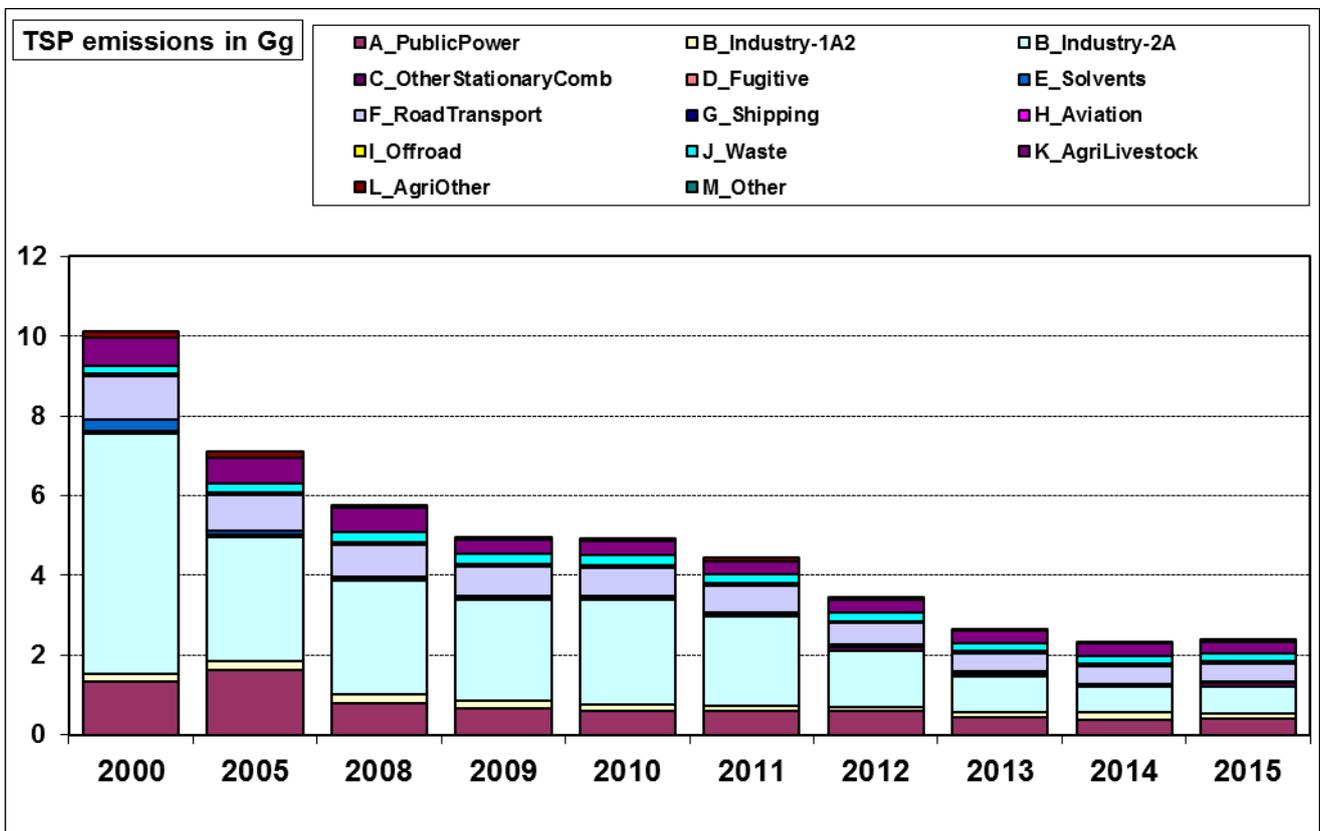


Figure 22: TSP emissions trend 2000 – 2015.

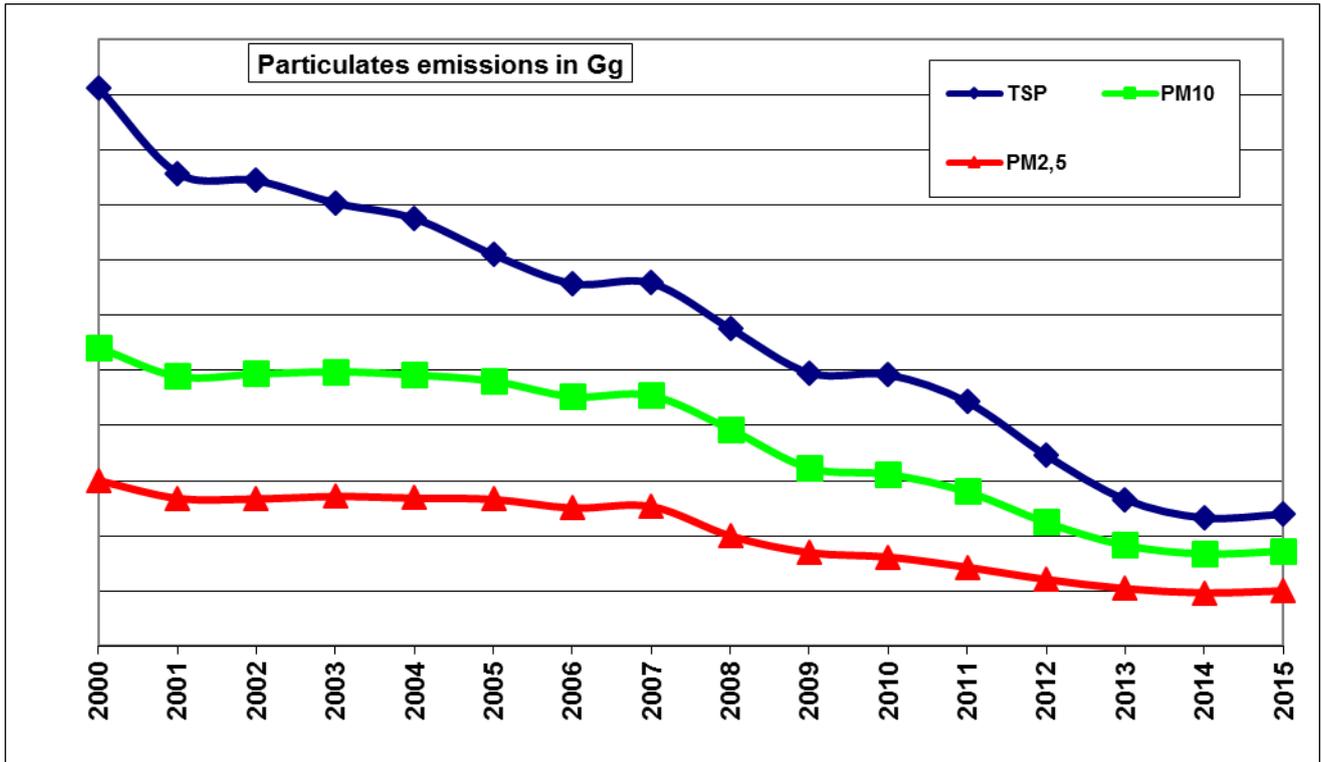


Figure 23: National total TSP, PM₁₀ and PM_{2.5} emissions for the period 2000 – 2015.

The PM_{2.5} emissions decreased by 2.0 Gg in the 2000 – 2015 period, corresponding to 67% of the national total in 2000. The main contributors to this decrease are the A_Public Power, the F_Road Transport and the B_Industry.

The TSP emissions decreased by 7.73 Gg in the 2000 – 2015 period, corresponding to 76% of the national total in 2000. The main contributors to this decrease are the A_Public Power, the F_Road Transport and the B_Industry.

3.6 Trends for Carbon Monoxide (CO)

The Cyprus CO emissions decreased by 29.36 Gg in the 1990 – 2015 period, corresponding to 68% of the national total in 1990 and decreased by 16.73 Gg in the 2000 – 2015 period, corresponding to 54% of the national total in 2000 (**Figure 24-25**). The main contributor to this decrease is the F_Road Transport sector. Currently, the Road Transport sector is responsible for about 69% of the national CO emissions in 2015.

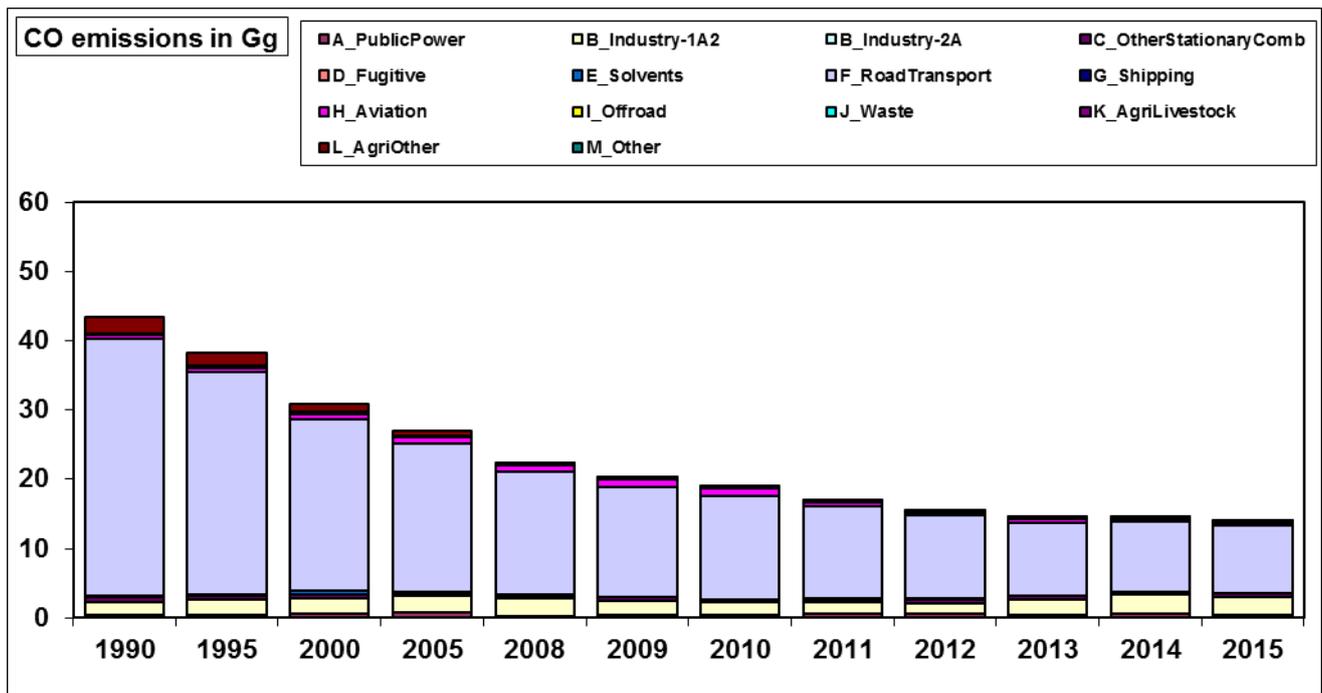


Figure 24: CO emissions trend 1990 – 2015.

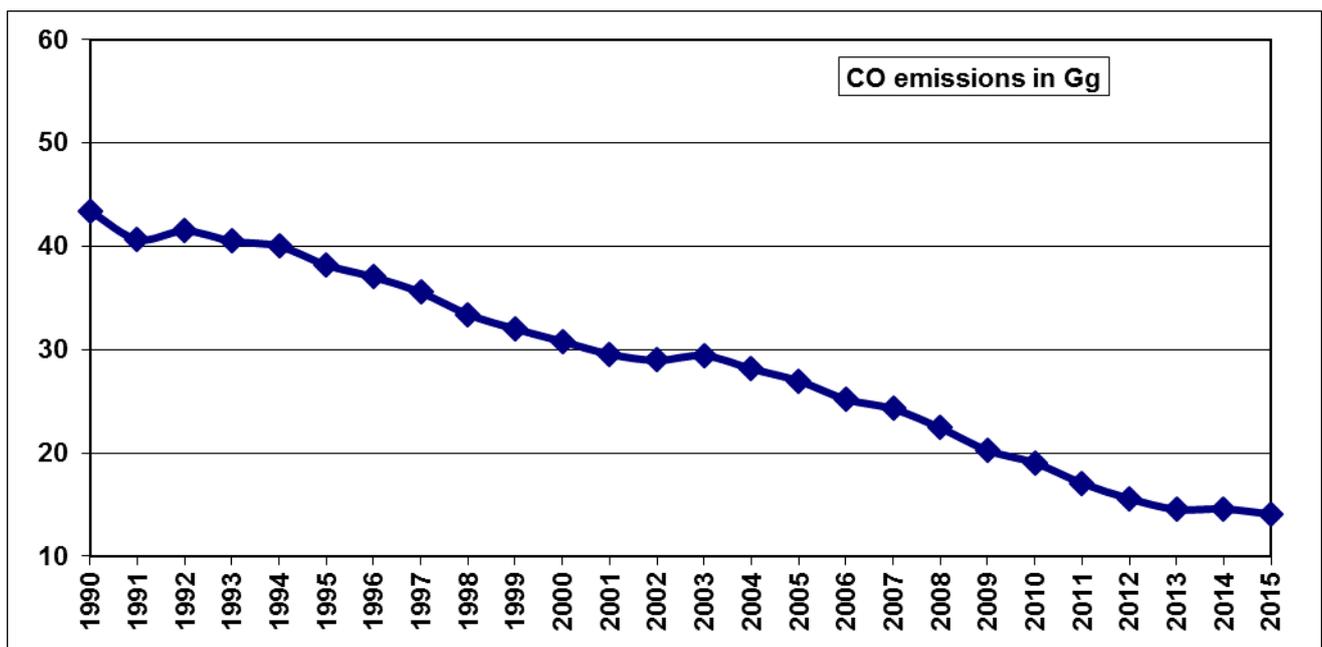


Figure 25: National total CO emissions for the period 1990 – 2015.

3.7 Trends for Heavy Metals (Pb, Cd, Hg)

The Cyprus Pb emissions decreased by 17.77 Mg in the 1990 – 2015 period, corresponding to 41% of the national total in 1990 and decreased by 24.02 Mg in the 2000 – 2015 period, corresponding to 49% of the national total in 2000 (**Figure 26-27**). This decrease is solely attributed to the F_Road Transport sector, where, due to the big reduction of Pb content of the petrol, the Pb emissions were dramatically reduced. The remaining emission source, apart from the F_Road Transport sector, is the B_Industry sector. Currently, the Road Transport sector (1A3b) is responsible for about 99% of the national Pb emissions in 2015.

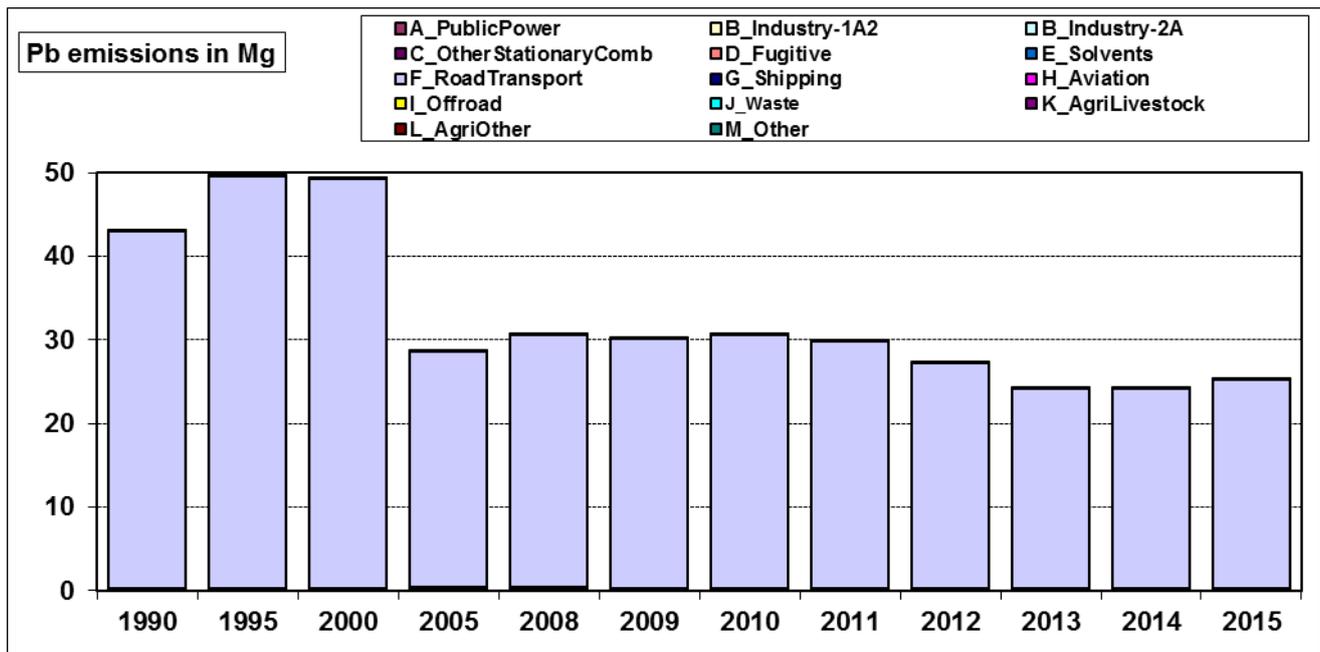


Figure 26: Pb emissions trend 1990 – 2015.

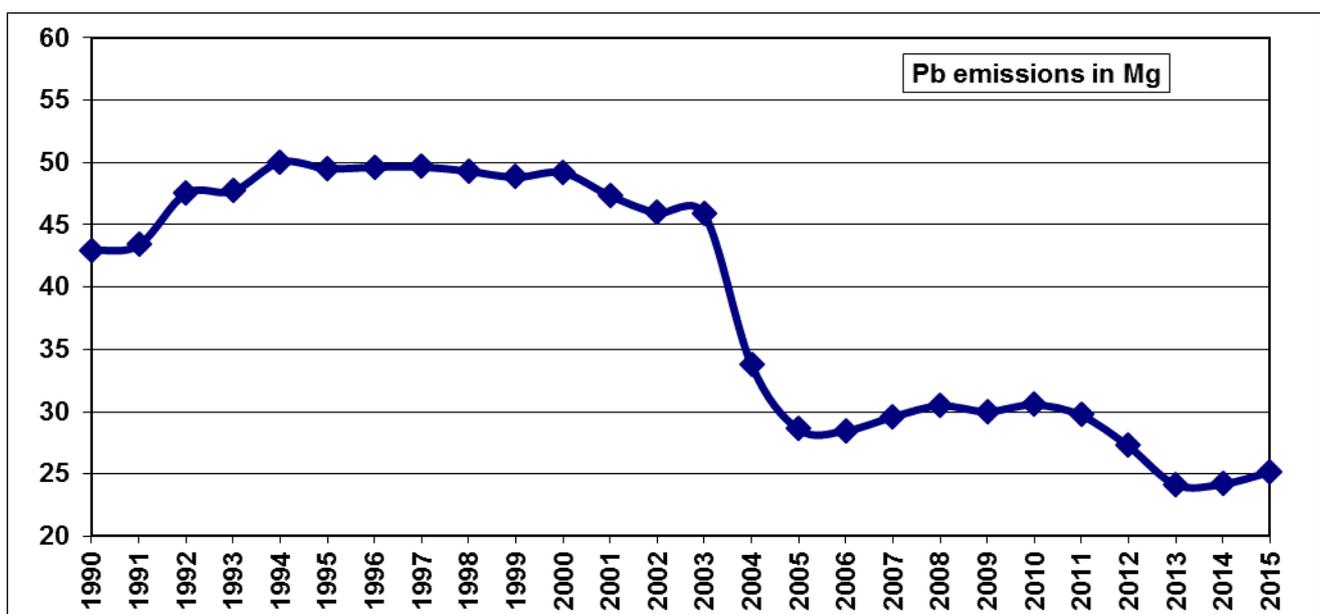


Figure 27: National total Pb emissions for the period 1990 – 2015.

The Cyprus Cd national emissions decreased by 0.03 Mg in the 1990 – 2015 period, corresponding to 39% of the national total in 1990 and decreased by 0.05 Mg in the 2000 – 2015 period, corresponding to 49% of the national total in 2000 (**Figure 28-29**). The big decrease occurred between 2012 and 2013 (34% of the national total in 2012) was due to the A_Public Power sector. The Moni Power Stations was almost shut down and the ICE units of Dhekelia PS worked fewer hours. In Cyprus, there are not any metal industries. Currently, A_Public Power (NFR 1A1a) and Stationary Combustion for Non – metallic minerals (NFR 1A2f) are responsible for about 75% of the national Cd emissions in 2015.

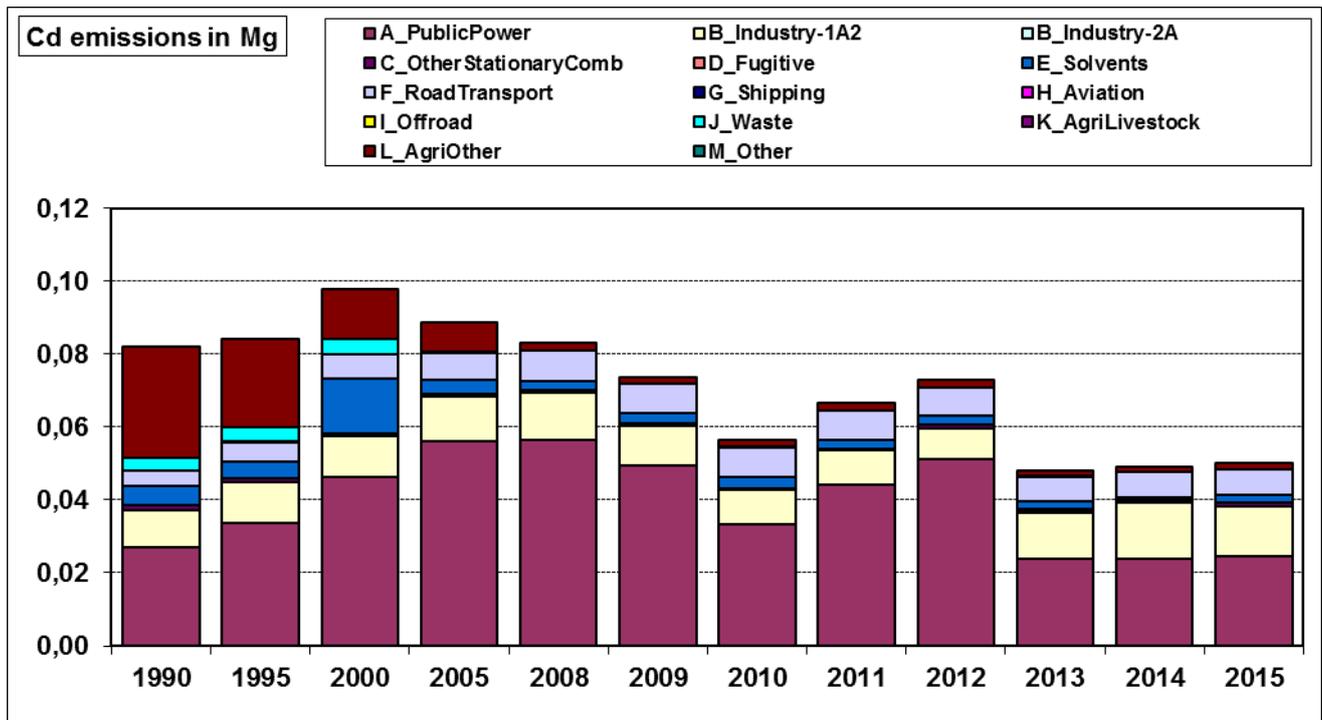


Figure 28: Cd emissions trend 1990 – 2015.

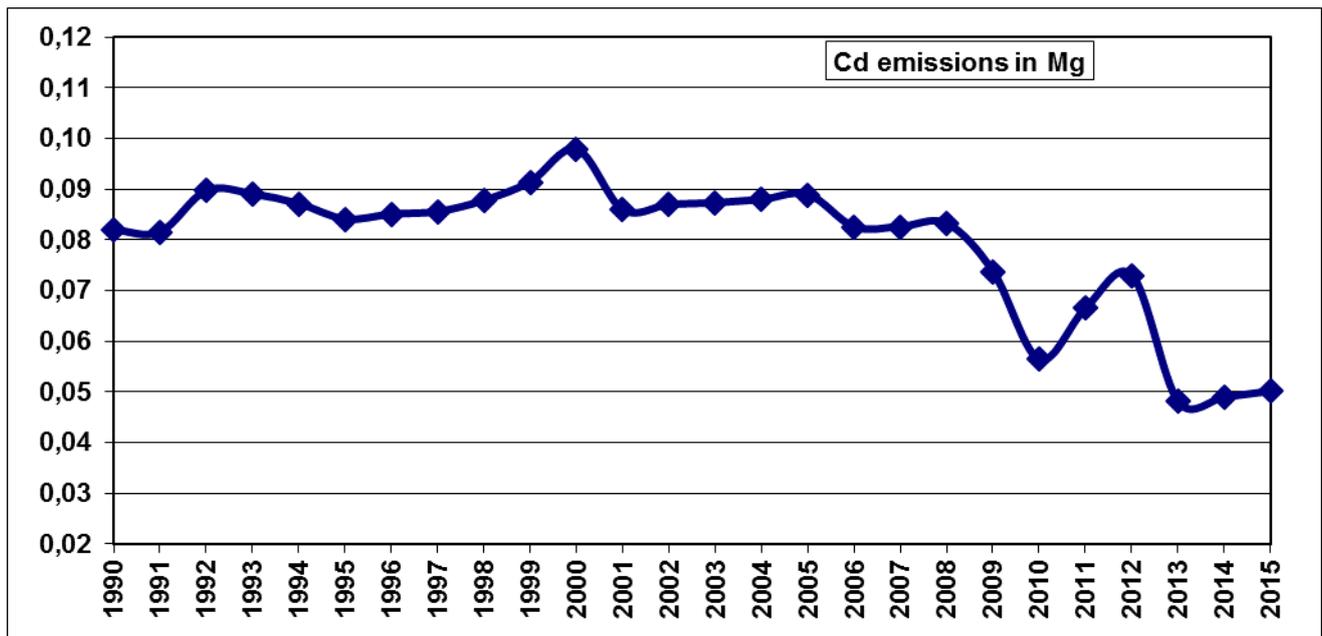


Figure 29: National total Cd emissions for the period 1990 – 2015.

The Cyprus Hg emissions increased by 0.005 Mg in the 1990 – 2015 period, corresponding to 5% of the national total in 1990 and decreased by 0.02 Mg in the 2000 – 2015 period, corresponding to 18% of the national total in 2000 (**Figure 30-31**). The main contributors of Hg emissions in Cyprus are the B_Industry [Non-metallic minerals public sector (NFR 1A2f)] and A_Public Power (NFR 1A1a) with 91% and 8% of the national Hg emissions in 2014, respectively.

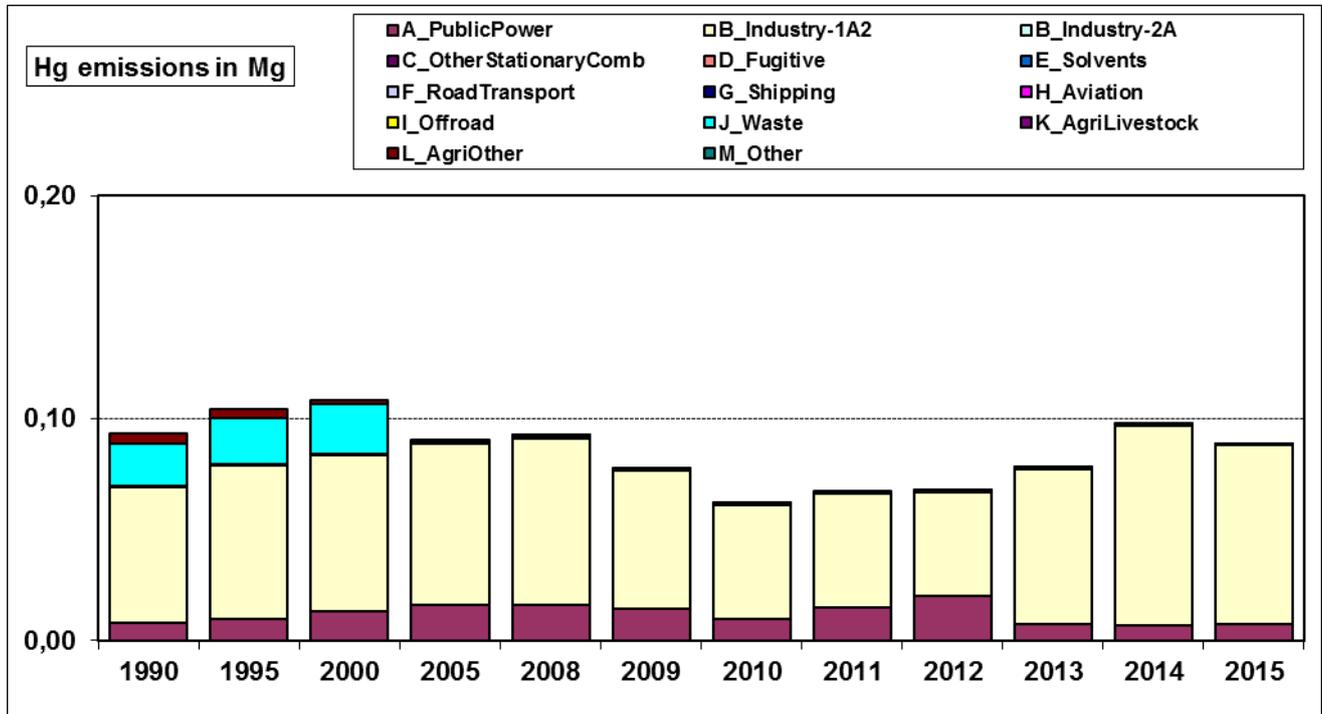


Figure 30: Hg emissions trend 1990 – 2015.

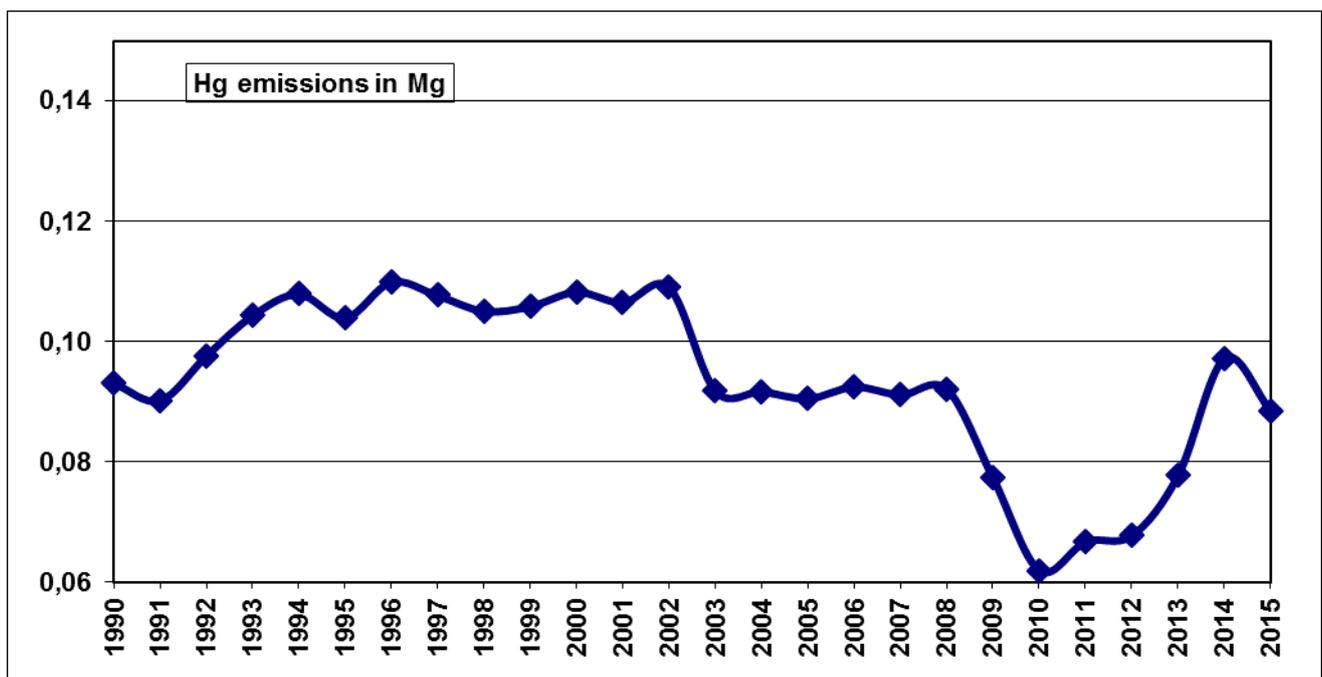


Figure 31: National total Hg emissions for the period 1990 – 2015.

3.8 Trends for Dioxins (PCDD/PCDF)

The Cyprus PCDD/PCDF emissions decreased by 1.69 g I-Teq in the 1990 – 2015 period, corresponding to 81% of the national total in 1990 and decreased by 2.17 g I-Teq in the 2000 – 2015 period, corresponding to 84% of the national total in 2000 (**Figure 32-33**). This decrease is mainly due to the J_Waste sector, as clinical waste incineration plant was terminated in 2003 and all clinical wastes are subjected to sterilization. A small increase was observed in 2013 due to the drillings occurred in Cyprus exclusive economic zone for the exploration of hydrocarbons. The drillings stopped in 2014.

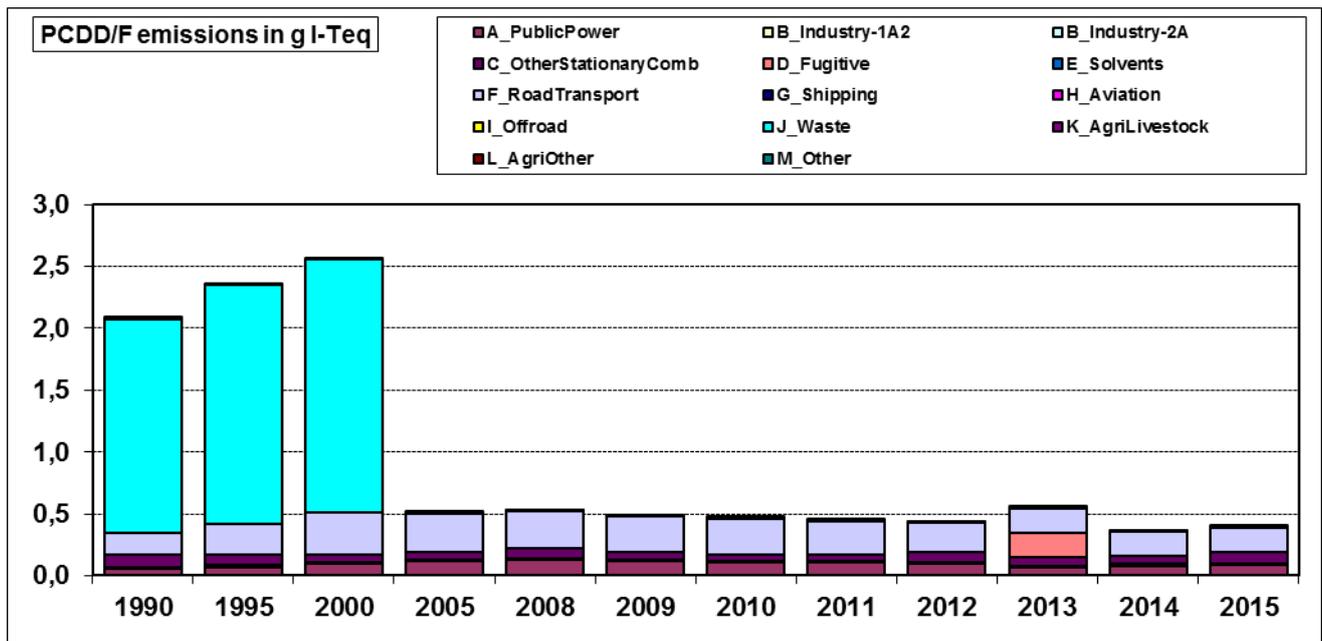


Figure 32: PCDD/F emissions trend 1990 – 2015.

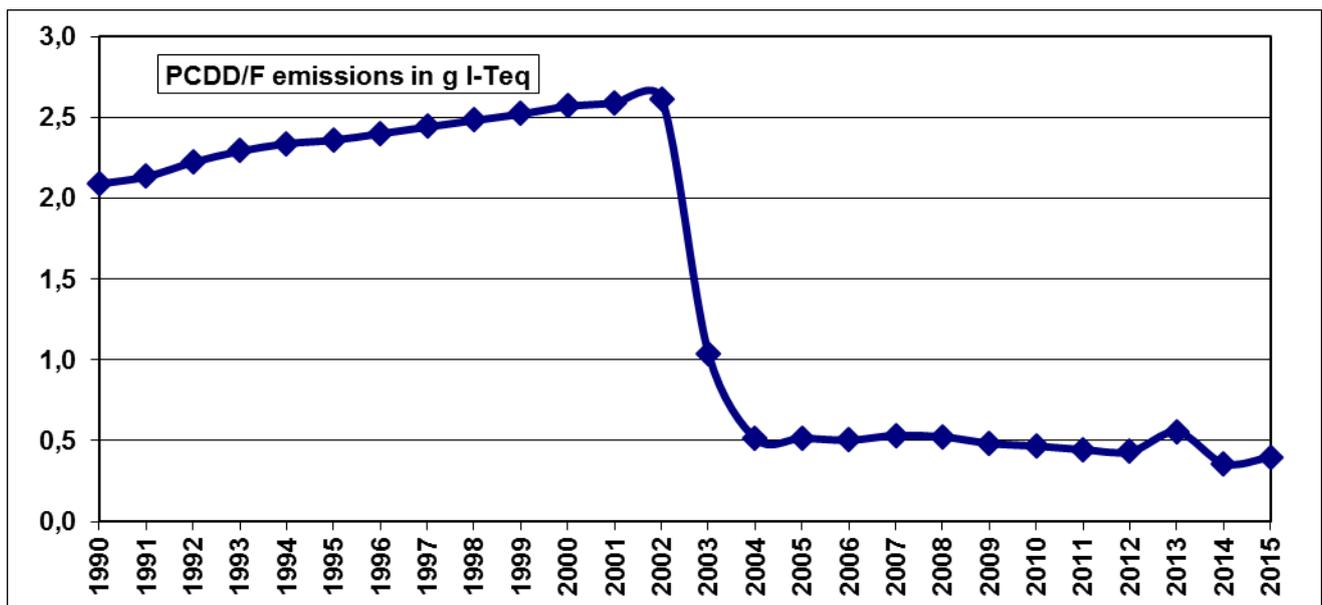


Figure 33: National total PCDD/F emissions for the period 1990 – 2015.

3.9 Trends for Polycyclic Aromatic Hydrocarbons (PAHs)

The Cyprus PAHs emissions decreased by 12.73 Mg in the 1990 – 2015 period, corresponding to 91% of the national total in 1990 and decreased by 5.34 Mg in the 2000 – 2015 period, corresponding to 81% of the national total in 2000 (

Figure 34-35). This decrease is mainly due to the agricultural sector (L_AgriOther sector – 3F Field Burning), where the amount of the crop residue burned has been reduced significantly over the years due to the intensive campaign of the responsible authorities (MARDE) and the enforcement of a new legislation against the uncontrolled burnings.

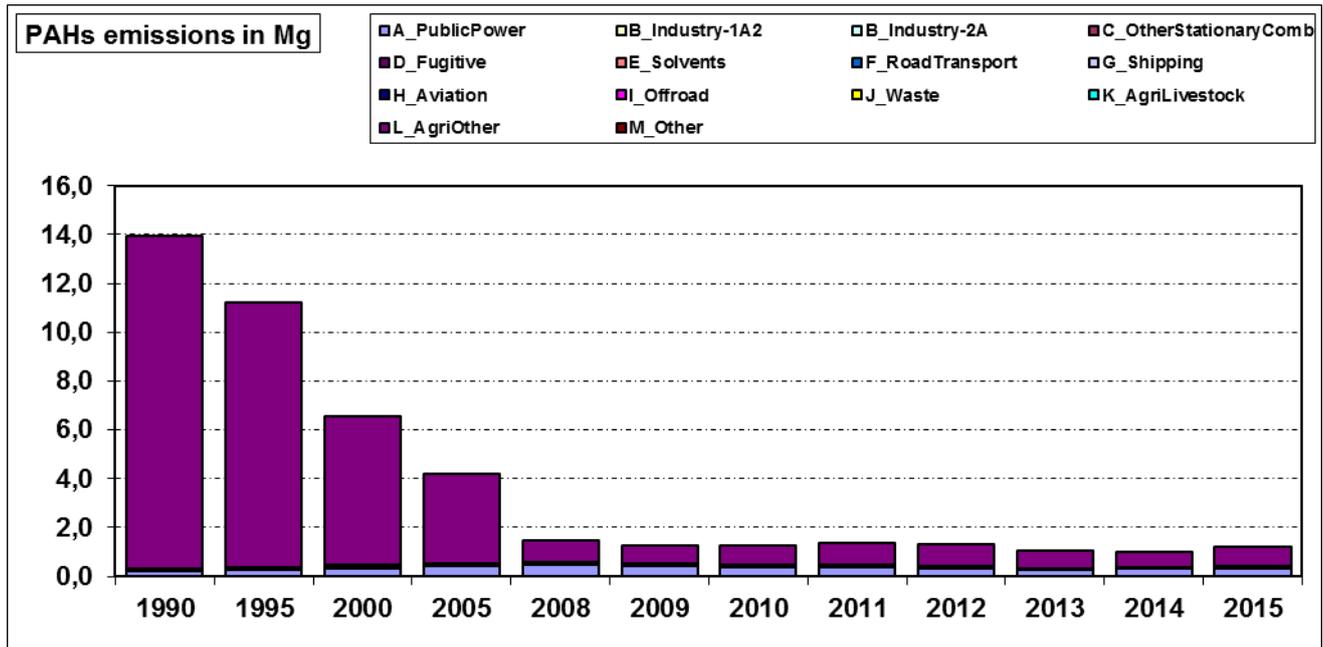


Figure 34: PAHs emissions trend 1990 – 2015.

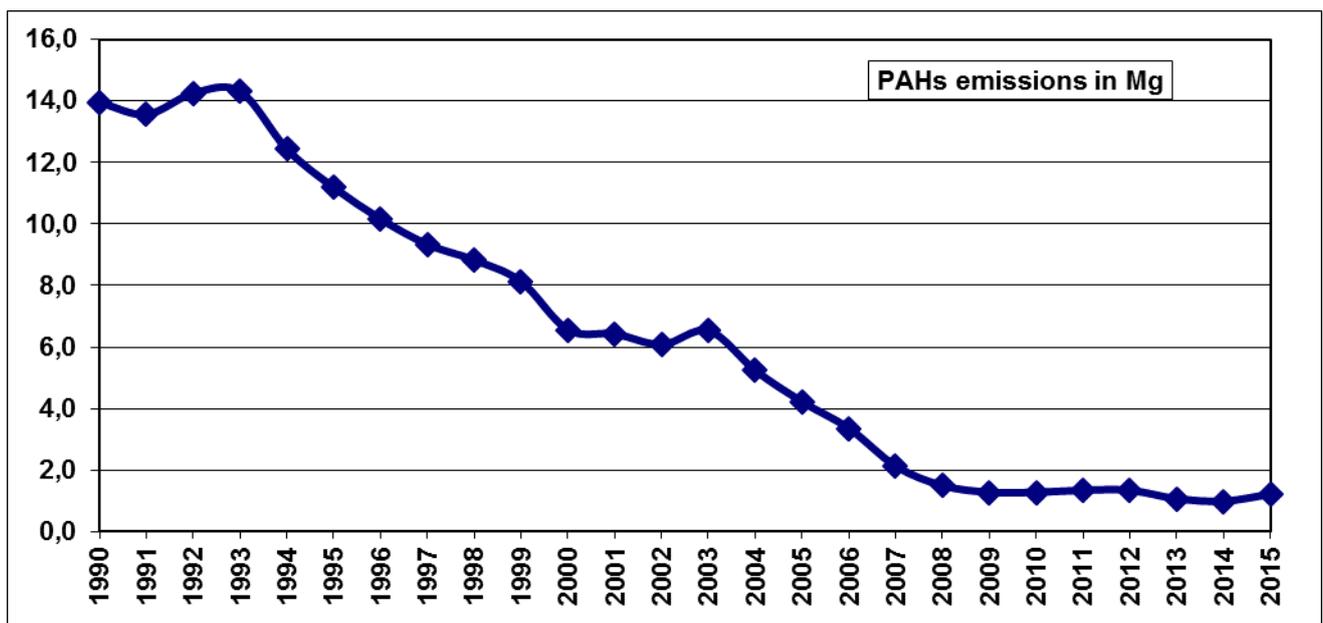


Figure 35: National total PAHs emissions for the period 1990 – 2015.

3.10 Trends for Hexachlorobenzene (HCB)

The Cyprus HCB emissions decreased by 0.04 kg in the 1990 – 2015 period, corresponding to 83% of the national total in 1990 and decreased by 0.05 Mg in the 2000 – 2015 period, corresponding to 85% of the national total in 2000 (**Figure 36-37**). This decrease is mainly due to the J_ Waste sector, where clinical waste incineration was terminated since 2003 and all clinical wastes are subjected to sterilization.

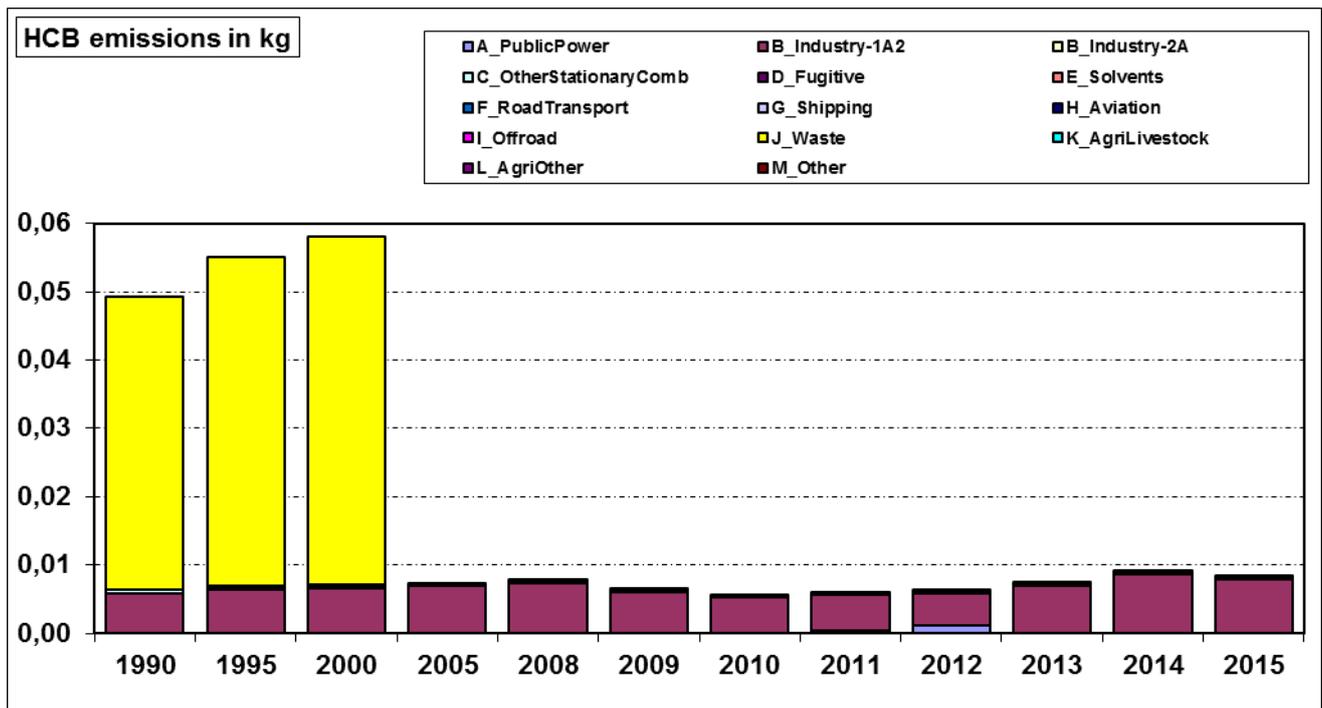


Figure 36: HCB emissions trend 1990 – 2015.

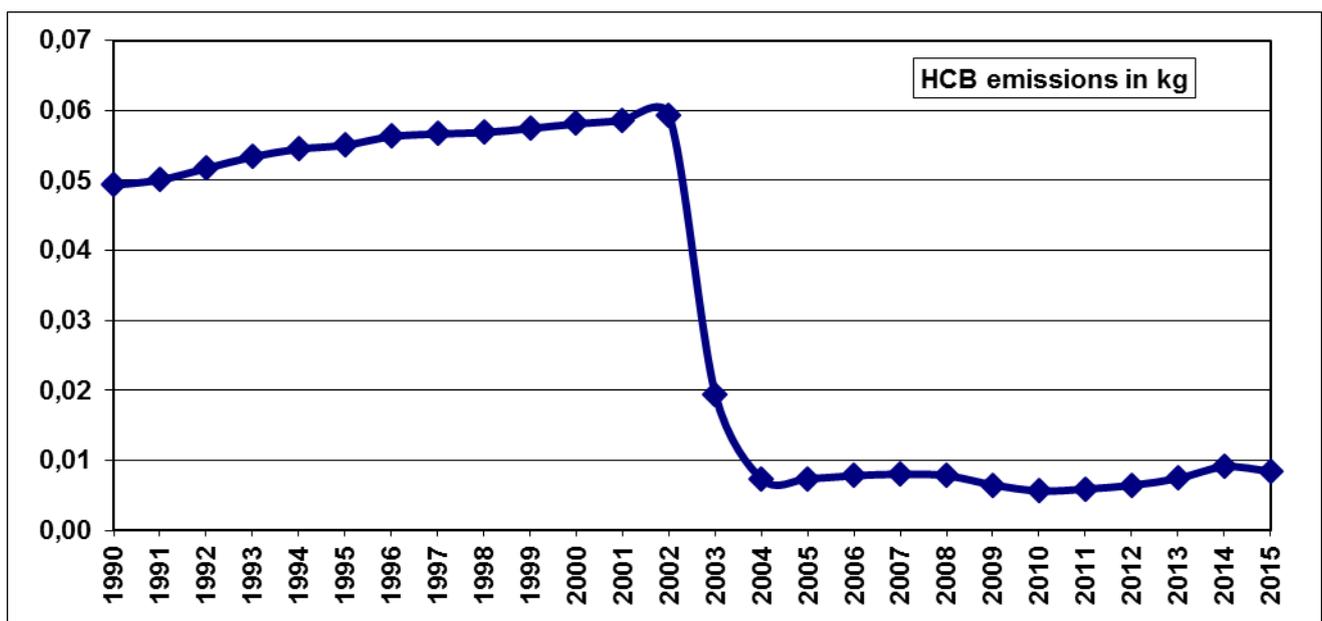


Figure 37: National total HCB emissions for the period 1990 – 2015.

4. A_Public Power

The A_Public Power sector is the major contributing sector to the Cyprus national emission inventory. The A_Public Power sector contributes by about 86% SO₂, 32% NO_x, 1% NMVOC, 17% PM₁₀, 3% CO, 49% Cd, 8% Hg and 22% PCDD/F to the national total of these pollutants.

The emission data from this sector are based on direct emission measurements (NO_x, CO and Particulates) or calculations based on fuel consumed and emission factors.

Emission estimations from direct emission measurements are calculated according to the following formula:

$$Emission (mg / year) = Flow\ rate (Nm^3 / h) * Operation\ hours (h / year) * Concentration (mg / Nm^3)$$

Concentration value is the yearly average.

Emission estimations based on fuel consumption and use of emission factors are calculated according to the following formula:

$$Emission (g / year) = Fuel\ Consumption (tn / year) * Emission\ Factor (g / tn)$$

The fuel consumption is derived from the Cyprus energy balance provided by the Energy Service. The emission factors used are derived from the EMEP/EEA Air Pollutant Emission Inventory Guidebook 2013 [9].

4.1. Energy industries

Public electricity and heat production (1A1a)

On July 11th 2011, a severe explosion that occurred within the military naval base “Evangellos Florakis” at the Southern coast of Cyprus, adjacent to the Vassilikos Power Station (PS), caused extensive damage to Vassilikos PS and as a result this power station was not in operation until late 2012. Vassilikos PS is the newest and largest power station of the island contributing approximately 50% to the generation system capacity. The Cyprus Energy Regulatory Authority (CERA) informed the Energy Commissioner and the Director General of the European Commission DG Energy about the sudden crisis in the energy market that Cyprus was facing.

The result of the severe reduction in generating capacity was that the Electricity Authority of Cyprus (EAC) was unable to meet the peak summer demand. The expected maximum demand for the summer 2011 was 1155 MW and the available generation capacity of the existing generating plants right after the incident was 689MW. Because of the damage of the plants at Vassilikos PS, temporary generating plants were immediately required and the old generating units of Moni PS and Dhekelia PS were returned to full use, until Vassilikos PS is fully restored.

Details concerning the situation of Public Electricity in Cyprus during 2011 – 2014 are shown in the Cyprus Informative Inventory Report 2013, March 2015 [6].

As far as the Renewable Energy Sources (RES) is concerned, the year 2010 can be regarded as a landmark year in the promotion of large scale Energy Projects from RES. Following the start of operation in the previous years, of small but important electricity generation units from Biogas, in 2010 important strides were made in the penetration of Wind and Solar Energy in the electricity system of Cyprus.

The first Wind Park was placed in operation in November 2010 at Orites locality, having 82MW installed capacity and consisting of 41 wind generators of 2,0 MW installed capacity each. Furthermore, additional Wind Farms was placed in operation in 2012. In the period under review three Wind Farms with total capacity of 146,7 MW were licenced.

Having in mind the already licensed electricity generation installations from RES and the prospective investments as well as the submitted timetables of the investors, it is believed that more projects will materialise and operate in the following years, if subject to the limitation of long procedures for obtaining the necessary approvals.

As mentioned above, in November 2010 the first Wind Park (82 MW) was placed in operation thus improving the generation mix to include renewable generation sources (wind, solar, animal waste etc) and eventually natural gas.

Details on electricity generation installations from RES in 2015 in comparison with 2013 and 2014 are given below in Table 26. [17].

Table 26: Electricity Generation Installation from RES

Technology	Installed Capacity in MW			Annual Energy Production in GWh		
	2013	2014	2015	2013	2014	2015
Wind Parks	146.7	146.7	157.5	230.6	182.4	226.3
Photovoltaic Systems	31.3	45.7	54.8	45.0	61.3	94.4
Biomass	8.4	9.0	9.7	35.8	37.5	36.6
Total Energy Production from RES (GWh)				311.4	281.2	357.3

Details for the above table could be found in the following link:

<http://www.cera.org.cy/el-gr/ilektrismos/1169/statistika-ape>

Currently Cyprus is mainly dependent on Heavy Fuel Oil and Diesel, which are 100% imported. In Cyprus, two power stations are in operation (Moni PS is a kind of standby unit). All the units of these stations burn liquid fuel (heavy fuel oil or diesel). Details of the units of these power stations are given in **Table 27**. It should be noted that Cyprus does not have waste incineration with energy recovery within this sector.

Table 27: Power Stations Operating in Cyprus.

Power Station	Units	Abatement Technology	Capacity (in MWe)	Fuel	Year of Operation
Moni (south coast)	Gas Turbine 1	None	37.5	Diesel	1992
	Gas Turbine 2	None	37.5	Diesel	1992
	Gas Turbine 3	None	37.5	Diesel	1995
	Gas Turbine 4	None	37.5	Diesel	1995
Dhekelia (south-east coast)	Steam Turbine 1	Low NOx tips	60	HFO	1982
	Steam Turbine 2	Low NOx tips	60	HFO	1983
	Steam Turbine 3	Low NOx tips	60	HFO	1989
	Steam Turbine 4	Low NOx tips	60	HFO	1989
	Steam Turbine 5	Low NOx burners	60	HFO	1993
	Steam Turbine 6	Low NOx burners	60	HFO	1993
	ICE 1	None	50	HFO	2009
	ICE 2	Selective Catalytic Reduction	50	HFO	2011
Vassilikos (south coast)	Steam Turbine 1 ¹	EP, Low NOx burners ²	130	HFO	2000
	Steam Turbine 2 ¹	EP, Low NOx burners ³	130	HFO	2000
	Steam Turbine 3 ¹	EP, Low NOx burners, FGD ⁴	130	HFO	2006
	CCGT 4 ¹	Water Injection for NOx reduction	220	Diesel	2009
	Temporary ICE ⁵	None	38	Diesel	2011
	CCGT 5	Water Injection for NOx reduction	220	Diesel	2012

Note: EP = Electrostatic Precipitators and FGD = Flue Gas Desulphurization

- 1.: Units were in operation until 11.7.2011.
- 2.: 1.1.2010 electrostatic precipitator (EP) and low NOx burners were installed.
- 3.: 1.6.2009 electrostatic precipitator (EP) and low NOx burners were installed.
- 4.: FGD was not in operation for the period 20.1.2010 - 31.12.2014.

It is noted that the Moni Power Station has almost stopped its operation. Last year the average operating hours for each turbine was approximately 180 hours per year.

In 2004, Cyprus was granted a derogation from Article 4(3) and part A of Annex III of Directive 2001/80/EC [8]. The derogation states that: "Emission limit values of 1700 mg/Nm³ shall apply to the boilers in operation at the combustion plants at Dhekelia and Vassilikos Power Stations until one of the following conditions materializes:

- there is an upgrade or a significant change to these boilers;
- natural gas becomes available on the island;
- Cyprus becomes an exporter of electricity;
- the currently operating boilers are closed.

As far as Moni Power Station is concerned, it falls under Article 4(4) of Directive 2001/80/EC [8] which means that the plant will not operate for more than 20000 operational hours for the period from 1 January 2008 to 31 December 2015.

Emission data are based on environmental annual reports submitted by the operator of the three power plants operating in Cyprus. Emission estimations until 2008, for all pollutants was carried out using activity data and emissions factors. From 2008 until today the missions estimations for NO_x, CO and particulates (PM_{2.5}, PM₁₀ and TSP) result from continuous emission monitoring systems (**Tier 3 methodology**).

SO_x emissions are estimated based on the sulphur content of fuels used in each unit. The trend of the average sulphur content of fuels used in energy production in Cyprus during the 1990 – 2014 period are presented in **Table 28**.

Table 28: Sulphur Content (%) of Fuels used per year in NFR 1A1a.

Year	Fuel	Units	Sulphur Content (%)
1990 - 1999	Heavy Fuel Oil	Steam Turbines	2
	Diesel	Gas Turbines	0.3
2000 - 2003	Heavy Fuel Oil	Steam Turbines – Dhekelia, Moni	2
	Heavy Fuel Oil	Steam Turbines – Vassilikos	1
	Diesel	Gas Turbines	0.3
2004	Heavy Fuel Oil	Steam Turbines – Moni	1.98
	Heavy Fuel Oil	Steam Turbines – Dhekelia	1.91
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.7
	Diesel	Gas Turbines	0.2
2005	Heavy Fuel Oil	Steam Turbines – Moni	2.08
	Heavy Fuel Oil	Steam Turbines – Dhekelia	2
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.7
	Diesel	Gas Turbines	0.2
2006	Heavy Fuel Oil	Steam Turbines – Moni	1.68
	Heavy Fuel Oil	Steam Turbines – Dhekelia	1.65
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.61
	Diesel	Gas Turbines	0.2
2007	Heavy Fuel Oil	Steam Turbines – Moni	1.65
	Heavy Fuel Oil	Steam Turbines – Dhekelia	1.54
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.65
	Diesel	Gas Turbines	0.2
2008	Heavy Fuel Oil	Steam Turbines – Moni	1.01
	Heavy Fuel Oil	Steam Turbines – Dhekelia	0.98
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.87
	Diesel	Gas Turbines	0.1
2009	Heavy Fuel Oil	Steam Turbines – Moni	0.84
	Heavy Fuel Oil	Steam Turbines – Dhekelia	0.82
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.8
	Diesel	Gas Turbines	0.1
2010	Heavy Fuel Oil	Steam Turbines – Moni	0.9
	Heavy Fuel Oil	Steam Turbines, ICE – Dhekelia	0.94
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.97
	Diesel	Gas Turbines	0.1
2011	Heavy Fuel Oil	Steam Turbines – Moni	0.91
	Heavy Fuel Oil	Steam Turbines, ICE – Dhekelia	0.93
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.86
	Diesel	Gas Turbines, Temporary ICE	0.065

Year	Fuel	Units	Sulphur Content (%)
2012	Heavy Fuel Oil	Steam Turbines – Moni	0.71
	Heavy Fuel Oil	Steam Turbines, ICE – Dhekelia	0.82
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0
	Diesel	Gas Turbines, Temporary ICE	0.073
2013	Diesel	Gas Turbines – Moni	0.087
	Heavy Fuel Oil	Steam Turbines, ICE – Dhekelia	0.89
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.92
2014	Diesel	Gas Turbines – Moni	0.086
	Heavy Fuel Oil	Steam Turbines, ICE – Dhekelia	0.95
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.92
2015	Diesel	Gas Turbines – Moni	0.092
	Heavy Fuel Oil	Steam Turbines, ICE – Dhekelia	0.78
	Heavy Fuel Oil	Steam Turbines – Vassilikos	0.82

The values of sulphur contents are given by the Electricity Authority. They analyze every purchased batch of heavy fuel oil and submit to us the results. The values which are given in the **Table 28** are the yearly averages.

For the emission estimations of other air pollutants, emission factors were used. In **Table 29** the corresponding emission factors used are given. Emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook 2013 [9].

Table 29: EFs used in NFR 1A1a.

Pollutants	Units	Emission factors
NMVOC	Steam Turbines	2.3 g/GJ
	Gas Turbines, CCGT	0.19 g/GJ
	ICE	37.1 g/GJ
BC	Steam Turbines	5.6% of PM _{2.5}
	Gas Turbines, CCGT	33.5% of PM _{2.5}
	ICE	78% of PM _{2.5}
Pb	Steam Turbines	4.56 mg/GJ
	Gas Turbines, CCGT	0.0069 mg/GJ
	ICE	4.07 mg/GJ
Cd	Steam Turbines	1.2 mg/GJ
	Gas Turbines, CCGT	0.0012 mg/GJ
	ICE	1.36 mg/GJ
Hg	Steam Turbines	0.341 mg/GJ
	Gas Turbines, CCGT	0.53 mg/GJ
	ICE	1.36 mg/GJ
As	Steam Turbines	3.98 mg/GJ
	Gas Turbines, CCGT	0.0023 mg/GJ
	ICE	1.81 mg/GJ
Cr	Steam Turbines	2.55 mg/GJ
	Gas Turbines, CCGT	0.28 mg/GJ

Pollutants	Units	Emission factors
Cr	ICE	1.36 mg/GJ
Cu	Steam Turbines	5.31 mg/GJ
	Gas Turbines, CCGT	0.17 mg/GJ
	ICE	2.72 mg/GJ
Ni	Steam Turbines	255 mg/GJ
	Gas Turbines, CCGT	0.0023 mg/GJ
	ICE	1.36 mg/GJ
Se	Steam Turbines	2.06 mg/GJ
	Gas Turbines, CCGT	0.0023 mg/GJ
	ICE	6.79 mg/GJ
Zn	Steam Turbines	87.8 mg/GJ
	Gas Turbines, CCGT	0.44 mg/GJ
	ICE	1.81 mg/GJ
PCDD/F	Steam Turbines	2.5 ng I-TEQ/TJ
	ICE	0.99 ng I-TEQ/TJ
Benzo(a)pyrene	ICE	0.116 mg/GJ
Benzo(b)fluoranthene	ICE	0.502 mg/GJ
Benzo(k)fluoranthene	ICE	0.0987 mg/GJ
Indeno (1,2,3-cd) pyrene	Steam Turbines	6.92 µg/GJ
	ICE	0.187 mg/GJ

Category 1A1a is a key source for the following components (% of national total in 2015):

NO _x	32.02%
SO _x	86.35%
PM _{2.5}	19.58%
PM ₁₀	17.11%
TSP	16.45%
BC	4.05%
Cd	48.78%
Hg	8.05%
PCDD/F	22.09%

5. I_Offroad

Mobile Combustion in Manufacturing Industries: Other (1A2gvii)

No key sources are found in this category.

Agriculture/forestry/fishing: Off road vehicles and other machinery (1A4cii)

Emissions from NFR category 1A4cii were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook 2013 [9]. Off road vehicles and other machinery emissions from agriculture are estimated based on fuel combustion obtained from the Energy Service and emission factors (Table 30). The major fuel used in this category is diesel. Diesel consumption under this category is given in Table 31. No key sources are found in this category.

The estimation of emissions in this sector shows several jumps and dips in the Cyprus Emission Inventory reporting round 2012 and the ERT experts recommended for improvement in the Stage 3 review report [12]. These inconsistencies were due to the activity data used for the estimation of the emissions. The activity data have been corrected and recalculations were made.

Table 30: EFs used in NFR 1A4cii.

Pollutant	Emission Factor
NO _x	35043 g/tn fuel
NMVOC	3366 g/tn fuel
NH ₃	8 g/tn fuel
TSP	1738 g/tn fuel
PM ₁₀	1738 g/tn fuel
PM _{2.5}	1738 g/tn fuel
CO	10939 g/tn fuel
Cd	0.01 mg/kg fuel
Cr	0.05 mg/kg fuel
Cu	1.7 mg/kg fuel
Ni	0.07 mg/kg fuel
Se	0.01 mg/kg fuel
Zn	1 mg/kg fuel
Benzo(a)pyrene	30 µg/kg fuel
Benzo(b)fluoranthene	50 µg/kg fuel

Table 31: Diesel consumption from NFR 1A4cii.

Year	Diesel consumption In tones	Year	Diesel consumption in tones
1990	6155	2003	10862
1991	6619	2004	8972
1992	7984	2005	8916
1993	8114	2006	8850
1994	9224	2007	9175
1995	8769	2008	8909
1996	9204	2009	7980
1997	9659	2010	7870
1998	10194	2011	8136
1999	10563	2012	7806
2000	10815	2013	7687
2001	10920	2014	7072
2002	11342	2015	7799

Agriculture/forestry/fishing: National fishing (1A4ciii)

Emissions from NFR category (1A4ciii) were calculated based on TREMOVE methodology. Number of fishing boats was used as activity data. Emission factors consists of a weighted average of the emission of the main engine (ME) plus the emission of the auxiliary engine (AE) taking into account engine types and fuel types used by the main engine and the auxiliary engines. Average engine using time and engine load have been taken into account.

No key sources are found in this category.

The total number of fishing boats for the years 2000-2015 is shown in **Table 32**.

Other Mobile (including military land-based and recreational boat) (1A5b)

Emissions from NFR category (1A5b) were calculated based on TREMOVE methodology. Number of military boats was used as activity data. Emission factors consists of a weighted average of the emission of the main engine (ME) plus the emission of the auxiliary engine (AE) taking into account engine types and fuel types used by the main engine and the auxiliary engines. Average engine using time and engine load have been taken into account.

No key sources are found in this category.

The total number of military boats for the years 2000-2015 is shown in **Table 32**.

Table 32: Number of Fishing and Military Boats.

Year	Fishing Boats	Military Boats
2000	34	35
2001	46	27
2002	45	26
2003	60	23
2004	65	18
2005	50	23
2006	66	428
2007	65	722
2008	57	435
2009	40	321
2010	38	218
2011	60	250
2012	64	246
2013	36	302
2014	29	371
2015	22	206

6. H_Aviation, F_Road transport and G_Shipping

6.1. H_Aviation

Civil Aviation (1A3a)

In Cyprus there are two international airports. These airports are not interconnected with internal flights, so there is no domestic aviation activity in Cyprus. However, smaller aircrafts activity is included in the NFR category 1A3aii(i): Civil Aviation (Domestic, LTO).

Emissions from international airport traffic (1A3ai(i): International aviation (LTO)) was calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. Emission factors used are given in **Table 33**. Number of LTOs per aircraft type was used for the calculations.

Emissions from the NFR sector 1A3aii(i): Civil Aviation (Domestic, LTO) was calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. Emission factors used are given in **Table 34**. The emission factors derived using the emission factors of the aircraft type BAe146 which are divided by a factor of 2 based on the engine power of these aircrafts. Number of LTOs per aircraft type was used for the calculations.

Table 33: EFs used in NFR 1A3ai.

Aircraft Type	EFs (kg/LTO)				
	NO _x	NM _{VOC}	SO ₂	PM _{2.5} , PM ₁₀	CO
A310	23.20	5.00	1.50	0.14	25.80
A320	10.80	1.70	0.80	0.09	17.60
A330	36.10	1.90	2.20	0.19	21.50
A340	35.40	16.90	2.00	0.21	50.60
BAC1-11	4.90	19.30	0.70	0.17	37.70
BAe146	4.20	0.90	0.60	0.08	9.70
B727	12.60	6.50	1.40	0.22	26.40
B737 100	8.00	0.50	0.90	0.10	4.80
B737 400	8.30	0.60	0.80	0.07	11.80
B747 100-300	55.90	33.60	3.40	0.47	78.20
B747 400	55.60	1.60	3.40	0.32	19.50
B757	19.70	1.10	1.30	0.13	12.50
B767 300 ER	26.00	0.80	1.60	0.15	6.10
B777	53.60	20.50	2.60	0.20	61.40
DC9	7.30	0.70	0.90	0.16	5.40
DC10	41.70	20.50	2.40	0.32	61.60
F28	5.20	29.60	0.70	0.15	32.70
F100	5.80	1.30	0.70	0.14	13.70
MD82	12.30	1.40	1.00	0.12	6.50

Table 34: EFs used in NFR 1A3aii(i).

Aircraft Type	EFs (kg/LTO)				
	NO _x	NM _{VOC}	SO ₂	PM _{2.5} , PM ₁₀	CO
Smaller Aircraft	2.1	0.45	0.3	0.04	4.85

No key sources are found in these categories.

6.2. *F_RoadTransport*

Road Transportation (1A3b)

Road transport emissions are estimated by the use of COPERT 5 (Tier 3 methodology). COPERT 5 is a MS Windows software program. In principle, COPERT 5 has been developed for use by the National Experts in order to estimate emissions from road transport which will be included in official annual national inventories. The use of a software tool to calculate road transport emissions allows for a transparent and standardized, hence consistent and comparable data collecting and emissions reporting procedure, in accordance with the requirements of international conventions and protocols and EU legislation.

The COPERT 5 methodology is part of the EMEP/CORINAIR Emission Inventory Guidebook [9]. The Guidebook, developed by the UNECE Task Force on Emissions Inventories and Projections, is intended to support reporting under the UNECE Convention on Long-Range Transboundary Air Pollution and the EU directive on national emission ceilings.

COPERT 5 estimates emissions of all major air pollutants (CO, NO_x, VOC, particulates, NH₃, SO₂, heavy metals) produced by different vehicle categories (passenger cars, light duty vehicles, heavy duty vehicles, mopeds and motorcycles). Emissions estimated are distinguished in three sources:

- Emissions produced during thermally stabilized engine operation (hot emissions),
- emissions occurring during engine start from ambient temperature (cold-start and warming-up effects) and
- NM_{VOC} emissions due to fuel evaporation.

Non-exhaust particulate emissions from tyre and brake wear are also included. The total emissions are calculated as a product of activity data provided by the user and speed-dependent emission factors calculated by the software.

In addition, the fuel consumed in this sector is taken into consideration. The COPERT 5 run estimates the fuel consumption (diesel and gasoline). These values are then compared to statistical fuel sold and the annual mileage values are corrected on the basis of the differences between calculated and statistical fuel consumption. A new COPERT run is performed with the adjusted data and all emissions are calculated.

In 2015 submission, emissions from this sector have been calculated with COPERT 5, whereas COPERT 4 had been used for the previous inventory submissions.

The total number of road vehicles by type is shown in **Table 35** and the corresponding trend is shown in **Figure 38**. The decrease of the vehicles numbers shown in the years 2014 and 2015 is due to the financial crisis occurred in Cyprus and the increased usage of the public transportation.

Table 35: Number of vehicles by type.

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Passenger cars	194893	243392	302096	416758	530167	543187	545238	545234	476386	485248
Light Duty Vehicles	69708	99152	116672	125602	125019	124301	120729	119563	93377	92721
Heavy Duty Vehicles	13836	15246	16930	20091	20399	20448	20260	18053	11988	12184
Mopeds-Motorcycles	64456	67361	59326	61738	57311	56155	55066	54269	40917	39215

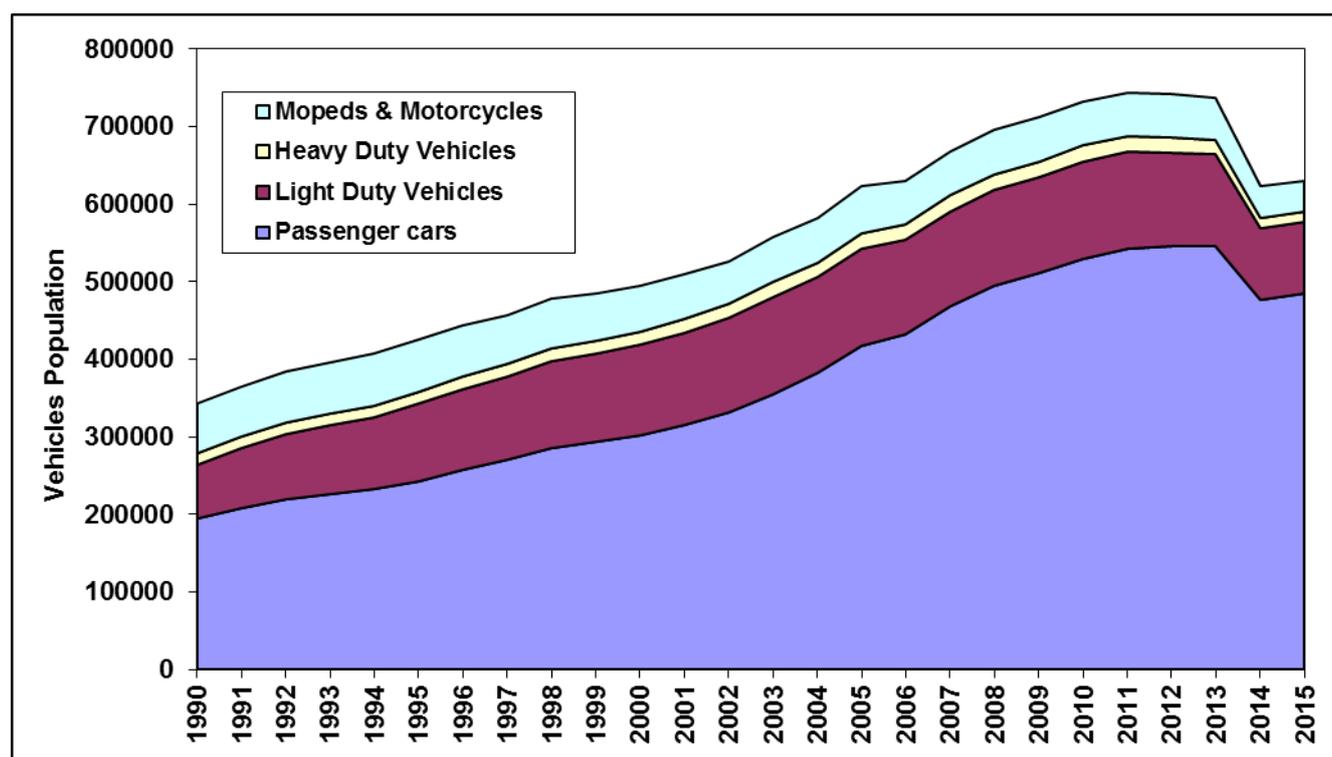


Figure 38: Trend of vehicles population in the F_Road transport sector.

1A3bi Road Transport; Passenger cars

Category 1A3bi is a key source for the following components (% of national total in 2015):

NO _x	8.48%
NMVOG	9.27%
BC	13.19%
CO	46.83%
Pb	56.58%
Cd	8.01%
PCDD/PCDF	22.08%

1A3bii Road Transport; Light duty vehicles

Category 1A3bii is a key source for the following components (% of national total in 2015):

NO _x	8.41%
PM _{2.5}	11.42%
PM ₁₀	6.65%
TSP	4.80%
BC	28.04%
CO	8.14%
Pb	19.61%
PCDD/PCDF	15.15%

1A3biii Road Transport; Heavy duty vehicles

Category 1A3biii is a key source for the following components (% of national total in 2015):

NO _x	19.45%
PM _{2.5}	7.78%
PM ₁₀	4.53%
TSP	3.27%
BC	17.40%
Pb	21.07%

1A3biv Road Transport; Mopeds and motorcycles

Category 1A3biv is a key source for the following components (% of national total in 2015):

NMVOG	5.41%
CO	9.67%

1A3bv Road Transport; Gasoline evaporation

Category 1A3bv is a key source for the following components (% of national total in 2015):

NMVOG	15.94%
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1A3bvi Road Transport; Automobile tyre and brake wear

Category 1A3bvi is a key source for the following components (% of national total in 2015):

PM _{2.5}	8.13%
PM ₁₀	8.86%
TSP	8.39%

As shown above, the road transport sector (NFR 1A3b) is a key source sector in the Cyprus national emission inventory for many of the pollutants covered under the LRTAP convention. In **Figure 39** below the trend of NO_x, NMVOG, SO₂, TSP, CO and PCDD/PCDF are shown for the years 1990, 2000 and 2015.

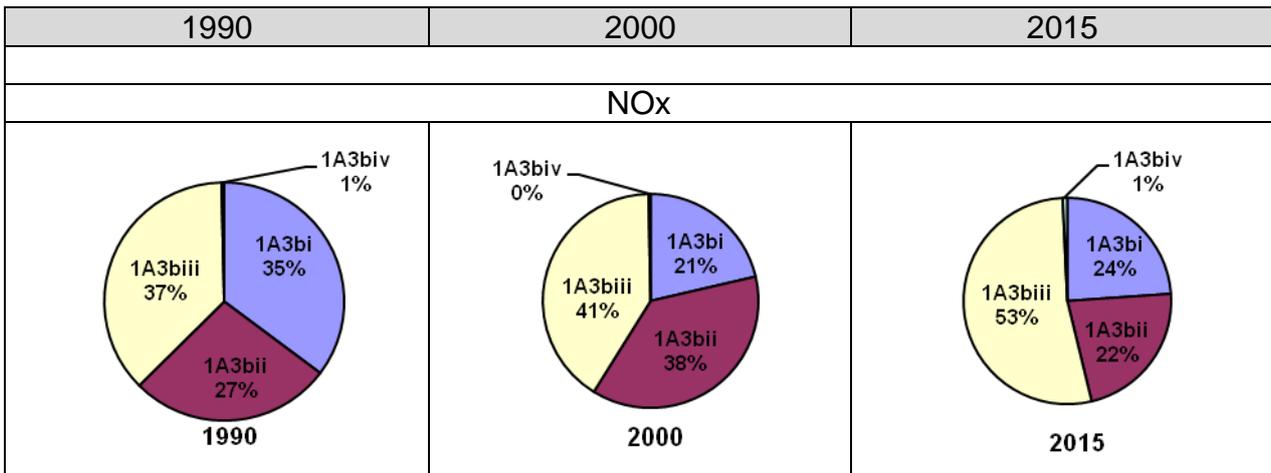


Figure 39(i). NOx emissions trend

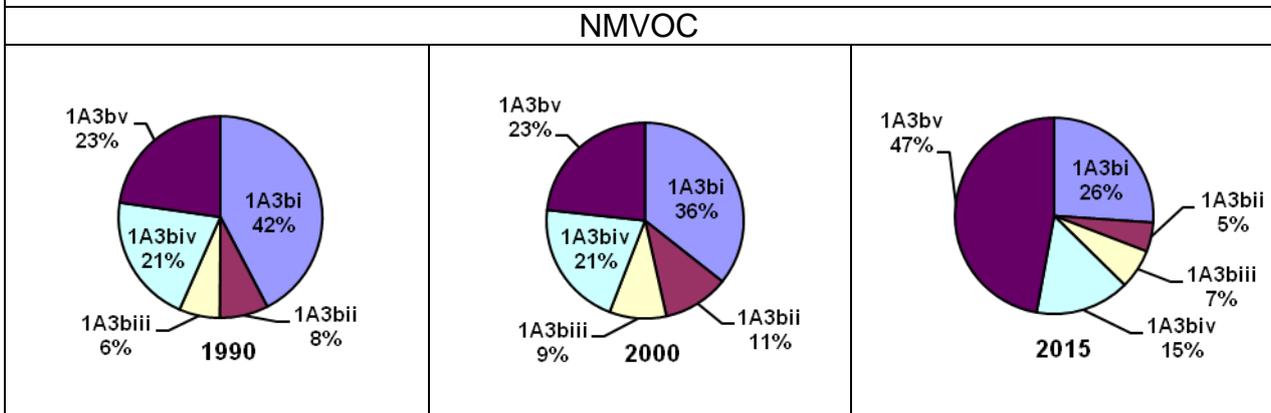


Figure 39(ii). NMVOC emissions trend

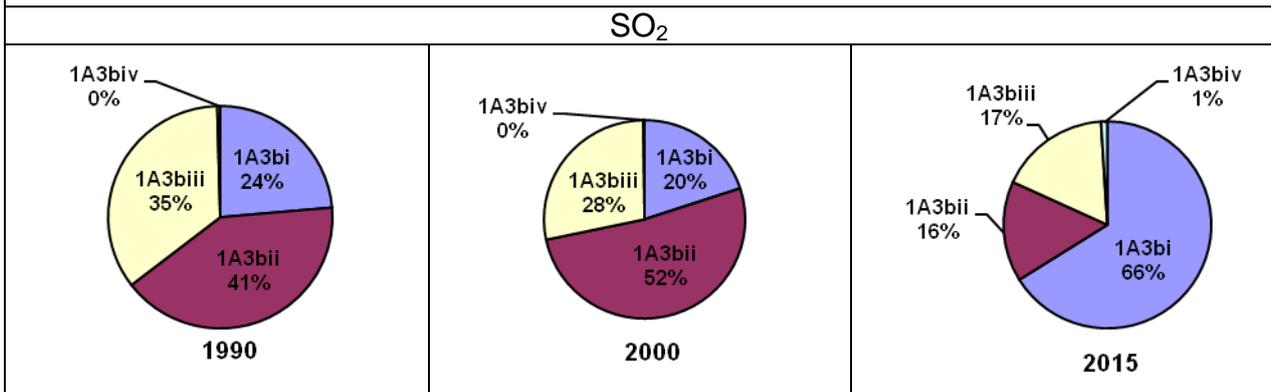


Figure 39(iii). SO₂ emissions trend

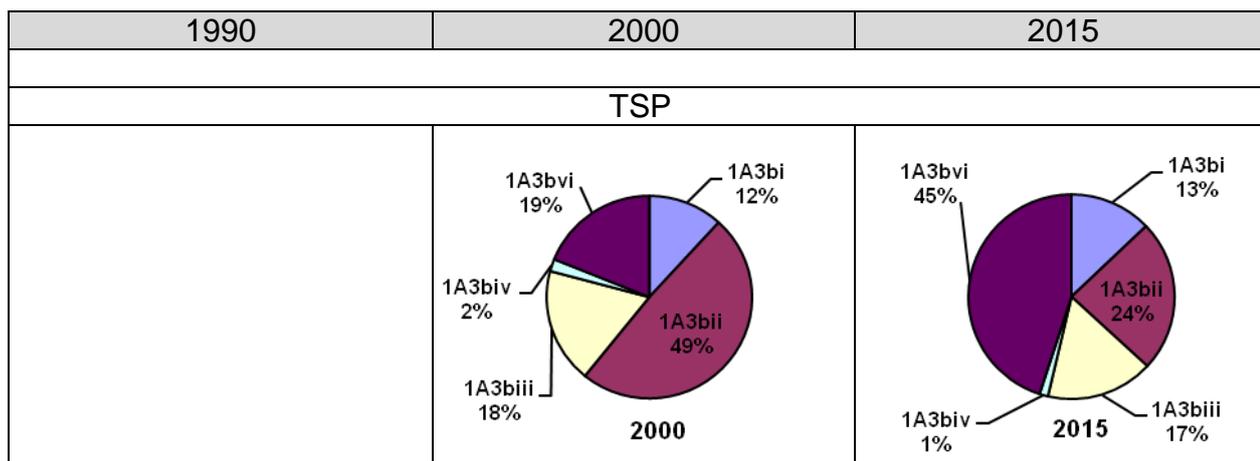


Figure 39(iv). TSP emissions trend

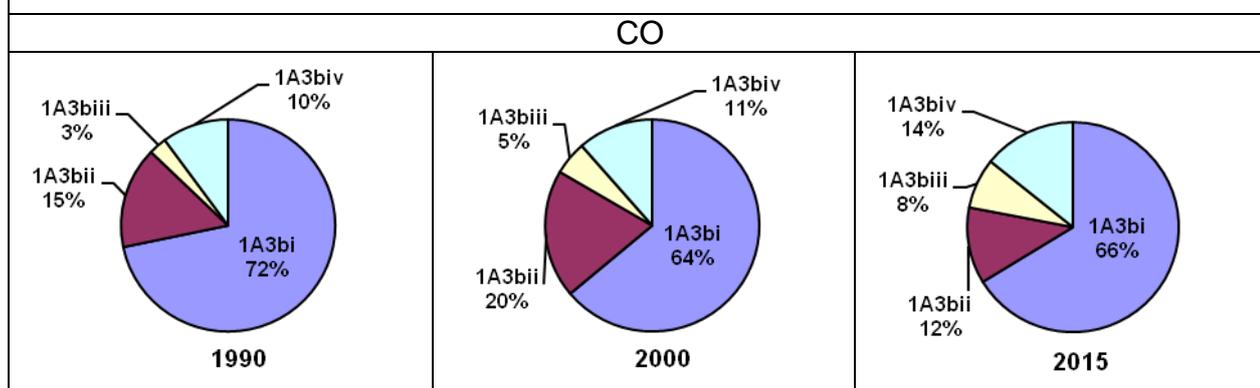


Figure 39(v). CO emissions trend

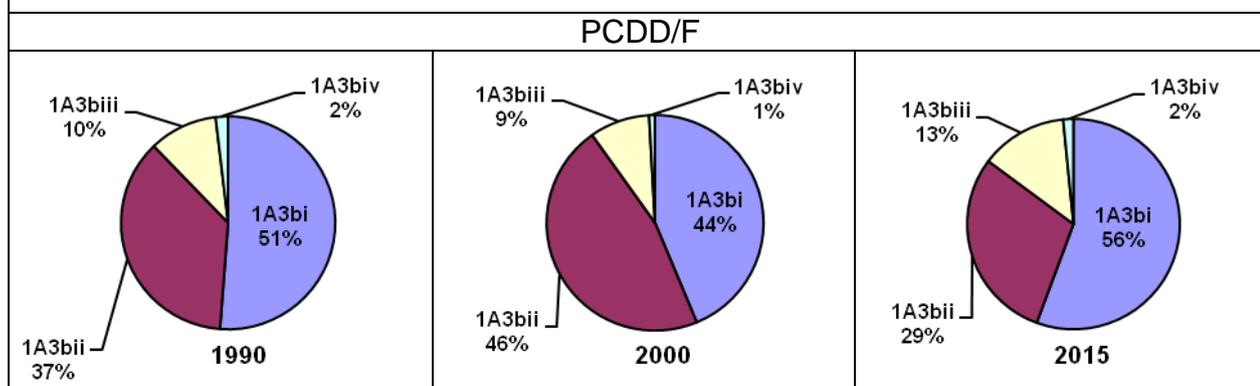


Figure 39(vi). PCDD/F emissions trend

Figure 39: Emissions trend in the road transport sector.

Railways (1A3c)

No such activity takes place in Cyprus.

6.3. G_Shipping

Navigation (1A3d)

For the estimation of emissions from the International navigation (1A3di) sector, only in-port emissions were taken into account. Port callings for various passenger ferries and cargo vessels were used as activity data for the calculations based on the REMOVE methodology. The emission factor consists of a weighted average of the emission of the main engine (ME) plus the emission of the auxiliary engine (AE) taking into account engine types and fuel types used by the main and the auxiliary engines. Average engine using time and engine load have been taken into account. No key sources are found in this category. This category is not included in the national total (memo items).

In Cyprus there are no inland waterways. Thus, the NFR category 1A3dii: National Navigation (shipping) includes emissions from yachts and small boats. The emissions calculation is based on the same methodology (REMOVE methodology) as described above.

No key sources are found in this category.

The total number of ships entered into Cyprus ports in 2000, 2005, 2010, 2011, 2012, 2013, 2014 and 2015 by category is shown in **Table 36**.

Table 36: Number of Ships by Category

Ship Category	2000	2005	2010	2011	2012	2013	2014	2015
Passenger Carriers	1212	482	382	288	247	249	207	162
Cargo ships: Conventional & Reefer	1382	1240	755	637	507	491	392	359
Cargo ships: Container & Cont/Multipurpose	879	978	961	957	892	854	767	742
Cargo ships: Ro-Ro & Vehicle Carriers	593	649	461	352	256	232	231	264
Cargo ships: Bulk Carriers	116	291	248	278	339	426	522	549
Cargo ships: Tankers	859	995	792	793	778	775	655	805
Other cargo ships	4	16	9	16	17	14	112	14
Yacht	58	54	112	65	71	94	52	47
Other (small boats)	118	206	457	590	726	1061	853	792
Total	5221	4911	4177	3976	3833	4196	3791	3734

Pipeline transport (1A3ei)

No such activity takes place in Cyprus.

7. C_Other Stationary Combustion

7.1. Commercial/Institutional (1A4ai and 1A4aii)

Emissions from categories Commercial/Institutional: Stationary (1A4ai) and Commercial/Institutional: Mobile (1A4aii) are reported as Included Elsewhere (IE). This is due to the fact that the amount of fuel consumed under each of these categories cannot be identified. Thus, emissions from category Commercial / Institutional: Stationary (1A4ai) are included in category Residential stationary plants (1A4bi) and emissions from category Commercial / Institutional: Mobile (1A4aii) are included in category F_Road transport (1A3bi-iv).

7.2. Residential: Stationary plants (1A4bi)

Emissions from Residential: Stationary plants (1A4bi) were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. Combustion emissions from central heating are based on fuel consumption data (Cyprus energy balance - Annex 6) and emission factors (Table 37). The major fuel used in this category is diesel. Wood is also used as a fuel in fireplaces for heating. Activity data on wood were derived from the annual Statistical Service reports. The activity data used under this category are given in Table 38.

The estimation of emissions in this sector shows several jumps and dips in the Cyprus Emission Inventory reporting round 2011 and recommendations for improvement were written in the Stage 3 review report [12]. These inconsistencies were due to the activity data used for the estimation of the emissions. The activity data have been corrected and recalculations were made.

Table 37: EFs used in NFR 1A4bi.

Pollutants	Emission Factors	
	Diesel	Wood
NO _x	51 g/GJ	80 g/GJ
NMVOG	0.69 g/GJ	600 g/GJ
SO _x	sulphur content 1%	11 g/GJ
NH ₃	NE	70 g/GJ
TSP	1.9 g/GJ	800 g/GJ
PM ₁₀	1.9 g/GJ	760 g/GJ
PM _{2.5}	1.9 g/GJ	740 g/GJ
BC	8.5% of PM _{2.5}	10% of PM _{2.5}
CO	57 g/GJ	4000 g/GJ
Pb	0.012 mg/GJ	27 mg/GJ
Cd	0.001 mg/GJ	13 mg/GJ
Hg	0.12 mg/GJ	0.56 mg/GJ
As	0.002 mg/GJ	0.19 mg/GJ
Cr	0.2 mg/GJ	23 mg/GJ
Cu	0.13 mg/GJ	6 mg/GJ
Ni	0.005 mg/GJ	2 mg/GJ
Se	0.002 mg/GJ	0.5 mg/GJ
Zn	0.42 mg/GJ	512 mg/GJ

Pollutants	Emission Factors	
	Diesel	Wood
PCDD/F	5.9 ng I-TEQ/GJ	800 ng I-TEQ/GJ
Benzo(a)pyrene	0.08 mg/GJ	121 mg/GJ
Benzo(b)fluoranthene	0.04 mg/GJ	111 mg/GJ
Benzo(k)fluorathene	0.07 mg/GJ	42 mg/GJ
Indeno(1.2.3-cd)pyrene	0.16 mg/GJ	71 mg/GJ
HCB	NA	5 µg/GJ
PCBs	NA	0.06 mg/GJ

Table 38: Fuels consumption from NFR 1A4bi.

Year	Biomass (wood in fireplaces) in tones	Diesel (residential heating) in tones
1990	6165	70788
1991	5033	76117
1992	4727	91819
1993	5956	93314
1994	4511	106074
1995	4680	100846
1996	4256	105849
1997	4105	111075
1998	3558	117236
1999	3450	121475
2000	2893	124375
2001	3445	125582
2002	2794	130431
2003	2338	124917
2004	1866	117605
2005	2131	127486
2006	1759	127376
2007	2117	108590
2008	1650	110018
2009	2287	99831
2010	1981	84818
2011	1824	91944
2012	4727	88417
2013	3941	76026
2014	3344	64116
2015	5376	74662

Category 1A4bi is a key source for the following components (% of national total in 2015):

PM _{2.5}	6.94%
PM ₁₀	4.14%
TSP	3.13%
PCDD/PCDF	22.08%

7.3. Residential: Household and gardening (mobile) (1A4bii)

Combustion emissions from household and gardening activities (mobile) are reported as Included Elsewhere (IE). This is due to fact that the fuel consumed under this category cannot be identified from the fuel used in agriculture (off-road vehicles and other machinery). Thus, emissions from this category are included in category Agriculture/forestry/fishing: Off-road vehicles and other machinery (1A4cii).

7.4. Agriculture/forestry/fishing: Stationary (1A4ci)

Emissions from NFR category 1A4ci were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. Stationary combustion emissions from agriculture are estimated based on fuel combustion obtained from the Energy Service and emission factors (**Table 39**). The major fuel used in this category is diesel. Diesel consumption under this category is given in **Table 40**.

No key sources are found in this category.

The estimation of emissions in this sector shows several jumps and dips in the Cyprus During the Stage 3 review of the Emission Inventory reporting round 2012, the ERT experts suggested to investigate the reasons for these jumps and dips. The national experts after investigation concluded that these inconsistencies were due to the fact that the activity data were used for the estimation of the emissions were wrong. The activity data were corrected and recalculations were made.

Table 39: EFs used in NFR 1A4ci.

Pollutant	Emission Factor
NO _x	513 g/GJ
NMVOC	25 g/GJ
SO _x	sulphur content 1%
NH ₃	NE
TSP	20 g/GJ
PM ₁₀	20 g/GJ
PM _{2.5}	20 g/GJ
BC	56% of PM _{2.5}
CO	66 g/GJ
Pb	0.08 mg/GJ
Cd	0.006 mg/GJ
Hg	0.12 mg/GJ

Pollutant	Emission Factor
As	0.03 mg/GJ
Cr	0.2 mg/GJ
Cu	0.22 mg/GJ
Ni	0.008 mg/GJ
Zn	29 mg/GJ
PCDD/F	1.4 ng I-TEQ/GJ
Benzo(a)pyrene	1.9 mg/GJ
Benzo(b)fluoranthene	15 mg/GJ
Benzo(k)fluorathene	1.7 mg/GJ
Indeno(1,2,3-cd)pyrene	1.5 mg/GJ

Table 40: Diesel consumption from NFR 1A4ci.

Year	Diesel consumption In tones	Year	Diesel consumption in tones
1990	12311	2003	21725
1991	13238	2004	18944
1992	15969	2005	19682
1993	16229	2006	20075
1994	18448	2007	18397
1995	17538	2008	17783
1996	18408	2009	15959
1997	19317	2010	15739
1998	20389	2011	16271
1999	21126	2012	15611
2000	21630	2013	15375
2001	21840	2014	14145
2002	22684	2015	15598

7.5. Other Stationary (including military) (1A5a)

Emissions from category Other Stationary (including military) (1A5a) are reported as Included Elsewhere (IE). This is due to the fact that the amount of fuel consumed under this category cannot be identified. Thus, emissions from this category are included in categories Residential: stationary plants (1A4bi) and Agricultural/forestry/fishing: stationary (1A4ci).

8. D_Fugitive

8.1. Solid Fuels (1B1a-c)

In Cyprus there is no mining and handling of solid fuels. This category is reported as NO (Not Occurring).

8.2. Exploration, Production, Transport (1B2ai)

In Cyprus there are no first treatment oil facilities. This category is reported as NO (Not Occurring).

8.3. Refining/Storage (1B2aiv)

A petroleum refinery was in operation in Cyprus until its termination in March 2004. Since then, all fuels consumed in Cyprus are imported. Since 2005 this category is reported as NO (Not Occurring).

Emissions from this NFR category until 2004 were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. NMVOC emissions from refining and storage were estimated based on crude oil treated in the refinery. Crude oil consumption was obtained from the national energy balance. NMVOC emission factor used is 0.2 kg/Mg crude oil.

8.4. Distribution of Oil Products (1B2av)

Emissions from NFR category 1B2av were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. NMVOC emissions are estimated based on fuel stored and distributed in Cyprus. The quantity of fuel was obtained from the national energy balance. The emission factors used are shown in **Table 41**.

In Cyprus, only storage and distribution of petroleum oil products takes place. All fuels used are imported, stored and distributed all over the island. The oil companies are operating Vapour Recovery Units (VRUs) for the control of NMVOC emissions from petrol. Two VRUs have been installed since 2006. In addition, all road tankers have been modified as required to maintain petrol vapours and all petrol stations have installed the necessary equipment for vapour collection (Stage I vapour recovery). Until the end of 2015, approximately 39% of the existing petrol stations installed the necessary equipment and were upgraded to Stage II.

Table 41: EFs used in NFR 1B2av.

Activity	Technologies/Practices	NMVOC EFs (g/m ³ throughput/kPa TVP)
Transport and Depots and Border Terminals	Road Tanker, Bottom Loading	9
	Road Tanker, Top Loading	9
	Road Tanker, Bottom or Top Loading	23
	Vertical Fixed Roof Tanks	0.06 kg/Mg gasoline handled
Service Stations (including re-fuelling of cars)	Storage Tank-Filling with Stage 1b in operation	1.2
	Storage Tank-Breathing	3
	Automobile Re-fuelling with no emission controls in operation	37
	Automobile Re-fuelling with Stage II controls in operation	14.8

Category 1B2av is one of the key sources for the following component (% of national total in 2015):

NMVOC	10.5%
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8.5. Natural Gas (1B2b)

In Cyprus there are no first treatment natural gas facilities. This category is reported as NO.

8.6. Venting and Flaring (1B2c)

A petroleum refinery was in operation in Cyprus until its termination in March 2004. Since then, all fuels consumed in Cyprus are imported.

Emissions from this NFR category until 2004 were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. Emissions were estimated based on the annual total throughput of the refinery. The quantity of crude oil was obtained from the national energy balance. The emission factors used are shown in **Table 42**.

No key sources are found in this category.

Table 42: EFs used in NFR 1B2c.

Pollutant	Emission Factor (g/m ³ refinery feed)
NO _x	54
NMVOC	2
SO _x	77
CO	12

The last few years drillings were conducted in EOZ of Cyprus since is expected to exploite hydrocarbons. Please note that there weren't any drillings in 2015. Emissions from this NFR category were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The emission factors used are shown in **Table 43**. No key sources are found in this category.

Table 43: EFs used in NFR 1B2c.

Pollutant	Emission Factor (Kg/Mg gas burned)
NO _x	1.4
NMVOC	1.8
SO _x	0.013
CO	6.3
PM _{2.5}	2.6
PM ₁₀	2.6
TSP	2.6
BC	24% of PM _{2.5}

8.7. Energy production (1B2d)

This category is reported as NO.

9. B_Industry

9.1 *Industry Emissions due to combustion process*

Industrial process emissions are based either on environmental reports of large industries or on the use of emission factors and activity (production and/ or fuel) data.

In Cyprus there is no large industrial activity. There is one cement production plant, one small size lime production industry and few brick and tiles factories. In addition, there are some small-scale food and drinks industries and quarrying activities. Sector Categories included in NFR 2B are reported as NO due to the fact that there is no chemical industry in Cyprus.

Petroleum refining (1A1b)

A petroleum refinery was in operation in Cyprus until its termination in March 2004. Since then, all fuels consumed in Cyprus are imported.

For the calculation of the emissions resulting from the plant, the petroleum refinery operators were using a spreadsheet provided by Shell International Company. Those emissions were included in their annual environmental report submitted to Cyprus national authority. Those emissions are included in the emission inventory.

Manufacture of Solid fuels and other energy industries (1A1c)

No such activity takes place in Cyprus.

Manufacturing Industries and Construction (1A2a – 1A2f)

Emission data from this sector are based mainly on emission factor and fuel used in each industrial sector.

The fuel consumption per sector is derived through questionnaires distributed to operators of industrial installations and collected by the Statistical Service. These data are presented in accordance with the NACE code. Emission inventory compilers, in order to estimate the pollutants emissions from this sector, make all the necessary transformations from the NACE code to the NFR code. Thus, the pollutants emissions from categories 1A2a – 1A2f are calculated based **on fuel consumption** and **emission factors**.

Emissions for the Heavy Metals, PCBs and HCBs for NFR sector 1.A.2.a to 1A.2.f were calculated based on the following equations:

- Fuel consumption x calorific value (14200 KJ/kg) x EF for Biomass
- Fuel consumption x calorific value (41870 KJ/kg) x EF for Liquid fuels

The EF was taken from CORINAIR Guidebook 2013, Chapter 1A2 and Table 3.4 for Liquid fuels and Table 3.5 for Biomass.

The main contributors to **1A2f sector** are cement production industries, ceramics (bricks and tiles) and lime production industry.

In Cyprus, one cement production industry, eight bricks and tiles industries and one lime production industry are operated.

Emission data from cement, ceramics and lime industries are based on their environmental annual reports. Activity data were provided from the annual environmental reports and emissions were calculated by the use of EFs, Tier 2 methodology, from the EMEP/EEA Air Pollutant Emission Inventory Guidebook [9].

In the case that no EFs were provided in Tier 2 methodology of the Guidebook, EFs from the Tier 1 methodology were used, such as PM_{2.5}, PM₁₀, TSP and BC. The emission factors used are given in **Table 44**. Emissions from the other industrial activities included in this NFR sector are based on fuel consumption.

Table 44: EFs used in NFR 1A2f.

Pollutant	Cement Production	Bricks & Tiles	Lime Production
NO _x	1241 g/tonne clinker	184 g/tonne	1369 g/tonne
NMVOC	18 g/tonne clinker	25 g/GJ	25 g/GJ
SO _x	374 g/tonne clinker	39.6 g/tonne	316 g/tonne
PM _{2.5}	20 g/GJ	20 g/GJ	20 g/GJ
PM ₁₀	20 g/GJ	20 g/GJ	20 g/GJ
TSP	20 g/GJ	20 g/GJ	20 g/GJ
BC	56% of PM _{2.5}	56% of PM _{2.5}	56% of PM _{2.5}
CO	1455 g/tn clinker	189 g/tonne	1940 g/tonne
Pb	0.098 g/tonne clinker	0.08 mg/GJ	0.08 mg/GJ
Cd	0.008 g/tonne clinker	0.006 mg/GJ	0.006 mg/GJ
Hg	0.049 g/tonne clinker	0.12 mg/GJ	0.12 mg/GJ
As	0.0265 g/tonne clinker	0.03 mg/GJ	0.03 mg/GJ
Cr	0.041 g/tonne clinker	0.2 mg/GJ	0.2 mg/GJ
Cu	0.0647 g/tonne clinker	0.22 mg/GJ	0.22 mg/GJ
Ni	0.049 g/tonne clinker	0.008 mg/GJ	0.008 mg/GJ
Se	0.0253 g/tonne clinker	0.11 mg/GJ	0.11 mg/GJ
Zn	0.424 g/tonne clinker	29 mg/GJ	29 mg/GJ
PCDD/F	4.1 ng/tonne clinker	1.4 ng/GJ	1.4 ng/GJ
Benzo(a)pyrene	0.000065 g/tonne clinker	1.9 mg/GJ	1.9 mg/GJ

Pollutant	Cement Production	Bricks & Tiles	Lime Production
Benzo(b)fluoranthene	0.00028 g/tonne clinker	15 mg/GJ	15 mg/GJ
Benzo(k)fluorathene	0.000077 g/tonne clinker	1.7 mg/GJ	1.7 mg/GJ
Indeno(1.2.3-cd)pyrene	0.000043 g/tonne clinker	1.5 mg/GJ	1.5 mg/GJ
HCB	4.6 µg/tonne clinker	NE	NE
PCBs	103 µg/tonne clinker	NE	NE

The activity data and the total annual emissions of the Cement Industries, Brick&Tiles and Lime Industries which are important industries and contribute essentially in the total emissions are shown in **Table 45**.

Table 45: Activity data and Total Emissions for Cement, Lime, Brick and Tiles Industries

Pollutant	Cement Industries		Bricks and Tiles Industries		Lime Industries	
	Activity data (tonnes)	Total Emissions	Activity data (tonnes)	Total Emissions	Activity data (tonnes)	Total Emissions
NO _x	1640717 (Clinker production)	2.04 (Gg)	87440 (bricks & tiles production)	0.016 (Gg)	3328 (lime production)	0.005 (Gg)
PM _{2.5}	Based on fuel consumption* ¹	0.104 (Gg)	Based on fuel consumption (LFO)	0.0030 (Gg)	Based on fuel consumption (LFO)	0.00028 (Gg)
PM ₁₀	Based on fuel consumption* ¹	0.104 (Gg)	Based on fuel consumption (LFO)	0.0030 (Gg)	Based on fuel consumption (LFO)	0.00028 (Gg)
TSP	Based on fuel consumption* ¹	0.104 (Gg)	Based on fuel consumption (LFO)	0.0030 (Gg)	Based on fuel consumption (LFO)	0.00028 (Gg)
CO	1640717 (Clinker production)	2.387 (Gg)	87440 (bricks & tiles production)	0.017 (Gg)	3328 (lime production)	0.006 (Gg)
Cd	1640717 (Clinker production)	0.013 (Mg)	Based on fuel consumption (LFO)	0.000001 (Mg)	Based on fuel consumption (LFO)	0.0000001 (Mg)
Hg	1640717 (Clinker production)	0.08 (Mg)	Based on fuel consumption (LFO)	0.00002 (Mg)	Based on fuel consumption (LFO)	0.000002 (Mg)
PCDD/F	1640717 (Clinker production)	0.007 (g)	Based on fuel consumption (LFO)	0.0002 (g)	Based on fuel consumption (LFO)	0.00002 (g)
HCB	1640717 (Clinker production)	0.0075 (Kg)	-	-	-	-
PCBs	1640717 (Clinker production)	0.037 (kg)	-	-	-	-

Category 1A2f is a key source for the following components (% of national total in 2015):

NO _x	14.1%
PM _{2.5}	11.0%
PM ₁₀	6.4%
TSP	4.6%
BC	22.8%
CO	16.8%
Cd	26.3%
Hg	90.8%
HCB	89.4%
PCBs	79.6%

Stationary Combustion in Manufacturing Industries: Other (1A2gviii)

This sector includes all combustion emissions from industrial sectors not belonging to the NFR categories 1A2a to 1A2f. This sector also includes some other activities such as leather, wood and plastics production.

No key sources are found in this category.

9.2. Industrial Emissions due to Production

In the Cyprus emission inventory, this category comprises emissions related to the production and use of non-metallic minerals in:

- 2A1 Cement clinker production
- 2A2 Lime production
- 2A5a Quarrying and mining of mineral other than coal
- 2A5b Construction and demolition
- 2A5c Storage, handling and transport of mineral products

The other categories are reported as Not Occurring (NO) due to the fact that those processes do not take place in Cyprus.

Cement production (2A1)

Two cement plants, initially belonging to two different companies, were in operation in Cyprus until 2011. The two companies merged and the new company built a new installation. The new installation, that uses dry process, is in operation since September 2011. Moni cement plant shut down in April 2011 and old Vassilikos cement plant shut down in September 2011.

The new cement plant has a maximum production capacity about 2.000.000 tones clinker per year. One stack is installed and all the gaseous wastes emitted from this stack. In

addition, a fabric filter is installed which result to about 98% reduction of TSP, 80% PM₁₀ and 73% PM_{2.5}.

Activity data are based on annual environmental reports and emissions are estimated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. In **Table 46** the emission factors used are given. Activity data (cement production) for the time series 1990-2015 are given in **Table 47**.

Table 46: EFs used in NFR 2A1.

Pollutant	Emission Factor (kg/Mg cement)
	Dry process
PM _{2.5}	0.26
PM ₁₀	0.468
TSP	0.52
BC	3% of PM _{2.5}

Table 47: Activity data from cement industries.

Year	Cement Production in tones	
	Moni Cement Plant	Vassilikos Cement Plant
1990	377785	761822
1991	405660	730738
1992	426479	706941
1993	423190	649074
1994	397410	659381
1995	407330	617077
1996	374445	670827
1997	373260	540794
1998	356775	852919
1999	364165	782294
2000	375875	1034101
2001	414170	962981
2002	430099	1049312
2003	454684	1204084
2004	452704	1319979
2005	449345	1381855
2006	448655	1352840
2007	462225	1438098
2008	475158	1429718
2009	271580	1233564
2010	295542	1143924
2011	39328	1167496
2012	closed	1025666
2013	closed	854890
2014	closed	734692

Year	Cement Production in tones	
	Moni Cement Plant	Vassilikos Cement Plant
2015	closed	788168

Category 2A1 cement clinker production is a key source for the following components (% of national total in 2014):

PM _{2.5}	5.52%
PM ₁₀	5.12%
TSP	3.71%

Lime production (2A2)

In Cyprus, one small-scale lime production plant is in operation. Emission data are based on the annual environmental report. Activity data were provided by the annual environmental report and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. In **Table 48** the emission factors used are given. No key sources are found in this category.

Table 48: EFs used in NFR 2A2.

Pollutant	Emission Factor (kg/Mg lime produced)
PM _{2.5}	0.7
PM ₁₀	3.5
TSP	9
BC	0.46 % of PM _{2.5}

Table 49: Activity data from Lime Industries

Year	Lime Production In tones	Year	Lime Production In tones
1990	4637	2003	12511
1991	4353	2004	11940
1992	4133	2005	14822
1993	5537	2006	12778
1994	7166	2007	12083
1995	4342	2008	12779
1996	4591	2009	10457
1997	5915	2010	11545
1998	4345	2011	8777
1999	5980	2012	4238
2000	6065	2013	2816
2001	7579	2014	3597
2002	11864	2015	3328

Quarrying and Mining of Minerals other than Coal (2A5a)

Activity data concerning the quantities of quarrying and mining of minerals other than coal were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. In **Table 50** the emission factors used are given.

Table 50: EFs used in NFR 2A5a.

Pollutant	Emission Factor
	(g/Mg mineral)
PM _{2.5}	3.8
PM ₁₀	25.0
TSP	51.0

Category 2A5a is a key source for the following components (% of national total in 2015):

PM ₁₀	7.10%
TSP	9.86%

Construction and Demolition (2A5b)

Activity data concerning the area in square meters refers to the floor area of the building or utility that is constructed or demolished were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. In **Table 51** the emission factors used are given.

Table 51: EFs used in NFR 2A5b.

Pollutant	Emission Factor (kg/m ² /year)
PM _{2.5}	0.00812
PM ₁₀	0.0812
TSP	0.162

Category 2A5b is a key source for the following components (% of national total in 2015):

PM ₁₀	4.15%
TSP	5.98%

Storage, Handling and Transport of Mineral Products (2A5c)

Activity data concerning the quantities of mineral products were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. In **Table 52** the emission factors used are given.

Table 52: EFs used in NFR 2A5c.

Pollutant	Emission Factor
	(g/Mg product)
PM _{2.5}	0.6
PM ₁₀	6.0
TSP	12.0

No key sources are found in this category.

In **Table 53**, the activity data used in the NFR categories 2A5a, 2A5b and 2A5c are given.

Table 53: Activity data from NFR sectors 2A5a, 2A5b and 2A5c.

Year	NFR 2A5a	NFR 2A5b	NFR 2A5c
	Gravel and Sand Mineral (Gg)	Constructed and Demolished Area (*1000 m ²)	Gravel and Sand production (Gg)
2000	10714	1753	9740
2001	10714	2163	9740
2002	11770	2396	10700

Year	NFR 2A5a	NFR 2A5b	NFR 2A5c
	Gravel and Sand Mineral (Gg)	Constructed and Demolished Area (*1000 m ²)	Gravel and Sand production (Gg)
2003	12419	2752	11290
2004	13596	3016	12360
2005	14080	3417	12800
2006	14278	3507	12980
2007	15460	3613	14055
2008	16666	3689	15151
2009	13860	3136	12600
2010	14754	2918	13413
2011	13777	2253	12525
2012	8311	1500	7556
2013	5280	1045	4800
2014	4598	785	4180
2015	4598	881	4180

9.3. Metal production (2C)

Two metal production industries, foundries, were in operation in Cyprus until their termination in 2005. In the 2015 national emission inventory, this category is reported as Not Occurring (NO).

9.4. Food and Drink (2H2)

Emissions from NFR category 2H2 were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. Activity data concerning the different food and drink products produced in the food and drink industry were provided by the Statistical Service of Cyprus. The emission factors used are given in **Table 54**.

Table 54: VOCs EFs used in NFR 2H2.

Type of Food Products	Emission Factor (kg/Mg product)
Cakes, Biscuits, Breakfast cereals	1
Meat, Fish & Poultry	0.3
Sugar	10
Margarine & solid cooking fats	10
Coffee Roasting	0.55

Type of Drink Products	Emission Factor (kg/hl product)
Wine	0.08
Beer	0.035
Whisky	15
Brandy	3.5
Other spirits	0.4

No key sources are found in this category.

9.5. Others (2D3b and 2D3c)

Road Paving with Asphalt (2D3b)

Activity data concerning the annual weight of asphalt used in road paving were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. The emission factors used are given in **Table 55** and the activity data in **Table 56**. The Mixing plants operating in Cyprus are equipped with fabric filters with abatement efficiency of 99.9%. No key sources are found in this category.

Table 55: EFs used in NFR 2D3b

Pollutant	Emission Factor
	(g/Mg asphalt)
NMVOC	15
PM _{2.5}	700
PM ₁₀	3000
TSP	13000
BC	5.7 % of PM _{2.5}

Table 56: Activity data from NFR sector 2D3b

Year	NFR 2D3b
	Bituminous mixtures
	(Gg)
2000	563
2001	458
2002	499
2003	473
2004	566
2005	451
2006	408
2007	378
2008	358

Year	NFR 2D3b
	Bituminous mixtures
	(Gg)
2009	609
2010	814
2011	794
2012	620
2013	327
2014	151
2015	151

Asphalt Roofing (2D3c)

Activity data concerning shingle were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The emission factors used are given in **Table 57**.

Table 57: EFs used in NFR 2D3c

Pollutant	Emission Factor
	(g/Mg shingle)
NMVOc	130
TSP	1600
PM _{2.5}	80
PM ₁₀	400
BC	0.013% of PM _{2.5}
CO	0.01

Category 2D3c is a key source for the following component (% national total 2015).

TSP	5.05%
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The activity data used in the NFR category 2D3c, are given in **Table 58**.

Table 58: Activity data from NFR Sector 2D3c

Year	NFR 2D3c Shingle (Gg)
2000	282
2001	229
2002	250
2003	237
2004	283
2005	225
2006	204
2007	189
2008	179
2009	305
2010	407
2011	397
2012	310
2013	164
2014	75
2015	75

10. E_Solvents

10.1. Domestic Solvent Use (2D3a)

Activity data concerning the Cyprus population were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The NMVOC emission factor used is 0.239kg/person/year. Category 2D3a is a key source for the following components (% of national total in 2015):

NMVOC	2.72%
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10.2. Coating Application (2D3d)

Activity data concerning the quantities of paints consumed in industrial and domestic sectors in Cyprus (both produced and imported) were provided by the Statistical Service and emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9].

In 2011, the provisions of the Paints Directive 2004/42/EC (Directive on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products - Decopaint) have been fully implemented. Thus, reduction efficiencies were applied for this category as described in the Guidebook. For each kind of paint the Emission Factor used is presented in the following **Table 59**. Activity data for NFR sector 2D3d are given in **Table 60**.

For **decorative coating application** the abatement efficiency corresponding to the substitution with dispersion / emulsion and water-based paints was used, due to the full implementation of the provisions of Decopaint EU Directive (2004/42/EC).

For **industrial coating application** (car repairing) the abatement efficiency corresponding to high solid surface and basic cleaner agent was used. In addition, for industrial coating application (wood coating), the abatement efficiency corresponding to medium solids system (upper 95% confidence interval) was used.

Table 59: EFs and Abatement Efficiencies used in NFR 2D3.

Paint	NMVOCs EF g/kg	Abatement efficiencies
Water based	230	65%
Car repairing – Solvent based	720	8%
Wood Coating – Solvent based	800	50%

Category 2D3d “Coating application” is a key source for the following components (% of national total in 2015):

NMVOC	21.72%
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Table 60: Activity data for NFR sector 2D3d

Year	Decorative coating application (ton)	Industrial coating application (ton)
2000	5846	328
2001	5740	202
2002	8535	376
2003	8330	1174
2004	9452	1758
2005	8993	2228
2006	10277	2122
2007	10403	2459
2008	10279	2789
2009	9106	2773
2010	10375	3020
2011	8533	1972
2012	8371	2116
2013	7079	1895
2014	6366	1632
2015	7338	2269

10.3. Dry Cleaning (2D3f)

Activity data are provided by the annual environmental reports submitted by the owners of the Dry Cleaning shops and NMVOC emissions were calculated based on solvent consumption data. No key sources are found in this category.

10.4. Chemical products (2D3g)

Activity data concerning the quantities of paints produced in the industrial sector were provided by the Statistical Service and emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. The NMVOC emission factor used is 11g/kg product.

Due to the full implementation of the provisions of Decopaint EU Directive (2004/42/EC) the abatement efficiency 70%, corresponding to the improved production mix were applied for this category as described in the Guidebook. No key sources are found in this category.

10.5. Printing (2D3h)

Activity data concerning the consumption of ink in printing industries were provided by the Statistical Service of Cyprus (**Table 61**) and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The NMVOC emission factor used is 500g/kg ink. Category 2D3h is a key source for the following components (% of national total in 2015):

NMVOC	3.32%
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Table 61: Activity data for NFR sector 2D3h

Year	Ink Consumption (ton)
2000	459605
2001	520726
2002	421281
2003	395077
2004	465634
2005	472006
2006	497028
2007	437737
2008	612135
2009	446561
2010	482148
2011	655067
2012	520175
2013	405445
2014	512335
2015	494393

10.6. Other Product Use (2G)

Activity data concerning the annual weight of tobacco and fireworks used were provided by the Statistical Service of Cyprus and emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. In **Table 62** the emission factors used are given. Activity data for the Category 2G are given in **Table 63**. Category 2G is a key source for the following component (% of national total in 2015):

PM _{2.5}	3.72%
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Table 62: EFs used in NFR 2G

Pollutants	Emission Factors	
	Tobacco combustion	Use of fireworks
NO _x	1.8 Kg/Mg tobacco	260 g/t product
NMVOG	4.84 Kg/Mg tobacco	NE
SO _x	NE	3020 g/t product
NH ₃	4.15 Kg/Mg tobacco	NE
TSP	27 Kg/Mg tobacco	109.83 g/t product
PM ₁₀	27 Kg/Mg tobacco	99.92 g/t product
PM _{2.5}	27 Kg/Mg tobacco	51.94 g/t product
BC	0.45% of PM _{2.5}	NE
CO	55.1 Kg/Mg tobacco	7150 g/t product
Pb	NE	784 g/t product
Cd	5.4 g/Mg tobacco	1.48 g/t product
Hg	NE	0.057 g/t product
As	NE	1.33 g/t product
Cr	NE	15.6 g/t product
Cu	5.4 g/Mg tobacco	444 g/t product
Ni	2.7 g/Mg tobacco	30 g/t product
Zn	2.7 g/Mg tobacco	260 g/t product
PCDD/F	0.1 µg/Mg tobacco	NE
Benzo(a)pyrene	0,111 g/Mg tobacco	NE
Benzo(b)fluoranthene	0,045 g/Mg tobacco	NE
Benzo(k)fluorathene	0,045 g/Mg tobacco	NE
Indeno(1.2.3-cd)pyrene	0.045 g/Mg tobacco	NE

Table 63: Activity data from NFR sector 2G

Year	NFR 2G	NFR 2G
	Tobacco (Kg)	Fireworks (Kg)
2000	10694524	43650
2001	3291543	43650
2002	3081252	43650
2003	2219167	43650
2004	3301626	43650
2005	2877075	43650
2006	1796955	43650
2007	1871656	43650
2008	1820672	43650
2009	2024716	43650
2010	2162450	43650
2011	1766789	7006
2012	1919818	33077
2013	1507409	1579
2014	597867	28039
2015	1376328	19873

11. K_AgriLivestock & L_AgriOther

The Agriculture sector is a major source category for ammonia, NMVOC and particulates emissions. For ammonia emissions from agriculture two different sources are distinguished: animal manure and synthetic fertilizer.

11.1. Agriculture Livestock (3B)

Activity data concerning the number of animals at any time were provided by the Agriculture Department of Cyprus and are given in **Table** below. Emissions from NFR 3B were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. Emissions of 2015 were calculated using Tier 2 methodology. Emission factors used are presented in **Table 65**.

Table 64: Number of animals – Population size (1000 head).

NFR	Long name	1990	1995	2000	2010	2011	2012	2013	2014	2015
3B1a	Cattle dairy	22.4	29.5	23.5	23.4	24.1	24.1	24.5	25.3	26.1
3B1b	Cattle non dairy	32.3	38.7	30.7	31.3	32.8	32.8	32.5	34.2	32.7
3B2	Sheep	195	173	190	227.3	257.2	241.3	217.8	214.4	214.4
3B3	Swine: Fattening pigs	106.6	112.8	132	157.8	147.0	134.2	125.9	113.4	120.2
3B4	Swine: Sows	33.8	48.4	52.1	46.3	40.5	36.3	35.1	34.0	31.8
3B4d	Goats	140	170	268	220	207.0	193.3	168.2	160.2	154.7
3B4e	Horses	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3B4f	Mules and asses	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
3B4gi	Laying hens	640.9	764.4	550	555.2	593.8	649.6	640.9	593.8	539.6
3B4gii	Broilers	2993	3623	4200	3224	3074	2830	2441	3074	2605
3B4giii	Turkeys	53.7	58.7	65	14.1	10.7	8.6	9.3	9.5	9.7
3B4giv	Other poultry	6.7	13.3	15	0	0	0	0	0	0

Table 65: EFs used in NFR 3B.

NFR	Long name	NO _x	NMVOG	NH ₃	PM _{2.5}	PM ₁₀	TSP
		(kg/animal)					
3B1a	Cattle dairy	0.154	17.937	28.7	0.41	0.63	1.38
3B1b	Cattle non dairy	0.094	8.902	9.2	0.18	0.27	0.59
3B2	Sheep	0.005	0.279	1.4	0.0167	0.0556	0.139
3B3	Swine: Fattening pigs	0.001	0.551	6.7	0.06	0.34	0.75
3B3	Swine: Sows	0.004	1.704	15.8	0.12	0.69	1.53
3B4d	Goats	0.005	0.624	1.4	0.0167	0.0556	0.139
3B4e	Horses	0.131	7.781	14.8	0.14	0.22	0.48
3B4f	Mules and asses	0.131	3.018	14.8	0.1	0.16	0.34
3B4gi	Laying hens	0.003	0.165	0.48	0.023	0.119	0.119
3B4gii	Broilers	0.001	0.108	0.22	0.009	0.069	0.069
3B4giii	Turkeys	0.005	0.489	0.95	0.07	0.52	0.52
3B4giv	Other poultry	0.004	0.489	0.515	0.025	0.19	0.19

Dairy Cattle (3B1a)

Category 3B1a is a key source for the following components (% of national total in 2015):

NMVOG	2.79%
NH ₃	23.62%

Non – dairy cattle (3B1b)

Category 3B1b is a key source for the following components (% of national total in 2015):

NMVOG	4.47%
NH ₃	6.88%

Sheep (3B2)

No key source are found in this Category

Swine (3B3)

Category 3B3 is a key source for the following components (% of national total in 2015):

NH ₃	30.32%
PM ₁₀	3.68%
TSP	5.94%

Goats (3B4d)

No key sources are found in this category.

Horses (3B4e)

No key sources are found in this category.

Mules and asses (3B4f)

No key sources are found in this category

Laying hens (3B4gi)

Category 3B4gi is a key source for the following components (% of national total in 2015):

NH ₃	6.10%
TSP	3.76%

Broilers (3B4gii)

Category 3B4gii is a key source for the following components (% of national total in 2015):

NMVOC	2.90%
NH ₃	6.10%
PM ₁₀	5.22%
TSP	3.76%

No key sources are found in the categories 3B4giii "Turkeys" and 3B4giv "Other poultries".

11.2. Agriculture Other (3D)

Synthetic N-Fertilizers (3Da1)

Activity data concerning the amount of applied nitrogen fertilizers were provided by the Statistical Service are given in **Table 65** Emissions were calculated based on Tier 1

methodology of the EMEP/EEA Guidebook [9]. The emission factors used are presented in Table 67.

Table 66: Activity data from NFR 3Da1.

Year	N-Fertilizers applied (in Mg)	Area covered by crop (in hectares)
1990	14190	57500
1991	14330	58790
1992	17935	65110
1993	15144	69100
1994	14773	63500
1995	13973	60870
1996	14742	58940
1997	11790	58020
1998	9954	59090
1999	10621	58940
2000	10707	51480
2001	11673	55970
2002	9346	59200
2003	7459	72700
2004	8442	66400
2005	8964	62100
2006	8126	59200
2007	7655	43600
2008	5981	38700
2009	4920	31200
2010	6137	32900
2011	4504	35900
2012	4864	37800
2013	4709	30800
2014	3847	25303
2015	4156	33385

Table 67: EFs used in NFR 3D1a.

Pollutant	Emission Factor
NO _x	0.026 kg/kg fertilizer-N applied
NMVO _C	0.86 kg/ha
NH ₃	0.081 kg/kg fertilizer-N applied
PM _{2.5}	0.06 kg/ha
PM ₁₀	1.56 kg/ha

Category 3Da1 is a key source for the following component (% of national total in 2015):

NH ₃	7.40%
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The applied kg of fertilizer per hectare of area was decreased during the last years due to the following reasons: a) Cost.- The farmers tried to minimize their cost by reducing the

amounts of fertilizers applied per hectare and b) Training of Farmers.- At the beginning the farmers were overdosing their fields but now, after been educated by the people of the MARDE, the applied amount of fertilizer is decreased.

11.3. Field Burning of Agricultural Residues (3F)

Activity data concerning the amount of crop residue burned were provided by the Statistical Service and emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The emission factors used are presented in **Table 68**.

Table 68: EFs used in NFR 3F.

Pollutant	Emission Factor
NO _x	0.0023 kg/kg dry matter
NM VOC	0.0005 kg/kg dry matter
SO _x	0.0005 kg/kg dry matter
NH ₃	0.0024 kg/kg dry matter
PM _{2.5}	0.0054 kg/kg dry matter
PM ₁₀	0.0057 kg/kg dry matter
TSP	0.0058 kg/kg dry matter
BC	500 mg/kg dry matter
CO	0.0667 kg/kg dry matter
Pb	0.11 mg/kg dry matter
Cd	0.88 mg/kg dry matter
Hg	0.14 mg/kg dry matter
As	0.0064 mg/kg dry matter
Cr	0.08 mg/kg dry matter
Cu	0.073 mg/kg dry matter
Ni	0.052 mg/kg dry matter
Se	0.02 mg/kg dry matter
Zn	0.56 mg/kg dry matter
PCDD/F	0.5 µg I-TEQ/t
Benzo(a)pyrene	67.7 mg/kg dry matter
Benzo(b)fluoranthene	189.1 mg/kg dry matter
Benzo(k)fluorathene	80.7 mg/kg dry matter
Indeno(1.2.3-cd)pyrene	57.9 mg/kg dry matter

Category 3F is a key source for the following component (% of national total in 2015):

PAHs	64.94%
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12. J_Waste

12.1. Solid Waste Disposal on Land (5A)

Activity data concerning the amount of solid waste disposal on land were provided by the Statistical Service. Emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The NMVOC emission factor used is 1.56 Kg / Mg waste.

Category 5A is a key source for the following component (% of national total in 2015):

NMVOC	8.44%
PM10	5.13%
TSP	7.81%

Activity data are presented in **Table 69**.

Table 69: Activity data from NFR 5A.

Year	Solid Waste Disposal (in Gg)
1990	338
1991	348
1992	358
1993	369
1994	381
1995	387
1996	389
1997	398
1998	406
1999	413
2000	423
2001	442
2002	450
2003	467
2004	482
2005	489
2006	500
2007	512
2008	531
2009	540
2010	490
2011	461
2012	451
2013	423
2014	398
2015	403

12.2. Waste Water Handling (5D1)

Activity data concerning the total amount of waste water handled by all the wastewater treatment plants in Cyprus were provided by the Water Development Department of MARDE. Emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The NMVOC emission factor used is 15 mg/m³ wastewater.

No key sources are found in this category.

12.3. Clinical Waste Incineration (5C1biii)

As far as clinical waste incineration is concerned, three incinerators were in operation in Cyprus until 2003 when their operations were terminated. Since then, all clinical wastes are subjected to sterilization. In addition, no municipal (NFR 5C1a), industrial (NFR 5C1bi), hazardous (NFR 5C1bii) or sewage sludge (NFR 5C1biv) waste incineration takes place in the island.

12.4. Cremation (5C1bv)

In Cyprus there is one plant in operation for the incineration of animal carcasses. Activity data concerning the amount (number) of animal bodies incinerated were provided by the annual environmental report of the operator of the incinerator. Emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. The operator of the incinerator does not keep records of the total number of animals per category incinerated. However, the operator of the incinerator reports that the number of cows burned is bigger than the number of sheep burned. Therefore, the emission factors used for the estimation of the emissions of these pollutants are those that correspond to cows and are presented in **Table 70**. Furthermore, it should be mentioned that in Cyprus there is no cremation of human bodies. In 2008, a relevant legislation on cremation of human bodies was enacted in Cyprus. However, there is no application submitted yet to build crematoria.

Table 70: EFs used in NFR 5C1bv

Pollutant	Emission Factor
PM _{2.5}	0.538 kg/Mg waste
PM ₁₀	0.628 kg/Mg waste
TSP	0.897 kg/Mg waste

No key sources are found in this category.

12.5. Open Burning waste (5C2)

Activity data concerning the amount of material burned are based on assumptions made by the inventory team. The assumptions concern the number of bonfires and the amount of

wood burned per bonfire (2 tons). Emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The emission factors used are presented in **Table 71**.

Table 71: EFs used in NFR 5C2.

Pollutant	Emission Factor
NMVOC	1.23 kg/Mg waste
NO _x	3.18 kg/Mg waste
PM _{2.5}	4.19 kg/Mg waste
PM ₁₀	4.51 kg/Mg waste
TSP	4.64 kg/Mg waste
PCDD/F	10 µg I-TEQ/Mg waste
Total 3 PAHs	12.64 g/Mg waste

No key sources are found in this category.

12.6. Domestic Wastewater Handling (5D1)

Activity data concerning the amount of domestic wastewater handling are taken from Water Development Department which is responsible for the handling of the municipal wastewater. Emissions were calculated based on Tier 1 methodology of the EMEP/EEA Guidebook [9]. The emission factors for NMVOC used is 15mg / m³ wastewater.

No key sources are found in this category.

12.7. Other Disposal (5E)

Activity data concerning the other waste (Accidental fires of cars and buildings) are taken from the Police Statistical Service. Emissions were calculated based on Tier 2 methodology of the EMEP/EEA Guidebook [9]. The emission factors used are presented in **Table 72**.

Table 72: EFs used in NFR 5E.

Pollutant	Emission Factor
PM _{2.5}	2.3 kg/fire
PM ₁₀	2.3 kg/fire
TSP	2.3 kg/fire
PCDD/F	0.048 mg/fire

No key sources are found in this category.

13. Recalculations and Improvements

13.1. Recalculations

In the preparation of the 2015 submission, some methodological improvements were included in the national emission inventory. This led to recalculations of the time series 1990-2014, aiming at the improvement of the accuracy of the emission data. The main reason of the recalculations was the full implementation of the provisions of the new EMEP/EEA Emission Inventory Guidebook 2013.

The following major changes can be distinguished:

- NFR Category K_Agrilivestock

3B Manure emissions calculations for the years 2008 to 2015 were done based on the methodology proposed in the new EMEP/EEA Emission Inventory Guidebook 2013. In the next submission we will try to find data to recalculate the emissions from this category for the previous years.

- NFR Category F_RoadTransport

The emissions from the road transport sector were recalculated because we have implemented the new COPERT 5 software instead of the previous version COPERT 4.

- NFR Category 1A4bi / 1A2gviii

New activities were conducted in years 2011, 2013 and 2014 in Cyprus Economic Exclusive Zone. Drillings for the exploitation of hydrocarbons were made and for this reasons, emissions from the drillings machines, the ships going and coming to the area where the drillings were occurring, were inserted in Cyprus National Emissions Inventory. The emissions of the drillings in an agreement with the Statistical Service people were removed from 1A4bi category to the 1A2gviii one.

- 1A2f / 3F

Recalculations were done for the following categories due to wrong formulas:

- a) 1A2f / SO_x : For the years 1990 – 2010
- b) 1A2f / CO : For the years 2008 – 2014
- c) 3F/ PAHs : For the years 1990 – 2014

13.2. Improvements

In 2010, a project titled “Development of an emission inventory including formation of a database for atmospheric pollutant emissions and a software for simulation and forecast of air quality in Cyprus” was executed by the Department of Labour Inspection. Within this

project, a new software tool was established for the inventory preparation. The general objectives of the project were:

- Collection of activity data from all emission-generating sources.
- Development of an emission database based on methodology of the EMEP/EEA Emission Inventory Guidebook.
- Development of a GIS application for the presentation of activity data and emissions on digital maps.
- Development of a web-based application for the evaluation and management of air quality.
- This new database has been combined with COPERT 5 software which is used for the emissions calculations comes from transportation. The output of COPERT is used as an input for this new database.

14. Projections

Under the negotiations on the revision of the National Emissions Ceilings Directive [21], projections were made for all the member states to set national emission ceilings for the year 2030 by the IIASA Institute. The IIASA has presented a report [20] to European Commission which describes the methodology for the estimation of 2030 and proposes emission ceilings for all the member states. Since there were a lot of discussions for the correctness of these calculations with various Member States, the European Commission gave the opportunity to each member to have negotiations with representatives of IIASA, regarding the emissions reductions limits. Cyprus experts provided them with its own projections / calculations. Both IIASA and Cyprus projections / calculations are mentioned in TSAP16a of IIASA report [18].

For EU countries the baseline projection assumes:

- the implementation of all emission control legislation as laid down in national laws,
- compliance with the existing National Emission Ceilings Directive [11],
- compliance with the amended Protocol of Gothenburg in 2012
- the implementation of emission control measures for heavy duty vehicles,
- the implementation of the Directive on Industrial Emissions [15] for stationary sources and
- the implementation of EURO-VI standard from 2014 onwards.

The projections for the years 2020 up to 2030 for Cyprus have been based on Cyprus experts projections of the activity data [18] and special provisions on the IED Directive [15] for Cyprus.

Special provisions for Cyprus on Articles 33 and 34 of the IED

According to Directive 2003/54/EC, Cyprus is considered a «small isolated system» (any system with consumption of less than 3000 GWh in the year 1996, where less than 5% of annual consumption is obtained through interconnection with other systems). Therefore, one of its power generation plants falls into the provisions of the Article 33(3) of the IED, which states that: “In case of a combustion plant being, on 6 January 2011, part of a small isolated system and accounting at that date for at least 35% of the electricity supply within that system, which is unable, due to its technical characteristics, to comply with the emission limit values referred to in Article 30(2), the number of operating hours referred to in paragraph 1(a) of this Article shall be 18000, starting from 1.1.2020 and ending no later than 31.12.2023”.

Based on the above, the Dhekelia Power Station will continue to work until 31.12.2023 with limited life time derogation using the emission limit values set out in the permit pursuant in particular to the requirements of Directives 2001/80/EC (LCP) and 2008/1/EC (IPPC). Therefore, Dhekelia Power Station will continue to operate using liquid fuels with less than 1% sulphur content.

2020 Emission Projections / Obligations

Based on the above, the Cyprus emission obligations for the SO₂, NO_x, VOC, NH₃ and PM_{2.5} annual emissions are the following (revised Gothenburg Protocol in 2012):

SO ₂	NO _x	VOC	NH ₃	PM _{2.5}
-83%	-44%	-45%	-10%	-46%

The figures in the above table show the percentage of reduction compare to the total emissions of the reference year 2005.

Policies and Measures in order to achieve the above mentioned targets

The national policies are prepared, updated, and monitored by the Ministry of Agriculture, Rural Development and Environment (MARDE), in collaboration with the responsible Ministry for each measure or policy. Currently, the main focus of the policy related to reduction of gas emissions is energy. The sectors of energy for which most measures are implemented are A_Public Power and F_Road Transport.

The policies and measures currently in implementation are presented in **Table 73**.

Table 73: List of Policies and Measures.

A. Energy
A1. Natural Gas
A2. Renewable Energy Sources
A2.1. Renewable Energy Sources in Electricity Production
A2.2. Renewable Energy Sources for Heating and Cooling
A2.3. Renewable Energy Sources in Transport
A3. Energy efficiency and savings
A3.1. Savings from Energy Efficiency in Residential Buildings
A3.2. Savings from Energy Efficiency in Tertiary Buildings
A3.3. Savings from Efficient Bulbs
A3.4. Savings from Insulation in Residential Sector
A3.5. Savings in Existing Companies
A4. Energy savings from promotion of biomass and alternative fuels in industry
B. Transport
B1. Reduction in fuel consumption for transport from the promotion of public transport
C. Agriculture
C1. Reduction of emissions from manure management from the promotion of Anaerobic Digestion for animal waste
D. Waste
D1. Reduction of emissions from controlled waste management sites from biogas recovery
D2. Reduction of emissions from wastewater treatment from the promotion of Anaerobic Digestion
D3. Reduction of organics to landfill
D4. Separate organics collection

Reduction of emissions from uncontrolled waste management sites from management of uncontrolled disposal sites was a measure which has been fully implemented by 2013.

More details regarding each policy and measure, as well as, the projections of the energy sector (A_Public Power and F_RoadTransport) could be found in the following report submitted to UNFCCC by the Department of Environment of the MARDE.

http://cdr.eionet.europa.eu/cy/eu/mmr/art04-13-14_lcds_pams_projections/pams/ [17]

15. IIR References

1. Cyprus Informative Inventory Report 2008, March 2010
2. Cyprus Informative Inventory Report 2009, March 2011
3. Cyprus Informative Inventory Report 2010, March 2012.
4. Cyprus Informative Inventory Report 2011, February 2013
5. Cyprus Informative Inventory Report 2012, March 2014.
6. Cyprus Informative Inventory Report 2013, March 2015.
7. EMEP/Corinair Atmospheric Emission Inventory Guidebook 2007 – December 2007, EEA Technical Report No. 16/2007.
8. EMEP/EEA Air Pollutant Emission Inventory Guidebook 2009 – June 2009, EEA Technical Report No. 6/2009.
9. EMEP/EEA Air Pollutant Emission Inventory Guidebook 2013 – August 2013, EEA Technical Report No. 12/2013.
10. United Nations Economic Commission for Europe, ECE/EB.AIR/97, Guidelines for Reporting Emission Data under the Convention LRTAP, 27 January 2009.
11. Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants. OJ L 309, 27.11.2001, p. 1-21.
12. Report for the Stage 3 in-depth Review of Emission Inventories submitted under the UNECE LRTAP Convention and EU National Emission Ceilings Directive for Cyprus, September 2010 (CEIP/S3.RR/2010/CYPRUS).
13. The 1999 Protocol to the Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground Level Ozone (Gothenburg Protocol).
14. Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants. OJ L 309, 27.11.2001, p. 22-30.
15. Directive 2010/75/EE of the European Parliament and of the Council of 24 November 2010 on industrial emissions. OJ L 334, 17.12.2010, p. 17-119.
16. Cyprus Energy Regulatory Authority, Annual Report 2013, September 2014
17. Cyprus' update on the national system for policies and measures and projections, the low-carbon development strategy, climate policies and measures and greenhouse gas projections, March 2016.
18. Adjusted historic emission data, projections, and optimized emission reduction targets for 2030 –A comparison with COM data 2013 - Part A: Results for EU-28 / IIASA TSAP16a Report
19. Proposal for a Directive of the European Parliament and of the Council on the reduction of national emissions of certain atmospheric pollutants and amending Directive 2003/35/EC [Institutional File 2013/0443 (COD)]

12. Annex 1: Level Assessment 2015

Key Category Analysis

Level Assessment 2015

Table 74: NOx Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	4844.57	32.02%	32.02%
1A3biii	Road transport: Heavy duty vehicles and buses	2942.86	19.45%	51.46%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	2138.04	14.13%	65.59%
1A3bi	Road transport: Passenger cars	1282.70	8.48%	74.07%
1A3bii	Road transport: Light duty vehicles	1272.58	8.41%	82.48%
1A3ai(i)	International aviation LTO (civil)	666.96	4.41%	86.89%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	467.57	3.09%	89.98%
1A4ci	Agriculture/Forestry/Fishing: Stationary	335.03	2.21%	92.19%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	273.30	1.81%	94.00%
1A4bi	Residential: Stationary	166.31	1.10%	95.09%
3Da1	Inorganic N-fertilizers (includes also urea application)	165.69	1.09%	96.19%
1A3dii	National navigation (shipping)	128.51	0.85%	97.04%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	98.42	0.65%	97.69%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	71.75	0.47%	98.16%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	69.63	0.46%	98.62%
1A5b	Other, Mobile (including military, land based and recreational boats)	47.79	0.32%	98.94%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	44.15	0.29%	99.23%
1A3biv	Road transport: Mopeds & motorcycles	40.46	0.27%	99.50%
1A3aii(i)	Domestic aviation LTO (civil)	26.16	0.17%	99.67%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	21.63	0.14%	99.81%
3B3	Manure management - Swine	7.00	0.05%	99.86%
3F	Field burning of agricultural residues	4.61	0.03%	99.89%
3B1a	Manure management - Dairy cattle	3.23	0.02%	99.91%
3B4gii	Manure management - Broilers	3.22	0.02%	99.93%
2G	Other product use (please specify in the IIR)	2.48	0.02%	99.95%
5C2	Open burning of waste	2.18	0.01%	99.96%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	1.24	0.01%	99.97%

Table 74: NOx Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3B1b	Manure management - Non-dairy cattle	1,24	0,01%	99,98%
3B4gi	Manure management - Laying hens	1,16	0,01%	99,99%
3B2	Manure management - Sheep	0,53	0,00%	99,99%
3B4d	Manure management - Goats	0,38	0,00%	99,99%
3B4f	Manure management - Mules and asses	0,35	0,00%	100,00%
3B4e	Manure management - Horses	0,26	0,00%	100,00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0,11	0,00%	100,00%
	Total	15128.09	100.00%	

Table 75: NMVOC Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
2D3d	Coating applications	1617.35	21.72%	21.72%
1A3bv	Road transport: Gasoline evaporation	1186.70	15.94%	37.66%
1B2av	Distribution of oil products	782.18	10.50%	48.16%
1A3bi	Road transport: Passenger cars	690.50	9.27%	57.43%
5A	Biological treatment of waste - Solid waste disposal on land	628.68	8.44%	65.88%
1A3biv	Road transport: Mopeds & motorcycles	402.65	5.41%	71.28%
2D3h	Printing	247.20	3.32%	74.60%
3B4gii	Manure management - Broilers	216.09	2.90%	77.50%
3B1a	Manure management - Dairy cattle	207.67	2.79%	80.29%
2D3a	Domestic solvent use including fungicides	202.74	2.72%	83.02%
1A3biii	Road transport: Heavy duty vehicles and buses	165.23	2.22%	85.23%
3B3	Manure management - Swine	158.53	2.13%	87.36%
2H2	Food and beverages industry	156.11	2.10%	89.46%
3B1b	Manure management - Non-dairy cattle	128.27	1.72%	91.18%
1A3bii	Road transport: Light duty vehicles	123.56	1.66%	92.84%
1A1a	Public electricity and heat production	81.50	1.09%	93.94%
1A4bi	Residential: Stationary	53.77	0.72%	94.66%
2D3f	Dry cleaning	52.67	0.71%	95.37%
3B4gi	Manure management - Laying hens	44.56	0.60%	95.96%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	37.62	0.51%	96.47%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	29.96	0.40%	96.87%
3Da1	Inorganic N-fertilizers (includes also urea application)	28.71	0.39%	97.26%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	26.26	0.35%	97.61%
1A3ai(i)	International aviation LTO (civil)	25.74	0.35%	97.96%
3B2	Manure management - Sheep	19.33	0.26%	98.22%
1A4ci	Agriculture/Forestry/Fishing: Stationary	16.33	0.22%	98.43%

Table 75: NMVOC Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3B4e	Manure management - Horses	16.25	0.22%	98.65%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	11.96	0.16%	98.81%
3B4d	Manure management - Goats	10.46	0.14%	98.95%
2D3g	Chemical products	9.88	0.13%	99.09%
2D3c	Asphalt roofing	9.81	0.13%	99.22%
3B4f	Manure management - Mules and asses	9.61	0.13%	99.35%
1A3dii	National navigation (shipping)	9.26	0.12%	99.47%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	7.19	0.10%	99.57%
2G	Other product use (please specify in the IIR)	6.66	0.09%	99.66%
1A3aii(i)	Domestic aviation LTO (civil)	5.61	0.08%	99.73%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	4.80	0.06%	99.80%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	3.50	0.05%	99.84%
1A5b	Other, Mobile (including military, land based and recreational boats)	3.11	0.04%	99.89%
3B4giii	Manure management - Turkeys	2.75	0.04%	99.92%
2D3b	Road paving with asphalt	2.26	0.03%	99.95%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	1.05	0.01%	99.97%
3F	Field burning of agricultural residues	1.00	0.01%	99.98%
5C2	Open burning of waste	0.84	0.01%	99.99%
5D1	Domestic wastewater handling	0.48	0.01%	100.00%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.09	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.01	0.00%	100.00%
	TOTAL	7.45	100.00%	

Table 76: SOx Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	11357.90	86.35%	86.35%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	693.82	5.27%	91.62%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	433.58	3.30%	94.92%
1A4bi	Residential: Stationary	150.27	1.14%	96.06%
1A3dii	National navigation (shipping)	126.56	0.96%	97.02%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	91.64	0.70%	97.72%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	66.81	0.51%	98.23%
1A5b	Other, Mobile (including military, land based and recreational boats)	59.07	0.45%	98.68%
1A3ai(i)	International aviation LTO (civil)	50.77	0.39%	99.06%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	38.67	0.29%	99.36%
1A4ci	Agriculture/Forestry/Fishing: Stationary	31.20	0.24%	99.59%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	20.14	0.15%	99.75%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	15.60	0.12%	99.86%
1A3bi	Road transport: Passenger cars	7.63	0.06%	99.92%
1A3aii(i)	Domestic aviation LTO (civil)	3.74	0.03%	99.95%
1A3biii	Road transport: Heavy duty vehicles and buses	1.97	0.01%	99.97%
1A3bii	Road transport: Light duty vehicles	1.89	0.01%	99.98%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	1.25	0.01%	99.99%
3F	Field burning of agricultural residues	1.00	0.01%	100.00%
1A3biv	Road transport: Mopeds & motorcycles	0.12	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.11	0.00%	100.00%
5C2	Open burning of waste	0.08	0.00%	100.00%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	0.04	0.00%	100.00%
2G	Other product use (please specify in the IIR)	0.01	0.00%	100.00%
	TOTAL	13.15	100.00%	

Table 77: NH₃ Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3B3	Manure management - Swine	1378.77	30.32%	30.32%
3B1a	Manure management - Dairy cattle	1074.13	23.62%	53.94%
3B1b	Manure management - Non-dairy cattle	387.28	8.52%	62.45%
3Da1	Inorganic N-fertilizers (includes also urea application)	336.64	7.40%	69.86%
3B4gi	Manure management - Laying hens	288.18	6.34%	76.19%
3B4gii	Manure management - Broilers	277.27	6.10%	82.29%
3B2	Manure management - Sheep	245.62	5.40%	87.69%
1A3bi	Road transport: Passenger cars	201.73	4.44%	92.13%
3B4d	Manure management - Goats	177.27	3.90%	96.02%
3B4f	Manure management - Mules and asses	76.72	1.69%	97.71%
3B4e	Manure management - Horses	57.25	1.26%	98.97%
5B1	Biological treatment of waste - Composting	18.71	0.41%	99.38%
1A4bi	Residential: Stationary	6.02	0.13%	99.51%
2G	Other product use (please specify in the IIR)	5.71	0.13%	99.64%
3F	Field burning of agricultural residues	4.81	0.11%	99.75%
3B4giii	Manure management - Turkeys	4.61	0.10%	99.85%
1A3bii	Road transport: Light duty vehicles	2.99	0.07%	99.91%
1A3biii	Road transport: Heavy duty vehicles and buses	1.38	0.03%	99.94%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	1.23	0.03%	99.97%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.90	0.02%	99.99%
1A3biv	Road transport: Mopeds & motorcycles	0.36	0.01%	100.00%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.06	0.00%	100.00%

Table 77: NH₃ Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	0.02	0.00%	100.00%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.00	0.00%	100.00%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.00	0.00%	100.00%
	TOTAL	4.55	100.00%	

Table 78: PM_{2.5} Level Assessment for 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	196.41	19.58%	19.58%
1A3ei	Pipeline transport	114.58	11.42%	31.01%
1A3bv	Road transport: Gasoline evaporation	110.46	11.01%	42.02%
1A4bii	Residential: Household and gardening (mobile)	81.55	8.13%	50.15%
1A3eii	Other (please specify in the IIR)	78.03	7.78%	57.93%
1B2aiv	Fugitive emissions oil: Refining / storage	69.59	6.94%	64.87%
1A3dii	National navigation (shipping)	56.39	5.62%	70.49%
2B3	Adipic acid production	55.33	5.52%	76.01%
3Da2b	Sewage sludge applied to soils	37.26	3.72%	79.72%
1A3aai(i)	Domestic aviation LTO (civil)	21.54	2.15%	81.87%
2B7	Soda ash production	16.90	1.68%	83.56%
1A5b	Other, Mobile (including military, land based and recreational boats)	16.38	1.63%	85.19%
1B2c	Venting and flaring (oil, gas, combined oil and gas)	13.55	1.35%	86.54%
3B4f	Manure management - Mules and asses	13.30	1.33%	87.87%
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	13.06	1.30%	89.17%
5C1bv	Cremation	11.85	1.18%	90.35%
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities	11.79	1.18%	91.53%
1A3bi	Road transport: Passenger cars	10.82	1.08%	92.61%
2C1	Iron and steel production	7.15	0.71%	93.32%
2A2	Lime production	7.10	0.71%	94.03%
5C1biv	Sewage sludge incineration	6.99	0.70%	94.72%
1A4ai	Commercial/institutional: Stationary	6.39	0.64%	95.36%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	6.25	0.62%	95.98%
1A3c	Railways	5.36	0.53%	96.52%
3Df	Use of pesticides	5.30	0.53%	97.05%
1A3bvi	Road transport: Automobile tyre and brake wear	4.43	0.44%	97.49%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.84	0.38%	97.87%

Table 78: PM_{2.5} Level Assessment for 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
2J	Production of POPs	3.02	0.30%	98.17%
3I	Agriculture other (please specify in the IIR)	2.98	0.30%	98.47%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	2.87	0.29%	98.75%
1A3bvii	Road transport: Automobile road abrasion	2.80	0.28%	99.03%
2C2	Ferroalloys production	2.51	0.25%	99.28%
2B5	Carbide production	2.33	0.23%	99.51%
5D2	Industrial wastewater handling	2.00	0.20%	99.71%
1A3ai(i)	International aviation LTO (civil)	0.84	0.08%	99.80%
1A3di(ii)	International inland waterways	0.50	0.05%	99.85%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.43	0.04%	99.89%
5C1bii	Hazardous waste incineration	0.17	0.02%	99.91%
5C1biii	Clinical waste incineration	0.17	0.02%	99.93%
1B2d	Other fugitive emissions from energy production	0.16	0.02%	99.94%
5C1bvi	Other waste incineration (please specify in the IIR)	0.16	0.02%	99.96%
5A	Biological treatment of waste - Solid waste disposal on land	0.15	0.01%	99.97%
5C1bi	Industrial waste incineration	0.11	0.01%	99.98%
2I	Wood processing	0.11	0.01%	99.99%
1A3biii	Road transport: Heavy duty vehicles and buses	0.07	0.01%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.00	0.00%	100.00%
	TOTAL	1.00	100.00%	

Table 79: PM₁₀ Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	294.61	17.11%	17.11%
1A3bvi	Road transport: Automobile tyre and brake wear	152.63	8.86%	25.97%
2A5a	Quarrying and mining of minerals other than coal	122.18	7.10%	33.07%
1A3bii	Road transport: Light duty vehicles	114.58	6.65%	39.72%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	110.46	6.41%	46.14%
3B4gii	Manure management - Broilers	89.87	5.22%	51.36%
5A	Biological treatment of waste - Solid waste disposal on land	88.26	5.13%	56.48%
2A1	Cement production	88.12	5.12%	61.60%
1A3biii	Road transport: Heavy duty vehicles and buses	78.03	4.53%	66.13%
2A5b	Construction and demolition	71.55	4.15%	70.28%
1A4bi	Residential: Stationary	71.31	4.14%	74.43%
3B3	Manure management - Swine	63.30	3.68%	78.10%
1A3bi	Road transport: Passenger cars	56.39	3.28%	81.38%
3Da1	Inorganic N-fertilizers (includes also urea application)	52.08	3.02%	84.40%
3B4gi	Manure management - Laying hens	38.85	2.26%	86.66%
2G	Other product use (please specify in the IIR)	37.36	2.17%	88.83%
2A5c	Storage, handling and transport of mineral products	25.08	1.46%	90.28%
2D3c	Asphalt roofing	22.63	1.31%	91.60%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	21.61	1.26%	92.85%
1A3dii	National navigation (shipping)	16.38	0.95%	93.80%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	13.55	0.79%	94.59%
1A4ci	Agriculture/Forestry/Fishing: Stationary	13.06	0.76%	95.35%
2A2	Lime production	11.65	0.68%	96.03%
3F	Field burning of agricultural residues	11.42	0.66%	96.69%

Table 79: PM₁₀ Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3B1a	Manure management - Dairy cattle	8.14	0.47%	97.16%
1A5b	Other, Mobile (including military, land based and recreational boats)	7.10	0.41%	97.57%
1A3biv	Road transport: Mopeds & motorcycles	6.39	0.37%	97.94%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	6.35	0.37%	98.31%
1A3ai(i)	International aviation LTO (civil)	5.36	0.31%	98.62%
3B1b	Manure management - Non-dairy cattle	4.51	0.26%	98.89%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	4.43	0.26%	99.14%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.84	0.22%	99.37%
5C2	Open burning of waste	3.09	0.18%	99.55%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	2.80	0.16%	99.71%
3B4giii	Manure management - Turkeys	1.17	0.07%	99.78%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.84	0.05%	99.83%
1A3aii(i)	Domestic aviation LTO (civil)	0.50	0.03%	99.85%
3B2	Manure management - Sheep	0.49	0.03%	99.88%
2D3b	Road paving with asphalt	0.45	0.03%	99.91%
5E	Other waste (please specify in IIR)	0.43	0.03%	99.93%
3B4d	Manure management - Goats	0.36	0.02%	99.95%
3B4e	Manure management - Horses	0.27	0.02%	99.97%
3B4f	Manure management - Mules and asses	0.26	0.02%	99.99%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.16	0.01%	100.00%
5C1bv	Cremation	0.08	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.00	0.00%	100.00%
	TOTAL	1.72	100.00%	

Table 80: TSP Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	392.81	16.45%	16.45%
2A5a	Quarrying and mining of minerals other than coal	235.40	9.86%	26.31%
1A3bvi	Road transport: Automobile tyre and brake wear	200.28	8.39%	34.70%
5A	Biological treatment of waste - Solid waste disposal on land	186.59	7.81%	42.51%
2A5b	Construction and demolition	142.74	5.98%	48.49%
3B3	Manure management - Swine	141.74	5.94%	54.43%
2D3c	Asphalt roofing	120.69	5.05%	59.48%
1A3bii	Road transport: Light duty vehicles	114.58	4.80%	64.28%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	110.46	4.63%	68.91%
3B4gii	Manure management - Broilers	89.87	3.76%	72.67%
2A1	Cement production	88.94	3.72%	76.40%
1A3biii	Road transport: Heavy duty vehicles and buses	78.03	3.27%	79.67%
1A4bi	Residential: Stationary	74.75	3.13%	82.80%
1A3bi	Road transport: Passenger cars	56.39	2.36%	85.16%
3Da1	Inorganic N-fertilizers (includes also urea application)	52.08	2.18%	87.34%
2A5c	Storage, handling and transport of mineral products	50.16	2.10%	89.44%
2G	Other product use (please specify in the IIR)	37.38	1.57%	91.01%
3B4gi	Manure management - Laying hens	32.78	1.37%	92.38%
2A2	Lime production	29.95	1.25%	93.63%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	21.78	0.91%	94.55%
3B1a	Manure management - Dairy cattle	17.76	0.74%	95.29%
1A3dii	National navigation (shipping)	16.38	0.69%	95.98%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	13.55	0.57%	96.54%
1A4ci	Agriculture/Forestry/Fishing: Stationary	13.06	0.55%	97.09%

Table 80: TSP Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3F	Field burning of agricultural residues	11.62	0.49%	97.58%
3B1b	Manure management - Non-dairy cattle	9.75	0.41%	97.99%
1A5b	Other, Mobile (including military, land based and recreational boats)	7.10	0.30%	98.28%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	6.58	0.28%	98.56%
1A3biv	Road transport: Mopeds & motorcycles	6.39	0.27%	98.83%
1A3ai(i)	International aviation LTO (civil)	5.36	0.22%	99.05%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	4.43	0.19%	99.24%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.84	0.16%	99.40%
5C2	Open burning of waste	3.17	0.13%	99.53%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	2.80	0.12%	99.65%
2D3b	Road paving with asphalt	1.96	0.08%	99.73%
3B2	Manure management - Sheep	1.22	0.05%	99.78%
3B4giii	Manure management - Turkeys	1.17	0.05%	99.83%
3B4d	Manure management - Goats	0.88	0.04%	99.87%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.84	0.04%	99.90%
3B4e	Manure management - Horses	0.59	0.02%	99.93%
3B4f	Manure management - Mules and asses	0.56	0.02%	99.95%
1A3aii(i)	Domestic aviation LTO (civil)	0.50	0.02%	99.97%
5E	Other waste (please specify in IIR)	0.43	0.02%	99.99%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.16	0.01%	100.00%
5C1bv	Cremation	0.11	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.00	0.00%	100.00%
	TOTAL	1.72	100.00%	

Table 81: BC Level Assessment for 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A3bii	Road transport: Light duty vehicles	76.23	28.04%	28.04%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	61.85	22.76%	50.80%
1A3biii	Road transport: Heavy duty vehicles and buses	47.30	17.40%	68.20%
1A3bi	Road transport: Passenger cars	35.84	13.19%	81.39%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	11.11	4.09%	85.48%
1A1a	Public electricity and heat production	11.00	4.05%	89.52%
1A4ci	Agriculture/Forestry/Fishing: Stationary	7.31	2.69%	92.21%
1A4bi	Residential: Stationary	6.87	2.53%	94.74%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	2.70	0.99%	95.73%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	2.20	0.81%	96.54%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	2.15	0.79%	97.33%
2A1	Cement production	1.66	0.61%	97.94%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	1.57	0.58%	98.52%
5C2	Open burning of waste	1.20	0.44%	98.96%
1A3biv	Road transport: Mopeds & motorcycles	1.16	0.43%	99.39%
3F	Field burning of agricultural residues	1.00	0.37%	99.76%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.47	0.17%	99.93%
2G	Other product use (please specify in the IIR)	0.17	0.06%	99.99%
2A2	Lime production	0.01	0.00%	100.00%
2D3b	Road paving with asphalt	0.01	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.00	0.00%	100.00%
2D3c	Asphalt roofing	0.00	0.00%	100.00%
	TOTAL	0.27	100.00%	

Table 82: CO Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A3bi	Road transport: Passenger cars	6740.02	46.83%	46.83%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	2420.68	16.82%	63.66%
1A3biv	Road transport: Mopeds & motorcycles	1391.44	9.67%	73.32%
1A3bii	Road transport: Light duty vehicles	1171.69	8.14%	81.47%
1A3biii	Road transport: Heavy duty vehicles and buses	742.29	5.16%	86.62%
1A4bi	Residential: Stationary	522.25	3.63%	90.25%
1A1a	Public electricity and heat production	427.38	2.97%	93.22%
1A3ai(i)	International aviation LTO (civil)	392.82	2.73%	95.95%
3F	Field burning of agricultural residues	133.61	0.93%	96.88%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	85.32	0.59%	97.47%
2G	Other product use (please specify in the IIR)	75.85	0.53%	98.00%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	73.70	0.51%	98.51%
1A3aii(i)	Domestic aviation LTO (civil)	60.42	0.42%	98.93%
1A4ci	Agriculture/Forestry/Fishing: Stationary	43.10	0.30%	99.23%
5C2	Open burning of waste	38.19	0.27%	99.50%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	24.21	0.17%	99.67%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	22.77	0.16%	99.82%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	12.66	0.09%	99.91%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	9.23	0.06%	99.98%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	2.78	0.02%	99.99%
2D3c	Asphalt roofing	0.72	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.01	0.00%	100.00%
	TOTAL	14.39	100.00%	

Table 83: Pb Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A3bi	Road transport: Passenger cars	13.69	56.58%	56.58%
1A3biii	Road transport: Heavy duty vehicles and buses	5.10	21.07%	77.65%
1A3bii	Road transport: Light duty vehicles	4.75	19.61%	97.26%
1A3bvi	Road transport: Automobile tyre and brake wear	0.21	0.87%	98.13%
1A3biv	Road transport: Mopeds & motorcycles	0.19	0.80%	98.93%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.16	0.66%	99.59%
1A1a	Public electricity and heat production	0.09	0.38%	99.97%
1A4bi	Residential: Stationary	0.00	0.01%	99.98%
2G	Other product use (please specify in the IIR)	0.00	0.01%	99.99%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.00	0.00%	99.99%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.00	0.00%	100.00%
5C2	Open burning of waste	0.00	0.00%	100.00%
3F	Field burning of agricultural residues	0.00	0.00%	100.00%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.00	0.00%	100.00%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.00	0.00%	100.00%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.00	0.00%	100.00%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.00	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.00	0.00%	100.00%
	TOTAL	24.21	100.00%	

Table 84: Cd Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A1a	Public electricity and heat production	0.024	48.78%	48.78%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.013	26.27%	75.04%
1A3bi	Road transport: Passenger cars	0.004	8.01%	83.05%
2G	Other product use (please specify in the IIR)	0.002	3.86%	86.91%
3F	Field burning of agricultural residues	0.002	3.53%	90.44%
1A4bi	Residential: Stationary	0.001	2.24%	92.68%
1A3bvi	Road transport: Automobile tyre and brake wear	0.001	1.95%	94.63%
1A3biii	Road transport: Heavy duty vehicles and buses	0.001	1.71%	96.35%
1A3bii	Road transport: Light duty vehicles	0.001	1.67%	98.02%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.000	0.86%	98.88%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.000	0.64%	99.53%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.000	0.16%	99.68%
5C2	Open burning of waste	0.000	0.14%	99.82%
1A3biv	Road transport: Mopeds & motorcycles	0.000	0.13%	99.95%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	0.000	0.04%	99.99%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.000	0.01%	100.00%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.000	0.00%	100.00%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.000	0.00%	100.00%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.000	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.000	0.00%	100.00%
	TOTAL	0.050	100.00%	

Table 85: Hg Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0804	90.84%	90.84%
1A1a	Public electricity and heat production	0.0071	8.05%	98.89%
1A4bi	Residential: Stationary	0.0004	0.48%	99.37%
3F	Field burning of agricultural residues	0.0003	0.32%	99.69%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0001	0.14%	99.83%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0001	0.09%	99.92%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0000	0.03%	99.95%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0000	0.03%	99.97%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.0000	0.02%	99.99%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0000	0.01%	100.00%
1A3bvi	Road transport: Automobile tyre and brake wear	0.0000	0.00%	100.00%
2G	Other product use (please specify in the IIR)	0.0000	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.00%	100.00%
	TOTAL	0.0885	100.00%	

Table 86: PCDD/F Level Assessment for the year 2015

NFR Code	Longname	Emissions (g I-TEQ)	Level Assessment	Cumulative Total
1A3bi	Road transport: Passenger cars	0.1082	27.38%	27.38%
1A1a	Public electricity and heat production	0.0873	22.09%	49.46%
1A4bi	Residential: Stationary	0.0873	22.08%	71.54%
1A3bii	Road transport: Light duty vehicles	0.0599	15.15%	86.69%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0256	6.47%	93.16%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0072	1.82%	94.98%
5C2	Open burning of waste	0.0068	1.73%	96.71%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0037	0.94%	97.65%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0034	0.87%	98.51%
1A3biv	Road transport: Mopeds & motorcycles	0.0032	0.80%	99.32%
3F	Field burning of agricultural residues	0.0013	0.32%	99.63%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0009	0.23%	99.87%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0003	0.07%	99.93%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.0002	0.05%	99.98%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0001	0.01%	100.00%
5E	Other waste (please specify in IIR)	0.0000	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.00%	100.00%
2G	Other product use (please specify in the IIR)	0.0000	0.00%	100.00%
	TOTAL	0.3952	100.00%	

Table 87: PAHs Level Assessment for the year 2015

NFR Code	Longname	Emissions (Mg)	Level Assessment	Cumulative Total
3F	Field burning of agricultural residues	0.0008	64.94%	64.94%
1A1a	Public electricity and heat production	0.0003	26.53%	91.46%
1A4bi	Residential: Stationary	0.0000	2.52%	93.99%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0000	1.56%	95.55%
1A3bi	Road transport: Passenger cars	0.0000	1.06%	96.61%
5C2	Open burning of waste	0.0000	0.71%	97.32%
1A3bii	Road transport: Light duty vehicles	0.0000	0.60%	97.92%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0000	0.60%	98.51%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0000	0.48%	99.00%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0000	0.32%	99.31%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.0000	0.23%	99.54%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0000	0.23%	99.77%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.0000	0.09%	99.86%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0000	0.07%	99.93%
2G	Other product use (please specify in the IIR)	0.0000	0.03%	99.95%
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	0.0000	0.02%	99.98%
1A3biv	Road transport: Mopeds & motorcycles	0.0000	0.02%	100.00%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0000	0.00%	100.00%
	TOTAL	0.0012	100.00%	

Table 88: HCB Level Assessment for the year 2015

NFR Code	Longname	Emissions (Kg)	Level Assessment	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.00755	89.42%	89.42%
1A4bi	Residential: Stationary	0.00043	5.10%	94.52%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.00017	1.97%	96.49%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.00012	1.44%	97.92%
1A3bi	Road transport: Passenger cars	0.00010	1.21%	99.14%
1A3bii	Road transport: Light duty vehicles	0.00005	0.57%	99.71%
1A3biii	Road transport: Heavy duty vehicles and buses	0.00002	0.25%	99.95%
1A3biv	Road transport: Mopeds & motorcycles	0.00000	0.04%	99.99%
1A1a	Public electricity and heat production	0.00000	0.01%	100.00%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.00000	0.00%	100.00%
	TOTAL	0.00840	100.00%	

Table 89: PCBs Level Assessment for the year 2015

NFR Code	Longname	Emissions (Kg)	Level Assessment	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0338	79.60%	79.60%
1A4bi	Residential: Stationary	0.0052	12.15%	91.76%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0020	4.69%	96.45%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0015	3.43%	99.87%
1A3bi	Road transport: Passenger cars	0.0000	0.09%	99.96%
1A3bii	Road transport: Light duty vehicles	0.0000	0.02%	99.98%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0000	0.01%	100.00%
1A3biv	Road transport: Mopeds & motorcycles	0.0000	0.00%	100.00%
1A1a	Public electricity and heat production	0.0000	0.00%	100.00%
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.0000	0.00%	100.00%
	TOTAL	0.0425	100.00%	

13. Annex 2: Level Assessment 1990-2014

Key Category Analysis

Level Assessment 1990-2014

Table 90: Key Category Analysis - Level Assessment for the year 1990

Comp.	Key categories (Sorted from high to low from left to right)										Total (%)
SO _x	1A1a (69.0%)	1A3bii (5.9%)	1A3biii (5.0%)	1A4bi (4.5%)							84.3
NO _x	1A1a (19.8%)	1A3biii (18.7%)	1A3bi (17.8%)	1A3bii (13.8%)	1A2f (10.0%)						80.2
NH ₃	3B3 (24.1%)	3Da1 (22.2%)	3B4gii (12.7%)	3B1a (12.4%)	3B4gi (5.9%)	3B1b (5.7%)					83.2
NMVOC	1A3bi (22.1%)	2D3d (13.2%)	1A3bv (11.8%)	1A3biv (10.8%)	1B2av (5.4%)	1A3bii (4.0%)	5A (4.0%)	1A3biii (3.4%)	1A1b (3.1%)	3B1a (3.1%)	81
CO	1A3bi (61.5%)	1A3bii (13.2%)	1A3biv (8.6%)								83.4
Pb	1A3bi (68.7%)	1A3bii (17.8%)									86.5
Hg	1A2f (65.8%)	5C1biii (19.8%)									85.6
Cd	3F (37.1%)	1A1a (33.1%)	1A2f (12.2%)								82.4
DIOX	5C1biii (82.1%)										82.1
PAH	3F (97.7%)										97.7
HCB	5C1biii (87.1%)										87.1

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 91: Key Category Analysis - Level Assessment for the year 1991

Comp.	Key categories (Sorted from high to low from left to right)										Total (%)
SO _x	1A1a (68.7%)	1A3bii (6.3%)	1A3biii (5.0%)	1A4bi (4.7%)							84.7
NO _x	1A1a (20.3%)	1A3biii (19.1%)	1A3bi (16.2%)	1A3bii (14.9%)	1A2f (9.3%)	3Da1 (3.5%)					83.4
NH ₃	3B3 (25.0%)	3Da1 (22.4%)	3B1a (12.8%)	3B4gii (11.6%)	3B4gi (5.8%)	3B1b (5.7%)					83.2
NMVOC	1A3bi (21.2%)	1A3bv (11.8%)	2D3d (11.3%)	1A3biv (10.9%)	1B2av (5.6%)	1A3bii (4.3%)	5A (4.3%)	1A1b (3.9%)	1A3biii (3.6%)	3B1a (3.3%)	80.2
CO	1A3bi (59.6%)	1A3bii (14.5%)	1A3biv (8.8%)								82.9
Pb	1A3bi (67.6%)	1A3bii (18.9%)									86.5
Hg	1A2f (63.9%)	5C1biii (21.0%)									85.0
Cd	3F (36.2%)	1A1a (34.6%)	1A2f (11.6%)								82.3
DIOX	5C1biii (82.7%)										82.7
PAH	3F (97.6%)										97.6
HCB	5C1biii (88.1%)										88.1

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 92: Key Category Analysis - Level Assessment for the year 1992

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (69.0%)	1A3bii (6.9%)	1A3biii (5.0%)	1A4bi (4.5%)								80.9
NO _x	1A1a (20.8%)	1A3biii (19.6%)	1A3bii (16.2%)	1A3bi (14.5%)	1A2f (8.9%)						80.0	
NH ₃	3B3 (26.5%)	3Da1 (24.8%)	3B4gii (12.0%)	3B1a (11.7%)	3B1b (5.0%)	3B1b (5.7%)					80.1	
NM VOC	1A3bi (20.5%)	2D3d (11.6%)	1A3bv (11.3%)	1A3biv (10.9%)	1B2av (5.8%)	1A3bii (4.5%)	5A (4.3%)	1A3biii (4.0%)	1A1b (3.5%)	3B1a (3.3%)	3B4gii (2.6%)	82.5
CO	1A3bi (57.7%)	1A3bii (15.2%)	1A3biv (8.8%)									81.7
Pb	1A3bi (66.0%)	1A3bii (20.1%)										86.1
Hg	1A2f (64.4%)	5C1biii (20.0%)										84.4
Cd	1A1a (36.7%)	3F (34.5%)	1A2f (11.4%)									82.7
DIOX	5C1biii (81.4%)											81.4
PAH	3F (97.5%)											97.5
HCB	5C1biii (87.6%)											87.6

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 93: Key Category Analysis - Level Assessment for the year 1993

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (70.2%)	1A3bii (6.8%)	1A4bi (4.7%)									81.7
NO _x	1A1a (21.9%)	1A3biii (18.9%)	1A3bii (16.3%)	1A3bi (13.9%)	1A2f (9.6%)							80.7
NH ₃	3B3 (25.9%)	3Da1 (21.0%)	3B4gii (14.0%)	3B1a (12.6%)	3B4gi (6.3%)	3B1b (5.6%)						85.4
NMVOG	1A3bi (19.7%)	2D3d (11.6%)	1A3bv (11.1%)	1A3biv (10.8%)	1B2av (5.8%)	5A (4.4%)	1A3bii (4.3%)	1A3biii (3.9%)	1A1b (3.8%)	3B1a (3.5%)	3B4gii (3.1%)	81.9
CO	1A3bi (56.9%)	1A3bii (15.1%)	1A3biv (8.9%)									80.9
Pb	1A3bi (66.1%)	1A3bii (20.3%)										86.4
Hg	1A2f (65.6%)	5C1biii (19.1%)										84.7
Cd	1A1a (39.4%)	3F (34.8%)	1A2f (12.6%)									86.8
DIOX	5C1biii (80.8%)											80.8
PAH	3F (97.3%)											97.3
HCB	5C1biii (86.8%)											86.8

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 94: Key Category Analysis - Level Assessment for the year 1994

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (69.0%)	1A3bii (7.5%)	1A4bi (5.0%)									81.5
NO _x	1A1a (21.6%)	1A3biii (19.3%)	1A3bii (17.6%)	1A3bi (13.2%)	1A2f (9.4%)							81.1
NH ₃	3B3 (25.5%)	3Da1 (20.5%)	3B1a (13.6%)	3B4gii (13.2%)	3B4gi (6.2%)	3B1b (5.8%)						84.9
NMVOC	1A3bi (18.9%)	2D3d (12.7%)	1A3bv (10.7%)	1A3biv (10.6%)	1B2av (5.8%)	5A (4.4%)	1A3bii (4.4%)	1A1b (4.2%)	1A3biii (4.0%)	3B1a (3.7%)	3B4gii (2.8%)	82.2
CO	1A3bi (56.3%)	1A3bii (15.7%)	1A3biv (9.0%)									81.0
Pb	1A3bi (64.7%)	1A3bii (21.4%)										86.1
Hg	1A2f (66.6%)	5C1biii (18.8%)										85.4
Cd	1A1a (42.0%)	3F (30.8%)	1A2f (13.5%)									86.3
DIOX	5C1biii (80.7%)											80.7
PAH	3F (96.9%)											96.9
HCB	5C1biii (86.7%)											86.7

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 95: Key Category Analysis - Level Assessment for the year 1995

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (67.7%)	1A3bii (7.9%)	1A4bi (5.2%)									80.8
NO _x	1A1a (20.8%)	1A3biii (18.7%)	1A3bii (17.6%)	1A3bi (13.5%)	1A2f (9.6%)							80.1
NH ₃	3B3 (25.6%)	3Da1 (19.1%)	3B1a (14.3%)	3B4gii (13.4%)	3B4gi (6.2%)	3B1b (6.0%)						84.5
NM VOC	1A3bi (18.7%)	1A3biv (11.0%)	1A3bv (10.8%)	2D3d (10.8%)	1B2av (6.2%)	5A (4.6%)	1A3bii (4.3%)	1A1b (4.0%)	3B1a (4.0%)	1A3biii (3.7%)	3B4gii (3.0%)	81.1
CO	1A3bi (56.1%)	1A3bii (15.4%)	1A3biv (9.4%)									80.9
Pb	1A3bi (65.8%)	1A3bii (21.1%)										86.9
Hg	1A2f (66.2%)	5C1biii (19.9%)										86.1
Cd	1A1a (40.0%)	3F (28.7%)	1A2f (13.4%)									82.1
DIOX	5C1biii (81.3%)											81.3
PAH	3F (96.7%)											96.7
HCB	5C1biii (87.3%)											87.3

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 96: Key Category Analysis - Level Assessment for the year 1996

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (68.3%)	1A3bii (7.8%)	1A4bi (5.1%)									81.3
NO _x	1A1a (21.4%)	1A3biii (18.8%)	1A3bii (17.4%)	1A3bi (12.9%)	1A2f (10.0%)							80.4
NH ₃	3B3 (25.7%)	3Da1 (19.5%)	3B4gii (13.9%)	3B1a (12.8%)	3B1b (6.4%)	3B4gi (6.2%)						84.5
NMVOC	1A3bi (18.2%)	1A3biv (11.0%)	2D3d (10.9%)	1A3bv (10.6%)	1B2av (6.3%)	5A (4.7%)	1A3bii (4.3%)	3B1a (3.8%)	1A1b (3.8%)	1A3biii (3.7%)	3B4gii (3.2%)	80.5
CO	1A3bi (55.4%)	1A3bii (15.2%)	1A3biv (9.7%)									80.3
Pb	1A3bi (65.1%)	1A3bii (21.5%)										86.6
Hg	1A2f (67.6%)	5C1biii (19.1%)										86.7
Cd	1A1a (41.9%)	3F (25.6%)	1A2f (14.3%)									81.8
DIOX	5C1biii (81.2%)											81.2
PAH	3F (96.3%)											96.3
HCB	5C1biii (86.7%)											86.7

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 97: Key Category Analysis - Level Assessment for the year 1997

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (68.6%)	1A3bii (7.8%)	1A4bi (5.1%)									81.5
NO _x	1A1a (22.3%)	1A3biii (19.0%)	1A3bii (17.4%)	1A3bi (12.5%)	1A2f (9.5%)						80.7	
NH ₃	3B3 (28.6%)	3Da1 (16.0%)	3B4gii (14.8%)	3B1a (12.2%)	3B4gi (6.0%)	3B1b (5.7%)						83.2
NMVOG	1A3bi (17.1%)	2D3d (11.9%)	1A3biv (10.5%)	1A3bv (10.2%)	1B2av (6.4%)	1A1b (5.1%)	5A (4.7%)	1A3bii (4.2%)	1A3biii (3.6%)	3B1a (3.5%)	3B4gii (3.3%)	80.5
CO	1A3bi (54.8%)	1A3bii (15.3%)	1A3biv (9.7%)	1A2f (6.2%)								85.9
Pb	1A3bi (64.5%)	1A3bii (21.8%)										86.4
Hg	1A2f (66.4%)	5C1biii (19.7%)										86.1
Cd	1A1a (44.0%)	3F (23.3%)	1A2f (13.6%)									80.9
DIOX	5C1biii (80.9%)											80.9
PAH	3F (95.8%)											95.8
HCb	5C1biii (87.2%)											87.2

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 98: Key Category Analysis - Level Assessment for the year 1998

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (69.7%)	1A3bii (7.8%)	1A4bi (5.0%)									82.5
NO _x	1A1a (23.9%)	1A3biii (18.9%)	1A3bii (17.6%)	1A3bi (11.8%)	1A2f (8.8%)							81.0
NH ₃	3B3 (30.1%)	3B4gii (14.9%)	3Da1 (13.7%)	3B1a (11.6%)	3B4gi (6.9%)	3B4d (5.6%)						82.9
NMVOG	1A3bi (16.4%)	2D3d (11.4%)	1A3bv (10.2%)	1A3biv (10.1%)	1B2av (6.8%)	1A1b (5.4%)	5A (5.0%)	1A3bii (4.3%)	1A3biii (3.7%)	3B4gii (3.4%)	3B1a (3.4%)	80.1
CO	1A3bi (53.8%)	1A3bii (15.4%)	1A3biv (9.8%)	1A2f (6.2%)								85.2
Pb	1A3bi (63.5%)	1A3bii (22.7%)										86.2
Hg	1A2f (64.5%)	5C1biii (20.5%)										84.9
Cd	1A1a (47.1%)	3F (21.3%)	1A2f (12.6%)									81
DIOX	5C1biii (80.5%)											80.5
PAH	3F (95.3%)											95.3
HCB	5C1biii (87.9%)											87.9

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 99: Key Category Analysis - Level Assessment for the year 1999

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)
SO _x	1A1a (70.2%)	1A3bii (7.7%)	1A4bi (5.0%)										82.9
NO _x	1A1a (24.6%)	1A3biii (18.7%)	1A3bii (17.6%)	1A3bi (11.3%)	1A2f (8.6%)							80.8	
NH ₃	3B3 (29.3%)	3B4gii (15.2%)	3Da1 (14.8%)	3B1a (11.8%)	3B4gi (5.9%)	3B4d (5.8%)						82.9	
NMVOG	1A3bi (15.8%)	2D3d (11.6%)	1A3bv (10.0%)	1A3biv (9.4%)	1B2av (7.1%)	1A1b (6.0%)	5A (5.1%)	1A3bii (4.3%)	1A3biii (3.6%)	3B4gii (3.5%)	3B1a (3.4%)	2H2 (2.5%)	82.2
CO	1A3bi (53.0%)	1A3bii (15.3%)	1A3biv (9.6%)	1A2f (6.5%)								84.4	
Pb	1A3bi (62.7%)	1A3bii (23.3%)										86.1	
Hg	1A2f (64.0%)	5C1biii (20.5%)										84.5	
Cd	1A1a (48.2%)	3F (18.7%)	1A2f (12.1%)	2G (8.7%)								87.8	
DIOX	5C1biii (80.1%)											80.1	
PAH	3F (94.6%)											94.6	
HCB	5C1biii (88.0%)											88	

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 100: Key Category Analysis - Level Assessment for the year 2000

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)	
SO _x	1A1a (68.3%)	1A3bii (8.1%)	1A4bi (5.9%)											82.3
NO _x	1A1a (24.3%)	1A3biii (20.0%)	1A3bii (18.4%)	1A3bi (10.5%)	1A2f (8.3%)									81.4
NH ₃	3B3 (29.1%)	3B4gii (15.7%)	3Da1 (14.8%)	3B1a (11.5%)	3B4d (6.4%)	3B1b (4.8%)								82.4
NMVOC	1A3bi (14.9%)	2D3d (12.8%)	1A3bv (9.7%)	1A3biv (8.7%)	1B2av (7.2%)	1A1b (5.5%)	5A (5.3%)	1A3bii (4.5%)	1A3biii (3.9%)	3B4gii (3.6%)	3B1a (3.4%)	2H2 (2.3%)		81.8
CO	1A3bi (51.3%)	1A3bii (15.7%)	1A3biv (9.2%)	1A2f (6.9%)										83.2
Pb	2D3b (36.2%)	1A1a (13.2%)	2A5a (10.8%)	1A3bii (5.3%)	2D3c (4.4%)	2A1 (3.6%)	3B4gii (2.9%)	2G (2.9%)	2A5b (2.8%)					82.1
Hg	1A1a (17.5%)	2D3b (15.6%)	1A3bii (9.9%)	2A5a (9.9%)	2A1 (6.1%)	3B4gii (5.3%)	2G (5.3%)	1A3biii (3.7%)	1A3bvi (2.9%)	1A2f (2.7%)	2A5b (2.6%)			81.6
Cd	1A1a (24.2%)	1A3bii (17.8%)	2G (9.6%)	2A1 (7.7%)	1A3biii (6.7%)	2D3b (6.6%)	1A2f (4.8%)	1A3bi (4.3%)						81.7
DIOX	1A3bi (59.2%)	1A3bii (25.6%)												84.8
PAH	1A2f (64.6%)	5C1biii (20.3%)												84.9
HCB	1A1a (47.2%)	2G (15.3%)	3F (13.9%)	1A2f (11.7%)										88.1
Comp. SO _x	5C1biii (79.4%)	1A3bii (6.1%)												85.5
NO _x	3F (93.0%)													93.0
	5C1biii (87.9%)													87.9

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 101: Key Category Analysis - Level Assessment for the year 2001

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)	
SO _x	1A1a (66.2%)	1A3bii (8.3%)	1A4bi (6.1%)											80.6
NO _x	1A1a (24.8%)	1A3biii (19.0%)	1A3bii (17.6%)	1A3bi (10.6%)	1A2f (8.4%)									80.4
NH ₃	3B3 (29.9%)	3Da1 (15.4%)	3B4gii (15.0%)	3B1a (11.4%)	3B4d (6.6%)	3B2 (4.8%)								83.0
NMVOG	1A3bi (14.9%)	2D3d (12.0%)	1A3bv (9.8%)	1A3biv (8.2%)	1B2av (7.8%)	1A1b (5.9%)	5A (5.6%)	1A3bii (4.3%)	3B4gii (3.7%)	3B1a (3.5%)	1A3biii (3.5%)	2H2 (2.3%)		81.3
CO	1A3bi (52.8%)	1A3bii (15.0%)	1A3biv (9.1%)	1A2f (7.1%)										84.0
TSP	2D3b (27.8%)	1A1a (15.4%)	2A5a (12.7%)	1A3bii (5.8%)	2D3c (4.3%)	2A1 (4.2%)	2A5b (4.1%)	3B4gii (3.4%)	5A (2.4%)					80.1
PM ₁₀	1A1a (19.3%)	2D3b (11.2%)	2A5a (10.9%)	1A3bii (10.2%)	2A1 (6.6%)	3B4gii (5.9%)	1A3biii (3.6%)	2A5b (3.6%)	1A3bvi (3.2%)	1A2f (3.0%)	1A3bi (2.7%)			80.1
PM _{2.5}	1A1a (26.9%)	1A3bii (18.5%)	2A1 (8.7%)	1A3biii (6.5%)	1A2f (5.4%)	1A3bi (4.9%)	2D3b (4.8%)	2G (3.3%)	1A3bvi (3.1%)					82.2
Pb	1A3bi (60.6%)	1A3bii (24.7%)												85.3
Hg	1A2f (64.2%)	5C1biii (20.8%)												85.0
Cd	1A1a (52.5%)	3F (15.5%)	1A2f (13.0%)											81.0
DIOX	5C1biii (79.7%)	1A3bi (5.8%)												85.5
PAH	3F (92.9%)													92.9
HCB	5C1biii (88.2%)													88.2

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 102: Key Category Analysis - Level Assessment for the year 2002

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)	
SO _x	1A1a (66.9%)	1A3bii (8.0%)	1A4bi (5.8%)											80.7
NO _x	1A1a (25.8%)	1A3biii (18.9%)	1A3bii (17.1%)	1A3bi (10.5%)	1A2f (8.6%)									80.9
NH ₃	3B3 (31.3%)	3B4gii (15.4%)	3Da1 (12.1%)	3B1a (12.1%)	3B4d (7.0%)	3B1b (4.7%)								82.6
NMVOC	2D3d (17.4%)	1A3bi (14.2%)	1A3bv (9.4%)	1B2av (7.8%)	1A3biv (6.4%)	5A (5.4%)	1A1b (5.2%)	1A3bii (3.8%)	3B4gii (3.6%)	3B1a (3.6%)	1A3biii (3.1%)	3B1b (2.2%)		82.1
CO	1A3bi (54.2%)	1A3bii (14.0%)	1A3biv (8.4%)	1A2f (7.5%)										84.1
TSP	2D3b (23.1%)	1A1a (16.3%)	2A5a (14.2%)	1A3bii (5.6%)	2D3c (4.7%)	2A5b (4.6%)	2A1 (4.6%)	3B4gii (3.6%)	5A (2.5%)	1A3bvi (2.5%)				81.6
PM ₁₀	1A1a (19.9%)	2A5a (11.9%)	1A3bii (9.6%)	2D3b (9.1%)	2A1 (7.0%)	3B4gii (6.1%)	2A5b (3.9%)	1A3biii (3.4%)	1A3bvi (3.2%)	1A2f (2.9%)	1A3bi (2.8%)	3B3 (2.3%)		82.0
PM _{2.5}	1A1a (28.1%)	1A3bii (17.6%)	2A1 (9.3%)	1A3biii (6.2%)	1A2f (5.4%)	1A3bi (5.1%)	2D3b (3.9%)	1A3bvi (3.2%)	2G (3.1%)					82.0
Pb	1A3bi (60.0%)	1A3bii (25.0%)												85.0
Hg	1A2f (64.4%)	5C1biii (20.6%)												85.0
Cd	1A1a (53.9%)	3F (14.4%)	1A2f (13.2%)											81.5
DIOX	5C1biii (79.9%)	1A3bi (5.9%)												85.7
PAH	3F (92.3%)													92.3
HCB	5C1biii (88.1%)													88.1

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 103: Key Category Analysis - Level Assessment for the year 2003

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)
SO _x	1A1a (70.3%)	1A3bii (7.1%)	1A4bi (5.3%)										82.7
NO _x	1A1a (27.2%)	1A3biii (19.7%)	1A3bii (16.4%)	1A3bi (10.5%)	1A2f (8.4%)								82.1
NH ₃	3B3 (32.1%)	3B4gii (15.7%)	3B1a (12.6%)	3Da1 (9.9%)	3B4d (6.8%)	3B1b (4.8%)							82.0
NMVOC	2D3d (20.5%)	1A3bi (13.6%)	1A3bv (9.2%)	1B2av (8.3%)	1A3biv (6.1%)	1A1b (5.3%)	5A (5.3%)	1A3bii (3.5%)	3B1a (3.5%)	3B4gii (3.4%)	1A3biii (2.9%)		81.6
CO	1A3bi (54.9%)	1A3bii (13.5%)	1A3biv (8.4%)	1A2f (7.3%)									84.1
TSP	1A1a (18.4%)	2A5a (15.8%)	2D3b (15.4%)	1A3bii (5.7%)	2A5b (5.5%)	2A1 (5.4%)	2D3c (4.7%)	3B4gii (3.7%)	1A3bvi (2.7%)	5A (2.7%)			80.0
PM ₁₀	1A1a (21.2%)	2A5a (12.5%)	1A3bii (9.1%)	2A1 (7.8%)	3B4gii (6.0%)	2D3b (5.7%)	2A5b (4.5%)	1A3biii (3.4%)	1A3bvi (3.4%)	1A2f (3.1%)	1A3bi (2.9%)	3Da1 (2.3%)	81.8
PM _{2.5}	1A1a (29.7%)	1A3bii (16.8%)	2A1 (10.1%)	1A3biii (6.2%)	1A2f (5.6%)	1A3bi (5.2%)	1A3bvi (3.3%)	3F (3.0%)	2D3b (2.4%)				82.4
Pb	1A3bi (59.9%)	1A3bii (24.3%)											84.1
Hg	1A2f (75.0%)	1A1a (15.6%)											90.7
Cd	1A1a (57.9%)	3F (15.4%)	1A2f (12.9%)										86.2
DIOX	5C1biii (48.2%)	1A3bi (15.7%)	1A3bii (14.0%)	1A1a (10.1%)									88.0
PAH	3F (92.4%)												92.4
HCB	5C1biii (64.4%)	1A2f (33.3%)											97.7

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 104: Key Category Analysis - Level Assessment for the year 2004

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)	
SO _x	1A1a (78.3%)	1A4bi (5.9%)											84.1
NO _x	1A1a (28.8%)	1A3biii (19.3%)	1A3bii (15.2%)	1A3bi (10.0%)	1A2f (9.2%)								82.6
NH ₃	3B3 (30.1%)	3B4gii (13.6%)	3B1a (12.5%)	3Da1 (11.5%)	3B4d (7.1%)	3B4gi (6.5%)							81.4
NMVOC	2D3d (25.9%)	1A3bi (12.8%)	1A3bv (9.2%)	1B2av (9.1%)	1A3biv (5.7%)	5A (5.5%)	3B1a (3.4%)	1A3bii (3.1%)	3B4gii (2.9%)	1A3biii (2.7%)			80.2
CO	1A3bi (55.3%)	1A3bii (12.4%)	1A3biv (8.2%)	1A2f (8.2%)									84.2
TSP	1A1a (19.9%)	2A5a (17.9%)	2D3b (9.6%)	2A5b (6.3%)	2A1 (5.9%)	2D3c (5.8%)	1A3bii (5.3%)	3B4gii (3.3%)	5A (2.9%)	1A3bvi (2.8%)	3B3 (2.4%)		82.2
PM ₁₀	1A1a (22.3%)	2A5a (13.8%)	2A1 (8.4%)	1A3bii (8.4%)	3B4gii (5.2%)	2A5b (5.0%)	2D3b (3.5%)	1A3bvi (3.4%)	1A2f (3.4%)	1A3biii (3.2%)	1A3bi (2.7%)	5A (2.1%)	81.5
PM _{2.5}	1A1a (31.3%)	1A3bii (15.4%)	2A1 (10.8%)	1A2f (6.2%)	1A3biii (5.9%)	1A3bi (5.0%)	1A3bvi (3.3%)	2G (3.3%)					81.2
Pb	1A3bi (50.1%)	1A3bii (29.5%)	1A3biii (17.7%)										97.3
Hg	1A2f (80.7%)												80.7
Cd	1A1a (60.0%)	1A2f (13.7%)	3F (12.0%)										85.7
DIOX	1A3bi (30.3%)	1A3bii (26.4%)	1A1a (21.2%)	1A4bi (10.3%)									88.1
PAH	3F (90.2%)												90.2
HCB	1A2f (94.5%)												94.5

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 105: Key Category Analysis - Level Assessment for the year 2005

Comp.	Key categories (Sorted from high to low from left to right)										Total (%)
SO _x	1A1a (90.0%)										90.0
NO _x	1A1a (30.4%)	1A3biii (19.3%)	1A3bii (14.5%)	1A3bi (9.3%)	1A2f (9.0%)						82.6
NH ₃	3B3 (30.2%)	3B4gii (14.1%)	3Da1 (12.4%)	3B1a (12.1%)	3B4d (6.4%)	3B4gi (5.3%)					80.5
NMVOC	2D3d (28.2%)	1A3bi (12.0%)	1B2av (9.8%)	1A3bv (9.4%)	1A3biv (5.7%)	5A (5.6%)	3B1a (3.3%)	1A3bii (3.0%)	3B4gii (3.0%)		80.0
CO	1A3bi (54.9%)	1A3bii (12.2%)	1A2f (8.4%)	1A3biv (8.4%)							83.8
TSP	1A1a (23.0%)	2A5a (20.2%)	2A5b (7.8%)	2A1 (6.7%)	1A3bii (5.5%)	2D3c (5.1%)	3B4gii (3.6%)	5A (3.2%)	1A3bvi (3.2%)	3B3 (2.6%)	80.9
PM ₁₀	1A1a (24.2%)	2A5a (14.6%)	2A1 (8.9%)	1A3bii (8.1%)	2A5b (5.8%)	3B4gii (5.3%)	1A2f (3.6%)	1A3bvi (3.6%)	1A3biii (3.2%)	1A3bi (2.8%)	80.1
PM _{2.5}	1A1a (33.4%)	1A3bii (14.6%)	2A1 (11.1%)	1A2f (6.4%)	1A3biii (5.8%)	1A3bi (5.1%)	1A3bvi (3.4%)	2G (2.9%)			82.8
Pb	1A3bi (43.0%)	1A3bii (33.0%)	1A3biii (21.2%)								97.2
Hg	1A2f (79.8%)	1A1a (17.6%)									97.4
Cd	1A1a (63.2%)	1A2f (13.3%)	3F (9.2%)								85.7
DIOX	1A3bi (28.8%)	1A3bii (25.3%)	1A1a (22.3%)	1A4bi (11.4%)							87.7
PAH	3F (87.3%)										87.3
HCB	1A2f (91.6%)										91.6

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 106: Key Category Analysis - Level Assessment for the year 2006

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (87.4%)											87.4
NO _x	1A1a (31.6%)	1A3biii (18.7%)	1A3bii (13.4%)	1A2f (9.4%)	1A3bi (9.0%)							82.1
NH ₃	3B3 (32.3%)	3B1a (12.2%)	3B4gii (12.1%)	3Da1 (11.7%)	3B4d (6.5%)	3B4gi (5.5%)						80.3
NMVOC	2D3d (31.6%)	1A3bi (12.0%)	1A3bv (9.9%)	1B2av (6.8%)	5A (6.1%)	1A3biv (4.4%)	3B1a (3.4%)	1A3bii (2.7%)	1A3biii (2.7%)	3B4gii (2.6%)		82.3
CO	1A3bi (56.0%)	1A3bii (11.2%)	1A2f (9.4%)	1A3biv (6.9%)								83.6
TSP	1A1a (22.5%)	2A5a (18.8%)	2A5b (8.6%)	2A1 (7.1%)	1A3bii (5.4%)	2D3c (5.0%)	5A (3.5%)	1A3bvi (3.4%)	3B4gii (3.2%)	3B3 (2.9%)		80.6
PM ₁₀	1A1a (24.1%)	2A5a (14.2%)	2A1 (9.3%)	1A3bii (7.9%)	2A5b (6.3%)	3B4gii (4.7%)	1A3bvi (3.8%)	1A2f (3.6%)	1A3biii (3.2%)	1A3bi (2.9%)	5A (2.4%)	82.3
PM _{2.5}	1A1a (33.3%)	1A3bii (14.2%)	2A1 (11.7%)	1A2f (6.4%)	1A3biii (5.8%)	1A3bi (5.1%)	1A3bvi (3.7%)					80.2
Pb	1A3bi (45.5%)	1A3bii (30.9%)	1A3biii (20.8%)									97.3
Hg	1A2f (81.7%)											81.7
Cd	1A1a (63.4%)	1A2f (15.0%)	3F (7.6%)									85.9
DIOX	1A3bi (28.8%)	1A3bii (24.1%)	1A1a (23.6%)	1A4bi (10.7%)								87.2
PAH	3F (83.7%)											83.7
HCB	1A2f (90.5%)											90.5

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 107: Key Category Analysis - Level Assessment for the year 2007

Comp.	Key categories (Sorted from high to low from left to right)										Total (%)
SO _x	1A1a (86.7%)										86.7
NO _x	1A1a (32.8%)	1A3biii (19.2%)	1A3bii (12.3%)	1A2f (9.2%)	1A3bi (8.9%)						82.3
NH ₃	3B3 (32.7%)	3B4gii (13.3%)	3B1a (12.1%)	3Da1 (11.1%)	3B4d (6.5%)	1A3bi (5.3%)					81.0
NMVOC	2D3d (32.8%)	1A3bi (11.3%)	1A3bv (10.1%)	1B2av (7.2%)	5A (6.1%)	1A3biv (4.8%)	3B1a (3.2%)	3B4gii (2.8%)	1A3bii (2.5%)		80.7
CO	1A3bi (54.5%)	1A3bii (11.3%)	1A2f (9.6%)	1A3biv (7.9%)							83.2
TSP	1A1a (23.0%)	2A5a (18.3%)	2A5b (8.9%)	2A1 (7.5%)	1A3bii (4.8%)	2D3c (4.6%)	5A (3.6%)	1A3bvi (3.6%)	3B4gii (3.5%)	3B3 (2.9%)	80.7
PM ₁₀	1A1a (24.6%)	2A5a (13.8%)	2A1 (9.8%)	1A3bii (7.0%)	2A5b (6.5%)	3B4gii (5.1%)	1A3bvi (4.0%)	1A2f (3.6%)	1A3biii (3.1%)	1A3bi (2.9%)	80.2
PM _{2.5}	1A1a (33.7%)	1A3bii (12.6%)	2A1 (12.1%)	1A2f (6.5%)	1A3biii (5.5%)	1A3bi (5.1%)	1A3bvi (3.8%)	2A5a (2.8%)			82.1
Pb	1A3bi (47.4%)	1A3bii (28.4%)	1A3biii (21.6%)								97.3
Hg	1A2f (81.5%)										81.5
Cd	1A1a (65.4%)	1A2f (14.7%)									80.1
DIOX	1A3bi (27.9%)	1A1a (23.0%)	1A3bii (21.7%)	1A4bi (14.6%)							87.2
PAH	3F (73.0%)	1A1a (20.8%)									93.9
HCB	1A2f (86.6%)										86.6

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 108: Key Category Analysis - Level Assessment for the year 2008

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (91.5%)											91.5
NO _x	1A1a (31.2%)	1A3biii (21.2%)	1A3bii (12.0%)	1A2f (10.5%)	1A3bi (9.2%)							84.0
NH ₃	3B3 (33.1%)	3B4gii (13.2%)	3B1a (12.5%)	3Da1 (8.9%)	3B4d (6.8%)	3B1b (5.4%)						80.1
NMVOG	2D3d (27.6%)	1A3bi (11.3%)	1A3bv (10.8%)	1B2av (9.0%)	5A (6.8%)	1A3biv (4.8%)	3B1a (3.5%)	3B4gii (2.9%)	1A3biii (2.6%)	2D3h (2.5%)		81.8
CO	1A3bi (54.7%)	1A3bii (10.9%)	1A2f (10.6%)	1A3biv (8.2%)								84.4
TSP	2A5a (20.3%)	1A1a (13.7%)	2A5b (10.4%)	2A1 (8.6%)	2D3c (5.0%)	1A3bii (4.9%)	5A (4.3%)	1A3bvi (4.2%)	3B4gii (3.9%)	3B3 (3.3%)	2A5c (3.2%)	81.7
PM ₁₀	2A5a (15.4%)	1A1a (15.1%)	2A1 (11.3%)	2A5b (7.6%)	1A3bii (7.2%)	3B4gii (5.7%)	1A3bvi (4.7%)	1A2f (4.6%)	1A3biii (3.5%)	1A3bi (3.2%)	5A (3.0%)	81.3
PM _{2.5}	1A1a (19.7%)	2A1 (15.5%)	1A3bii (14.2%)	1A2f (8.9%)	1A3biii (6.8%)	1A3bi (6.3%)	1A3bvi (4.9%)	2A5a (3.6%)	1A4bi (2.6%)			82.5
Pb	1A3bi (48.6%)	1A3bii (26.2%)	1A3biii (22.5%)									97.3
Hg	1A2f (81.3%)											81.3
Cd	1A1a (67.9%)	1A2f (15.0%)										82.9
DIOX	1A3bi (28.5%)	1A1a (24.3%)	1A3bii (21.0%)	1A4bi (14.0%)								87.7
PAH	3F (61.4%)	1A1a (30.7%)										92.1
HCb	1A2f (90.9%)											90.9

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 109: Key Category Analysis - Level Assessment for the year 2009

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)
SO _x	1A1a (90.6%)											90.6
NO _x	1A1a (37.0%)	1A3biii (19.8%)	1A3bii (11.0%)	1A2f (9.0%)	1A3bi (8.6%)							85.4
NH ₃	3B3 (37.8%)	3B1a (14.2%)	3Da1 (8.0%)	3B1b (7.4%)	3B4gii (6.8%)	3B4gi (6.5%)						80.6
NMVOG	2D3d (29.2%)	1A3bv (11.8%)	1A3bi (11.2%)	1B2av (10.4%)	5A (7.8%)	1A3biv (4.9%)	1A3biii (2.5%)	3B4gii (2.4%)				80.2
CO	1A3bi (53.9%)	1A3bii (10.7%)	1A2f (9.7%)	1A3biv (8.7%)								83.0
TSP	2A5a (17.7%)	1A1a (13.6%)	2A5b (10.3%)	2D3c (9.8%)	2A1 (7.9%)	5A (5.0%)	1A3bii (5.0%)	1A3bvi (4.9%)	3B3 (3.9%)	1A2f (3.2%)		81.2
PM ₁₀	1A1a (15.6%)	2A5a (14.1%)	2A1 (10.9%)	2A5b (7.9%)	1A3bii (7.7%)	1A3bvi (5.7%)	1A2f (4.9%)	1A3biii (3.7%)	5A (3.7%)	1A3bi (3.6%)	3B4gii (3.4%)	81.0
PM _{2.5}	1A1a (19.8%)	1A3bii (14.6%)	2A1 (13.6%)	1A2f (9.3%)	1A3biii (7.1%)	1A3bi (6.9%)	1A3bvi (5.8%)	2A5a (3.3%)				80.3
Pb	1A3bi (50.9%)	1A3bii (24.8%)	1A3biii (21.7%)									97.4
Hg	1A2f (80.2%)											80.2
Cd	1A1a (67.2%)	1A2f (14.0%)										81.2
DIOX	1A3bi (30.6%)	1A1a (24.5%)	1A3bii (21.3%)	1A4bi (11.1%)								87.5
PAH	3F (57.7%)	1A1a (34.2%)										91.9
HCB	1A2f (90.7%)											90.7

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 110: Key Category Analysis - Level Assessment for the year 2010

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)
SO _x	1A1a (92.8%)												92.8
NO _x	1A1a (33.9%)	1A3biii (21.0%)	1A3bii (11.8%)	1A3bi (9.1%)	1A2f (8.5%)							84.2	
NH ₃	3B3 (37.2%)	3B1a (14.0%)	3Da1 (9.8%)	3B1b (7.3%)	3B4gii (6.8%)	3B4gi (5.8%)						80.9	
NMVOG	2D3d (32.2%)	1A3bv (11.5%)	1A3bi (10.2%)	1B2av (10.1%)	5A (7.0%)	1A3biv (4.4%)	3B4gii (2.5%)	1A3bii (2.3%)				80.2	
CO	1A3bi (53.3%)	1A3bii (11.5%)	1A3biv (8.8%)	1A2f (8.6%)								82.1	
TSP	2A5a (17.1%)	2D3c (13.2%)	1A1a (12.1%)	2A5b (9.6%)	2A1 (7.6%)	1A3bvi (5.0%)	1A3bii (4.8%)	5A (4.6%)	3B3 (3.9%)	2A5c (3.3%)			81.3
PM ₁₀	1A1a (14.4%)	2A5a (14.0%)	2A1 (10.8%)	1A3bii (7.6%)	2A5b (7.6%)	1A3bvi (6.1%)	1A2f (4.4%)	2D3c (3.9%)	1A3bi (3.6%)	1A3biii (3.6%)	3B4gii (3.6%)	5A (3.4%)	82.9
PM _{2.5}	1A1a (18.4%)	1A3bii (14.7%)	2A1 (13.9%)	1A2f (8.5%)	1A3bi (7.0%)	1A3biii (6.9%)	1A3bvi (6.2%)	2G (3.6%)	2A5a (3.5%)				82.8
Pb	1A3bi (51.4%)	1A3bii (24.9%)	1A3biii (21.5%)										97.7
Hg	1A2f (82.7%)												82.7
Cd	1A1a (58.8%)	1A2f (15.4%)	1A3bi (8.1%)										82.4
DIOX	1A3bi (31.3%)	1A1a (22.8%)	1A3bii (22.5%)	1A4bi (9.9%)								86.5	
PAH	3F (61.0%)	1A1a (31.0%)											92.0
HCB	1A2f (87.4%)												87.4

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 111: Key Category Analysis - Level Assessment for the year 2011

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)	
SO _x	1A1a (92.6%)											92.6	
NO _x	1A1a (45.2%)	1A3biii (17.9%)	1A3bii (9.2%)	1A3bi (7.3%)	1A2f (6.8%)							86.4	
NH ₃	3B3 (35.6%)	3B1a (15.2%)	3B1b (8.1%)	3Da1 (7.6%)	3B4gii (6.8%)	3B4gi (6.6%)	3B2 (6.1%)					86.0	
NMVOG	2D3d (18.1%)	1A3bv (14.3%)	1B2av (12.4%)	1A3bi (11.1%)	5A (8.3%)	1A3biv (5.2%)	2D3h (3.8%)	3B4gii (2.9%)	1A3biii (2.6%)	1A3bii (2.5%)			81.2
CO	1A3bi (52.7%)	1A3bii (11.0%)	1A3biv (9.5%)	1A2f (9.3%)								82.5	
TSP	2A5a (15.9%)	2D3c (14.3%)	1A1a (13.4%)	2A5b (8.2%)	2A1 (7.1%)	1A3bvi (5.4%)	5A (4.8%)	1A3bii (4.6%)	3B3 (4.0%)	2A5c (3.4%)			81.2
PM ₁₀	1A1a (15.9%)	2A5a (13.1%)	2A1 (10.1%)	1A3bii (7.3%)	1A3bvi (6.6%)	2A5b (6.5%)	2D3c (4.2%)	3B4gii (3.8%)	1A3biii (3.7%)	1A3bi (3.7%)	5A (3.6%)	1A2f (3.4%)	81.9
PM _{2.5}	1A1a (20.7%)	1A3bii (14.2%)	2A1 (11.3%)	1A3biii (7.3%)	1A3bi (7.3%)	1A3bvi (6.8%)	1A2f (6.6%)	2A5a (3.5%)	2G (3.3%)				81.2
Pb	1A3bi (52.4%)	1A3bii (23.2%)	1A3biii (21.9%)										97.6
Hg	1A2f (76.2%)	1A1a (22.2%)											98.4
Cd	1A1a (66.6%)	1A2f (12.5%)	1A3bi (6.8%)										86.0
DIOX	1A3bi (31.0%)	1A1a (24.6%)	1A3bii (20.7%)	1A4bi (10.3%)								86.6	
PAH	3F (63.1%)	1A1a (29.7%)											92.8
HCB	1A2f (80.6%)											80.6	

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 112: Key Category Analysis - Level Assessment for the year 2012

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)	
SO _x	1A1a (90.9%)											90.9	
NO _x	1A1a (50.7%)	1A3biii (16.7%)	1A3bii (7.2%)	1A3bi (6.7%)								81.2	
NH ₃	3B3 (33.5%)	3B1a (15.8%)	3Da1 (8.5%)	3B1b (8.4%)	3B4gi (7.5%)	3B4gii (6.5%)						80.2	
NMVOG	2D3d (19.5%)	1A3bv (14.1%)	1B2av (11.8%)	1A3bi (10.2%)	5A (8.4%)	1A3biv (5.5%)	1A1a (3.4%)	2D3h (3.1%)	3B4gii (2.8%)	1A3biii (2.5%)		81.3	
CO	1A3bi (52.1%)	1A3biv (9.7%)	1A2f (9.2%)	1A3bii (9.2%)								80.2	
TSP	1A1a (17.1%)	2D3c (14.3%)	2A5a (12.3%)	2A5b (7.0%)	1A3bvi (6.5%)	5A (6.0%)	3B3 (4.6%)	1A3bii (4.4%)	2A1 (3.3%)	3B4gii (2.8%)	1A3biii (2.8%)	81.2	
PM ₁₀	1A1a (19.8%)	2A5a (9.8%)	1A3bvi (7.6%)	1A3bii (6.7%)	2A5b (5.4%)	2A1 (5.1%)	5A (4.4%)	3B4gii (4.3%)	1A3biii (4.3%)	2D3c (4.1%)	1A2f (3.4%)	81.2	
	3B3 (3.2%)	1A3bi (2.9%)											
PM _{2.5}	1A1a (24.4%)	1A3bii (12.5%)	1A3biii (8.1%)	1A3bvi (7.5%)	1A2f (6.4%)	2A1 (5.9%)	1A3bi (5.5%)	1A4bi (5.2%)	2G (4.3%)	2A5a (2.5%)		82.2	
Pb	1A3bi (54.0%)	1A3biii (22.5%)	1A3bii (20.8%)									97.3	
Hg	1A2f (69.0%)	1A1a (29.5%)											98.5
Cd	1A1a (70.1%)	1A2f (10.4%)											80.5
DIOX	1A3bi (28.6%)	1A1a (22.3%)	1A4bi (19.0%)	1A3bii (17.0%)								86.9	
PAH	3F (66.8%)	1A1a (25.5%)											92.3
HCB	1A2f (67.9%)	1A1a (18.3%)											86.2

ColorCodes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 113: Key Category Analysis - Level Assessment for the year 2013

Comp.	Key categories (Sorted from high to low from left to right)												Total (%)
SO _x	1A1a (87.9%)												87.9
NO _x	1A1a (38.5%)	1A3biii (18.0%)	1A2f (11.5%)	1A3bii (7.9%)	1A3bi (7.8%)								83.7
NH ₃	3B3 (33.4%)	3B1a (16.9%)	3B1b (8.7%)	3Da1 (8.6%)	3B4gi (7.7%)	3B4gii (5.9%)							81.2
NMVOC	2D3d (19.4%)	1A3bv (16.0%)	1B2av (11.6%)	1A3bi (10.1%)	5A (9.0%)	1A3biv (5.7%)	2D3a (2.8%)	2D3h (2.8%)	3B4gii (2.7%)				80.1
CO	1A3bi (49.4%)	1A2f (14.4%)	1A3biv (9.8%)	1A3bii (8.4%)									82.0
TSP	1A1a (16.4%)	2A5a (10.1%)	2D3c (9.8%)	1A3bvi (7.5%)	5A (7.4%)	2A5b (6.4%)	3B3 (5.7%)	1A3bii (4.5%)	1A2f (3.8%)	2A1 (3.6%)	3B4gii (3.2%)	1A3biii (2.9%)	81.4
PM ₁₀	1A1a (17.9%)	1A3bvi (8.3%)	2A5a (7.7%)	1A3bii (6.5%)	1A2f (5.6%)	2A1 (5.2%)	5A (5.0%)	2A5b (4.6%)	3B4gii (4.6%)	1A3biii (4.3%)	3B3 (3.7%)	1A3bi (3.1%)	82.1
	1A4bi (2.9%)	2D3c (2.7%)											
PM _{2.5}	1A1a (20.9%)	1A3bii (11.5%)	1A2f (9.8%)	1A3bvi (7.8%)	1A3biii (7.5%)	2A1 (5.7%)	1A3bi (5.4%)	1A4bi (5.0%)	2G (3.9%)	1A3dii (2.2%)	2A5a (1.9%)		81.7
Pb	1A3bi (56.7%)	1A3biii (20.9%)	1A3bii (19.8%)										97.4
Hg	1A2f (89.3%)												89.3
Cd	1A1a (49.9%)	1A2f (23.6%)	1A3bi (8.4%)										81.9
DIOX	1B2c (35.0%)	1A3bi (19.9%)	1A4bi (12.5%)	1A1a (11.9%)	1A3bii (11.0%)							90.3	
PAH	3F (68.4%)	1A1a (22.9%)											91.4
HCB	1A2f (87.6%)												87.6

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

Table 114: Key Category Analysis - Level Assessment for the year 2014

Comp.	Key categories (Sorted from high to low from left to right)											Total (%)	
SO _x	1A1a (88.8%)											88.8	
NO _x	1A1a (39.7%)	1A3biii (16.8%)	1A2f (13.5%)	1A3bi (7.3%)	1A3bii (7.3%)							84.6	
NH ₃	3B3 (31.8%)	3B1a (17.9%)	3B1b (9.4%)	3B4gii (7.6%)	3B4gi (7.4%)	3Da1 (7.2%)						81.4	
NMVOC	2D3d (17.7%)	1A3bv (16.7%)	1B2av (11.2%)	1A3bi (9.7%)	5A (8.8%)	1A3biv (5.7%)	2D3h (3.6%)	3B4gii (3.6%)	2D3a (2.9%)	3B1a (2.9%)			82.7
CO	1A3bi (46.2%)	1A2f (18.4%)	1A3biv (9.5%)	1A3bii (8.0%)								82.2	
TSP	1A1a (16.5%)	2A5a (10.1%)	1A3bvi (8.6%)	5A (7.9%)	3B3 (6.0%)	2A5b (5.5%)	1A2f (5.4%)	2D3c (5.2%)	1A3bii (4.9%)	3B4gii (4.6%)	2A1 (3.6%)	1A3biii (3.4%)	81.6
PM ₁₀	1A1a (17.2%)	1A3bvi (9.1%)	1A2f (7.5%)	2A5a (7.3%)	1A3bii (6.8%)	3B4gii (6.3%)	5A (5.2%)	2A1 (4.9%)	1A3biii (4.6%)	2A5b (3.8%)	3B3 (3.7%)	1A3bi (3.4%)	82.5
	1A4bi (2.7%)												
PM _{2.5}	1A1a (19.9%)	1A2f (13.0%)	1A3bii (11.8%)	1A3bvi (8.4%)	1A3biii (8.1%)	1A3bi (5.8%)	2A1 (5.3%)	1A4bi (4.6%)	1A2e (2.2%)	1A3dii (1.8%)			81.0
Pb	1A3bi (56.5%)	1A3biii (21.1%)	1A3bii (19.6%)									97.2	
Hg	1A2f (91.9%)											91.9	
Cd	1A1a (48.8%)	1A2f (29.7%)	1A3bi (8.2%)									86.7	
DIOX	1A3bi (30.0%)	1A1a (22.4%)	1A3bii (16.6%)	1A4bi (16.3%)								85.3	
PAH	3F (60.4%)	1A1a (30.1%)										90.5	
HCB	1A2f (92.0%)											92.0	

Color Codes

A_PublicPower	
B_Industry	
C_OtherStationaryComb	
D_Fugitive	
E_Solvents	
F_RoadTransport	
H_Aviation	

G_Shipping	
I_Offroad	
J_Waste	
K_AgriLivestock	
L_AgriOther	
M_Other	

14. Annex 3: Trend Assessment 2015

Annex 3

Key Category Analysis

Trend Assessment 2015

Table 115: NOx Trend Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A1a	Public electricity and heat production	3212.86	4844.57	0.089682	23.49%	23.49%
1A3bi	Road transport: Passenger cars	2878.63	1358.36	0.083955	21.99%	45.49%
1A3bii	Road transport: Light duty vehicles	2232.09	1271.13	0.051640	13.53%	59.02%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	1621.35	2138.04	0.026308	6.89%	65.91%
1A2gviii	Stationary combustion in manufacturing industries and construction	494.02	71.75	0.024377	6.39%	72.30%
3Da1	Inorganic N-fertilizers (includes also urea application)	565.71	165.69	0.022754	5.96%	78.26%
1A2gvii	Mobile Combustion in manufacturing industries and construction	405.96	69.63	0.019373	5.08%	83.33%
1A3ai(i)	International aviation LTO (civil)	376.35	666.96	0.016650	4.36%	87.69%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	231.98	467.57	0.013752	3.60%	91.30%
1A3biii	Road transport: Heavy duty vehicles and buses	3030.37	3016.84	0.009654	2.53%	93.83%
1A3dii	National navigation (shipping)	37.38	128.51	0.005501	1.44%	95.27%
3F	Field burning of agricultural residues	79.35	4.61	0.004343	1.14%	96.40%
1A4ci	Agriculture/Forestry/Fishing: Stationary	264.43	335.03	0.003446	0.90%	97.31%

Table 115: NOx Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	215.71	273.30	0.002811	0.74%	98.04%
1A5b	Other, Mobile (including military, land based and recreational boats)	8.12	47.79	0.002423	0.63%	98.68%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	27.92	44.15	0.000906	0.24%	98.92%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	81.62	98.42	0.000755	0.20%	99.11%
1A3a(ii)	Domestic aviation LTO (civil)	13.65	26.16	0.000726	0.19%	99.30%
1A3biv	Road transport: Mopeds & motorcycles	29.12	40.17	0.000582	0.15%	99.46%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	13.96	21.63	0.000426	0.11%	99.57%
3B3	Manure management - Swine	0.37	7.00	0.000408	0.11%	99.67%
2G	Other product use	6.90	2.48	0.000249	0.07%	99.74%
3B1b	Manure management - Non-dairy cattle	4.65	1.24	0.000194	0.05%	99.79%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	2.36	0.11	0.000131	0.03%	99.82%
3B1a	Manure management - Dairy cattle	5.29	3.23	0.000109	0.03%	99.85%
1A4bi	Residential: Stationary	159.05	166.31	0.000102	0.03%	99.88%
3B4gi	Manure management - Laying hens	2.95	1.16	0.000100	0.03%	99.91%

Table 115: NOx Trend Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3B4gii	Manure management - Broilers	4.59	3.22	0.000069	0.02%	99.92%
3B4f	Manure management - Mules and asses	1.35	0.35	0.000057	0.01%	99.94%
3B2	Manure management - Sheep	1.50	0.53	0.000055	0.01%	99.95%
3B4e	Manure management - Horses	1.10	0.26	0.000048	0.01%	99.97%
3B4d	Manure management - Goats	1.07	0.38	0.000039	0.01%	99.98%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	1.92	1.24	0.000035	0.01%	99.99%
5C2	Open burning of waste	1.55	2.18	0.000033	0.01%	99.99%
3B4giii	Manure management - Turkeys	0.41	0.05	0.000021	0.01%	100.00%

Table 116: NMVOC Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3bi	Road transport: Passenger cars	2904.50	653.91	0.074497	28.66%	28.66%
2D3d	Coating applications	1738.74	1617.35	0.048708	18.74%	47.39%
1A3biv	Road transport: Mopeds & motorcycles	1420.11	388.46	0.031192	12.00%	59.39%
1A3bv	Road transport: Gasoline evaporation	1554.85	1181.58	0.023409	9.00%	68.40%
1B2av	Distribution of oil products	715.88	782.18	0.018811	7.24%	75.64%
1A3bii	Road transport: Light duty vehicles	529.34	120.26	0.013494	5.19%	80.83%
5A	Biological treatment of waste - Solid waste disposal on land	527.28	628.68	0.009855	3.79%	84.62%
1A3biii	Road transport: Heavy duty vehicles and buses	443.21	163.59	0.006512	2.50%	87.12%
2D3f	Dry cleaning	200.15	52.67	0.004554	1.75%	88.87%
2D3h	Printing	200.00	247.20	0.003073	1.18%	90.06%
3B4d	Manure management - Goats	87.36	10.46	0.002941	1.13%	91.19%
3B4gii	Manure management - Broilers	323.23	216.09	0.002617	1.01%	92.19%
3B1b	Manure management - Non-dairy cattle	287.28	128.27	0.002528	0.97%	93.17%
1A4bi	Residential: Stationary	61.27	53.77	0.001471	0.57%	93.73%

Table 116: NMVOC Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3B1a	Manure management - Dairy cattle	401.99	207.67	0.001393	0.54%	94.27%
1A2gvii	Mobile Combustion in manufacturing industries and construction	41.91	7.19	0.001246	0.48%	94.75%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	39.78	37.62	0.001162	0.45%	95.20%
3B4gi	Manure management - Laying hens	105.75	44.56	0.001133	0.44%	95.63%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	11.30	29.96	0.001043	0.40%	96.03%
3B4giii	Manure management - Turkeys	26.26	2.75	0.000914	0.35%	96.38%
2D3g	Chemical products	38.81	9.88	0.000908	0.35%	96.73%
3B2	Manure management - Sheep	54.41	19.33	0.000857	0.33%	97.06%
1A2gviii	Stationary combustion in manufacturing industries and construction	24.08	3.50	0.000764	0.29%	97.36%
2H2	Food and beverages industry	259.91	156.11	0.000762	0.29%	97.65%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	1.36	11.96	0.000761	0.29%	97.94%
3F	Field burning of agricultural residues	17.25	1.00	0.000662	0.25%	98.20%
3B3	Manure management - Swine	116.25	158.53	0.000656	0.25%	98.45%
2D3c	Asphalt roofing	32.50	9.81	0.000644	0.25%	98.70%

Table 116: NMVOC Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3B4e	Manure management - Horses	42.80	16.25	0.000594	0.23%	98.93%
1A1a	Public electricity and heat production	52.04	81.50	0.000508	0.20%	99.12%
1A3dii	National navigation (shipping)	2.74	9.26	0.000405	0.16%	99.28%
1A3ai(i)	International aviation LTO (civil)	54.79	25.74	0.000385	0.15%	99.43%
2G	Other product use	18.55	6.66	0.000286	0.11%	99.54%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	20.72	26.26	0.000269	0.10%	99.64%
1A5b	Other, Mobile (including military, land based and recreational boats)	0.53	3.11	0.000179	0.07%	99.71%
1A4ci	Agriculture/Forestry/Fishing: Stationary	12.89	16.33	0.000168	0.06%	99.77%
2D3b	Road paving with asphalt	7.50	2.26	0.000149	0.06%	99.83%
3B4f	Manure management - Mules and asses	20.22	9.61	0.000134	0.05%	99.88%
1A3aii(i)	Domestic aviation LTO (civil)	3.19	5.61	0.000078	0.03%	99.91%
2D3a	Domestic solvent use including fungicides	140.32	202.74	0.000075	0.03%	99.94%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.98	4.80	0.000070	0.03%	99.97%
3Da1	Inorganic N-fertilizers (includes also urea application)	49.45	28.71	0.000070	0.03%	99.99%
5D1	Domestic wastewater handling	0.28	0.48	0.000006	0.00%	100.00%

Table 116: NMVOC Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.68	1.05	0.000006	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.12	0.01	0.000005	0.00%	100.00%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.14	0.09	0.000001	0.00%	100.00%
5C2	Open burning of waste	0.58	0.84	0.000000	0.00%	100.00%

Table 117: SOx Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A1a	Public electricity and heat production	21615.28	11357.90	0.072980	40.46%	40.46%
1A3bii	Road transport: Light duty vehicles	1836.65	1.89	0.024524	13.60%	54.06%
1A3biii	Road transport: Heavy duty vehicles and buses	1569.21	2.07	0.020939	11.61%	65.67%
1A4bi	Residential: Stationary	1416.84	150.27	0.014172	7.86%	73.53%
1A3bi	Road transport: Passenger cars	1058.64	7.94	0.013917	7.72%	81.24%
1A2gviii	Stationary combustion in manufacturing industries and construction	1150.00	66.81	0.013262	7.35%	88.60%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	540.00	433.58	0.006603	3.66%	92.26%
1A2gvii	Mobile Combustion in manufacturing industries and construction	247.60	0.04	0.003313	1.84%	94.09%
1A4ci	Agriculture/Forestry/Fishing: Stationary	246.22	31.20	0.002301	1.28%	95.37%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	482.54	693.82	0.002194	1.22%	96.58%
1A3dii	National navigation (shipping)	37.99	126.56	0.002122	1.18%	97.76%
1A5b	Other, Mobile (including military, land based and recreational boats)	10.04	59.07	0.001378	0.76%	98.53%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	123.11	15.60	0.001150	0.64%	99.16%

Table 117: SOx Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	190.00	91.64	0.000380	0.21%	99.37%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	65.00	38.67	0.000363	0.20%	99.58%
1A3biv	Road transport: Mopeds & motorcycles	19.69	0.12	0.000260	0.14%	99.72%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	32.50	20.14	0.000208	0.12%	99.83%
3F	Field burning of agricultural residues	17.25	1.00	0.000199	0.11%	99.95%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	5.50	0.11	0.000070	0.04%	99.98%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	1.92	1.25	0.000014	0.01%	99.99%
1A3ai(i)	International aviation LTO (civil)	32.30	50.77	0.000009	0.00%	100.00%
1A3aia(i)	Domestic aviation LTO (civil)	2.25	3.74	0.000006	0.00%	100.00%
5C2	Open burning of waste	0.05	0.08	0.000000	0.00%	100.00%
2G	Other product use	0.01	0.01	0.000000	0.00%	100.00%

Table 118: NH₃ Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3Da1	Inorganic N-fertilizers (includes also urea application)	1149.39	336.64	0.129912	39.49%	39.49%
3B1a	Manure management - Dairy cattle	643.20	1074.13	0.068082	20.70%	60.19%
3B4gii	Manure management - Broilers	658.44	277.27	0.058103	17.66%	77.85%
1A3bi	Road transport: Passenger cars	59.32	194.64	0.024753	7.53%	85.38%
3F	Field burning of agricultural residues	82.80	4.81	0.013117	3.99%	89.37%
3B1b	Manure management - Non-dairy cattle	296.89	387.28	0.010450	3.18%	92.54%
3B4giii	Manure management - Turkeys	51.02	4.61	0.007762	2.36%	94.90%
3B3	Manure management - Swine	1247.47	1378.77	0.004125	1.25%	96.16%
3B4gi	Manure management - Laying hens	307.63	288.18	0.003515	1.07%	97.23%
3B4e	Manure management - Horses	81.40	57.25	0.002743	0.83%	98.06%
3B4f	Manure management - Mules and asses	99.16	76.72	0.001993	0.61%	98.67%
2G	Other product use	15.90	5.71	0.001593	0.48%	99.15%
3B2	Manure management - Sheep	273.00	245.62	0.001165	0.35%	99.50%
3B4d	Manure management - Goats	196.00	177.27	0.001016	0.31%	99.81%

Table 118: NH₃ Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3bii	Road transport: Light duty vehicles	0.32	2.95	0.000501	0.15%	99.96%
1A3biii	Road transport: Heavy duty vehicles and buses	0.88	1.45	0.000089	0.03%	99.99%
1A2gvii	Mobile Combustion in manufacturing industries and construction	0.10	0.02	0.000014	0.00%	100.00%
1A4bi	Residential: Stationary	6.91	6.02	0.000008	0.00%	100.00%
1A3biv	Road transport: Mopeds & motorcycles	0.31	0.37	0.000004	0.00%	100.00%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.05	0.06	0.000001	0.00%	100.00%

Table 119: PM_{2.5} Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3bii	Road transport: Light duty vehicles	536.52	111.04	0.022755	13.41%	13.41%
2D3b	Road paving with asphalt	197.29	0.11	0.021913	12.92%	26.33%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	145.23	110.46	0.020582	12.13%	38.46%
2G	Other product use	288.98	37.26	0.019754	11.64%	50.11%
1A3bvi	Road transport: Automobile tyre and brake wear	84.43	84.80	0.018563	10.94%	61.05%
1A1a	Public electricity and heat production	727.68	196.41	0.015626	9.21%	70.26%
2A1	Cement production	232.16	55.33	0.007424	4.38%	74.64%
3F	Field burning of agricultural residues	83.40	10.82	0.005680	3.35%	77.98%
1A3bi	Road transport: Passenger cars	129.69	59.61	0.005400	3.18%	81.17%
1A3biii	Road transport: Heavy duty vehicles and buses	199.95	77.94	0.003680	2.17%	83.34%
5A	Biological treatment of waste - Solid waste disposal on land	13.96	13.30	0.002870	1.69%	85.03%
1A3dii	National navigation (shipping)	4.86	16.38	0.002756	1.62%	86.65%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	18.80	13.55	0.002417	1.42%	88.08%
3B3	Manure management - Swine	14.17	11.79	0.002345	1.38%	89.46%

Table 119: PM_{2.5} Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A4ci	Agriculture/Forestry/Fishing: Stationary	18.11	13.06	0.002329	1.37%	90.83%
1A5b	Other, Mobile (including military, land based and recreational boats)	1.21	7.10	0.001693	1.00%	91.83%
1A2gvii	Mobile Combustion in manufacturing industries and construction	27.12	4.43	0.001543	0.91%	92.74%
1A4bi	Residential: Stationary	44.20	69.59	0.001341	0.79%	93.53%
1A2gviii	Stationary combustion in manufacturing industries and construction	19.90	2.80	0.001283	0.76%	94.29%
3B1a	Manure management - Dairy cattle	5.41	5.30	0.001160	0.68%	94.97%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	1.76	6.25	0.001104	0.65%	95.62%
3B4gi	Manure management - Laying hens	12.65	6.99	0.000917	0.54%	96.16%
2A5b	Construction and demolition	14.24	7.15	0.000796	0.47%	96.63%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.68	3.84	0.000765	0.45%	97.08%
1A3ai(i)	International aviation LTO (civil)	4.55	5.36	0.000737	0.43%	97.52%
3B4d	Manure management - Goats	4.48	0.11	0.000463	0.27%	97.79%
3B1b	Manure management - Non-dairy cattle	5.52	2.98	0.000377	0.22%	98.01%
5C2	Open burning of waste	2.36	2.87	0.000352	0.21%	98.22%

Table 119: PM_{2.5} Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
2A5a	Quarrying and mining of minerals other than coal	53.57	16.90	0.000339	0.20%	98.42%
3Da1	Inorganic N-fertilizers (includes also urea application)	3.09	2.00	0.000323	0.19%	98.61%
3B2	Manure management - Sheep	3.17	0.15	0.000303	0.18%	98.79%
2A2	Lime production	4.25	2.33	0.000303	0.18%	98.97%
5C1bv	Cremation	2.90	0.07	0.000301	0.18%	99.14%
1A3biv	Road transport: Mopeds & motorcycles	21.27	6.21	0.000300	0.18%	99.32%
3B4gii	Manure management - Broilers	37.80	11.85	0.000263	0.16%	99.48%
2D3c	Asphalt roofing	11.26	3.02	0.000249	0.15%	99.62%
2A5c	Storage, handling and transport of mineral products	5.84	2.51	0.000184	0.11%	99.73%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	1.13	0.84	0.000155	0.09%	99.82%
5E	Other waste	0.46	0.43	0.000093	0.05%	99.88%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	13.06	21.54	0.000072	0.04%	99.92%
1A3aii(i)	Domestic aviation LTO (civil)	0.41	0.50	0.000062	0.04%	99.96%
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.25	0.16	0.000026	0.02%	99.97%

Table 119: PM_{2.5} Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3B4e	Manure management - Horses	0.70	0.17	0.000020	0.01%	99.98%
3B4f	Manure management - Mules and asses	0.67	0.17	0.000020	0.01%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.07	0.00	0.000006	0.00%	100.00%
3B4giii	Manure management - Turkeys	0.46	0.16	0.000001	0.00%	100.00%

Table 120: PM₁₀ Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
2D3b	Road paving with asphalt	845.55	0.45	0.049656	28.85%	28.85%
1A3bvi	Road transport: Automobile tyre and brake wear	157.78	158.71	0.019664	11.42%	40.27%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	145.23	110.46	0.011840	6.88%	47.15%
1A3bii	Road transport: Light duty vehicles	536.52	111.04	0.011071	6.43%	53.58%
5A	Biological treatment of waste - Solid waste disposal on land	92.64	88.26	0.010837	6.30%	59.88%
2G	Other product use	289.19	37.36	0.010117	5.88%	65.76%
2A5a	Quarrying and mining of minerals other than coal	535.70	122.18	0.008967	5.21%	70.97%
3B3	Manure management - Swine	96.22	63.30	0.006020	3.50%	74.46%
3Da1	Inorganic N-fertilizers (includes also urea application)	80.31	52.08	0.004887	2.84%	77.30%
2A5b	Construction and demolition	142.35	71.55	0.004829	2.81%	80.11%
1A3bi	Road transport: Passenger cars	129.69	59.61	0.003372	1.96%	82.07%
3B4gi	Manure management - Laying hens	65.45	38.85	0.003320	1.93%	83.99%
2A1	Cement production	329.93	88.12	0.003148	1.83%	85.82%
3F	Field burning of agricultural residues	88.03	11.42	0.003071	1.78%	87.61%

Table 120: PM₁₀ Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3biii	Road transport: Heavy duty vehicles and buses	199.95	77.94	0.002621	1.52%	89.13%
3B4giii	Manure management - Turkeys	33.80	1.17	0.001772	1.03%	90.16%
1A1a	Public electricity and heat production	950.13	294.61	0.001526	0.89%	91.05%
1A3dii	National navigation (shipping)	4.86	16.38	0.001515	0.88%	91.93%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	18.80	13.55	0.001396	0.81%	92.74%
1A4ci	Agriculture/Forestry/Fishing: Stationary	18.11	13.06	0.001345	0.78%	93.52%
2A5c	Storage, handling and transport of mineral products	58.44	25.08	0.001190	0.69%	94.21%
1A5b	Other, Mobile (including military, land based and recreational boats)	1.21	7.10	0.000936	0.54%	94.75%
2A2	Lime production	21.23	11.65	0.000901	0.52%	95.28%
1A4bi	Residential: Stationary	45.13	71.31	0.000842	0.49%	95.77%
3B4d	Manure management - Goats	14.93	0.36	0.000812	0.47%	96.24%
2D3c	Asphalt roofing	84.47	22.63	0.000793	0.46%	96.70%
1A2gvii	Mobile Combustion in manufacturing industries and construction	27.12	4.43	0.000778	0.45%	97.15%
1A2gviii	Stationary combustion in manufacturing industries and construction	19.90	2.80	0.000654	0.38%	97.53%

Table 120: PM₁₀ Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3B1a	Manure management - Dairy cattle	14.81	8.14	0.000630	0.37%	97.90%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	1.76	6.35	0.000626	0.36%	98.26%
3B2	Manure management - Sheep	10.56	0.49	0.000530	0.31%	98.57%
3B4gii	Manure management - Broilers	289.80	89.87	0.000464	0.27%	98.84%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.68	3.84	0.000435	0.25%	99.09%
1A3ai(i)	International aviation LTO (civil)	4.55	5.36	0.000422	0.25%	99.34%
3B1b	Manure management - Non-dairy cattle	8.28	4.51	0.000345	0.20%	99.54%
5C2	Open burning of waste	2.54	3.09	0.000218	0.13%	99.66%
5C1bv	Cremation	3.39	0.08	0.000185	0.11%	99.77%
1A3biv	Road transport: Mopeds & motorcycles	21.27	6.21	0.000105	0.06%	99.83%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	1.13	0.84	0.000089	0.05%	99.88%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	13.06	21.61	0.000064	0.04%	99.92%
5E	Other waste	0.46	0.43	0.000053	0.03%	99.95%
1A3aii(i)	Domestic aviation LTO (civil)	0.41	0.50	0.000036	0.02%	99.97%

Table 120: PM₁₀ Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.25	0.16	0.000015	0.01%	99.98%
3B4e	Manure management - Horses	1.10	0.27	0.000015	0.01%	99.99%
3B4f	Manure management - Mules and asses	1.07	0.26	0.000014	0.01%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.07	0.00	0.000003	0.00%	100.00%

Table 121: TSP Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
2D3b	Road paving with asphalt	3664.03	1.96	0.085394	46.73%	46.73%
1A3bvi	Road transport: Automobile tyre and brake wear	207.29	208.26	0.015535	8.50%	55.23%
5A	Biological treatment of waste - Solid waste disposal on land	195.85	186.59	0.013852	7.58%	62.82%
3B3	Manure management - Swine	178.71	141.74	0.009824	5.38%	68.19%
1A1a	Public electricity and heat production	1334.71	392.81	0.007616	4.17%	72.36%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	145.23	110.46	0.007516	4.11%	76.47%
2A5b	Construction and demolition	284.01	142.74	0.007462	4.08%	80.56%
3Da1	Inorganic N-fertilizers (includes also urea application)	80.31	52.08	0.003267	1.79%	82.34%
2G	Other product use	289.23	37.38	0.003065	1.68%	84.02%
1A3biii	Road transport: Heavy duty vehicles and buses	199.95	77.94	0.003027	1.66%	85.68%
1A3bi	Road transport: Passenger cars	129.69	59.61	0.002858	1.56%	87.24%
2A5a	Quarrying and mining of minerals other than coal	1092.83	235.40	0.002280	1.25%	88.49%
2A5c	Storage, handling and transport of mineral products	116.88	50.16	0.002224	1.22%	89.71%
3B4gii	Manure management - Broilers	289.80	89.87	0.002106	1.15%	90.86%

Table 121: TSP Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3B4gi	Manure management - Laying hens	65.45	32.78	0.001709	0.94%	91.79%
2A2	Lime production	54.59	29.95	0.001683	0.92%	92.72%
1A3bii	Road transport: Light duty vehicles	536.52	111.04	0.001567	0.86%	93.57%
2D3c	Asphalt roofing	450.51	120.69	0.001396	0.76%	94.34%
3B1a	Manure management - Dairy cattle	32.45	17.76	0.000996	0.55%	94.88%
3F	Field burning of agricultural residues	89.58	11.62	0.000945	0.52%	95.40%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	18.80	13.55	0.000900	0.49%	95.89%
1A4ci	Agriculture/Forestry/Fishing: Stationary	18.11	13.06	0.000867	0.47%	96.37%
1A4bi	Residential: Stationary	46.99	74.75	0.000801	0.44%	96.80%
3B4d	Manure management - Goats	37.32	0.88	0.000784	0.43%	97.23%
1A3dii	National navigation (shipping)	4.86	16.38	0.000771	0.42%	97.65%
3B4giii	Manure management - Turkeys	33.80	1.17	0.000674	0.37%	98.02%
3B1b	Manure management - Non-dairy cattle	18.10	9.75	0.000540	0.30%	98.32%
3B2	Manure management - Sheep	26.41	1.22	0.000496	0.27%	98.59%

Table 121: TSP Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A5b	Other, Mobile (including military, land based and recreational boats)	1.21	7.10	0.000491	0.27%	98.86%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	1.76	6.58	0.000344	0.19%	99.05%
1A3ai(i)	International aviation LTO (civil)	4.55	5.36	0.000263	0.14%	99.19%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	3.68	3.84	0.000263	0.14%	99.33%
2A1	Cement production	366.59	88.94	0.000220	0.12%	99.46%
1A2gvii	Mobile Combustion in manufacturing industries and construction	27.12	4.43	0.000196	0.11%	99.56%
1A2gviii	Stationary combustion in manufacturing industries and construction	19.90	2.80	0.000189	0.10%	99.67%
5C2	Open burning of waste	2.61	3.17	0.000141	0.08%	99.74%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	13.06	21.78	0.000124	0.07%	99.81%
1A3biv	Road transport: Mopeds & motorcycles	21.27	6.21	0.000117	0.06%	99.87%
5C1bv	Cremation	4.84	0.11	0.000102	0.06%	99.93%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	1.13	0.84	0.000057	0.03%	99.96%
5E	Other waste	0.46	0.43	0.000032	0.02%	99.98%
1A3aii(i)	Domestic aviation LTO (civil)	0.41	0.50	0.000022	0.01%	99.99%

Table 121: TSP Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.25	0.16	0.000010	0.01%	100.00%
3B4e	Manure management - Horses	2.40	0.59	0.000002	0.00%	100.00%
3B4f	Manure management - Mules and asses	2.28	0.56	0.000002	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.07	0.00	0.000001	0.00%	100.00%

Table 122: BC Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3bii	Road transport: Light duty vehicles	326.59	74.17	0.069846	40.72%	40.72%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	81.33	61.85	0.043144	25.15%	65.87%
1A3bi	Road transport: Passenger cars	77.39	38.49	0.012627	7.36%	73.23%
1A3biii	Road transport: Heavy duty vehicles and buses	105.10	47.53	0.010538	6.14%	79.37%
1A1a	Public electricity and heat production	40.75	11.00	0.006281	3.66%	83.03%
2D3b	Road paving with asphalt	11.25	0.01	0.005960	3.47%	86.51%
1A2gvii	Mobile Combustion in manufacturing industries and construction	16.54	2.70	0.005009	2.92%	89.43%
1A4ci	Agriculture/Forestry/Fishing: Stationary	10.14	7.31	0.004823	2.81%	92.24%
1A2gviii	Stationary combustion in manufacturing industries and construction	11.14	1.57	0.003728	2.17%	94.41%
3F	Field burning of agricultural residues	7.72	1.00	0.002701	1.57%	95.99%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	2.06	2.15	0.001665	0.97%	96.96%
2A1	Cement production	6.96	1.66	0.001380	0.80%	97.76%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	7.32	11.11	0.001029	0.60%	98.36%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.98	2.20	0.000843	0.49%	98.85%

Table 122: BC Trend Assessment

NFR Code	NFR Category	2000 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
5C2	Open burning of waste	0.99	1.20	0.000557	0.32%	99.18%
1A3biv	Road transport: Mopeds & motorcycles	3.99	1.13	0.000540	0.31%	99.49%
2G	Other product use	1.30	0.17	0.000456	0.27%	99.76%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.63	0.47	0.000323	0.19%	99.95%
1A4bi	Residential: Stationary	4.27	6.87	0.000068	0.04%	99.99%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.04	0.00	0.000016	0.01%	100.00%
2A2	Lime production	0.02	0.01	0.000005	0.00%	100.00%
2D3c	Asphalt roofing	0.00	0.00	0.000000	0.00%	100.00%

Table 123: CO Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3bi	Road transport: Passenger cars	26701.02	6450.05	0.050761	38.39%	38.39%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	1892.99	2420.68	0.017307	13.09%	51.48%
1A3bii	Road transport: Light duty vehicles	5753.96	1142.95	0.016626	12.57%	64.05%
3F	Field burning of agricultural residues	2301.15	133.61	0.014097	10.66%	74.71%
1A3biii	Road transport: Heavy duty vehicles and buses	1015.29	755.76	0.009824	7.43%	82.14%
1A4bi	Residential: Stationary	563.76	522.25	0.007817	5.91%	88.06%
1A3ai(i)	International aviation LTO (civil)	486.60	392.82	0.005413	4.09%	92.15%
1A3biv	Road transport: Mopeds & motorcycles	3750.52	1383.90	0.003873	2.93%	95.08%
1A1a	Public electricity and heat production	341.65	427.38	0.003343	2.53%	97.61%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	67.33	85.32	0.000634	0.48%	98.09%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	29.84	73.70	0.000545	0.41%	98.50%
1A2gvii	Mobile Combustion in manufacturing industries and construction	132.74	22.77	0.000466	0.35%	98.85%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	3.59	24.21	0.000419	0.32%	99.17%
1A4ci	Agriculture/Forestry/Fishing: Stationary	34.02	43.10	0.000320	0.24%	99.41%

Table 123: CO Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2gviii	Stationary combustion in manufacturing industries and construction	63.56	9.23	0.000262	0.20%	99.61%
2G	Other product use	211.16	75.85	0.000171	0.13%	99.74%
5C2	Open burning of waste	26.43	38.19	0.000141	0.11%	99.84%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	10.50	12.66	0.000114	0.09%	99.93%
1A3a(ii)(i)	Domestic aviation LTO (civil)	33.83	60.42	0.000086	0.06%	99.99%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	1.80	2.78	0.000005	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.30	0.01	0.000002	0.00%	100.00%
2D3c	Asphalt roofing	2.38	0.72	0.000001	0.00%	100.00%

Table 124: Pb Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A3bi	Road transport: Passenger cars	29.4999	14.4087	0.067284	67.61%	67.61%
1A3biv	Road transport: Mopeds & motorcycles	1.3128	0.1954	0.013371	13.44%	81.04%
1A3biii	Road transport: Heavy duty vehicles and buses	4.0969	5.3472	0.010336	10.39%	91.43%
1A3bii	Road transport: Light duty vehicles	7.6603	4.7662	0.006376	6.41%	97.84%
1A3bvi	Road transport: Automobile tyre and brake wear	0.1244	0.2192	0.001007	1.01%	98.85%
1A1a	Public electricity and heat production	0.1032	0.0926	0.000748	0.75%	99.60%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.1224	0.1608	0.000285	0.29%	99.89%
3F	Field burning of agricultural residues	0.0038	0.0002	0.000047	0.05%	99.93%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0000	0.0009	0.000021	0.02%	99.95%
1A4bi	Residential: Stationary	0.0027	0.0024	0.000018	0.02%	99.97%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0000	0.0007	0.000016	0.02%	99.99%
2G	Other product use	0.0034	0.0016	0.000010	0.01%	100.00%
1A2gviii	Stationary combustion in manufacturing industries and construction	0.0001	0.0000	0.000001	0.00%	100.00%
5C2	Open burning of waste	0.0002	0.0003	0.000000	0.00%	100.00%

Table 124: Pb Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0000	0.0001	0.000000	0.00%	100.00%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0000	0.0000	0.000000	0.00%	100.00%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0000	0.0000	0.000000	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.0000	0.000000	0.00%	100.00%

Table 125: Cd Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3F	Field burning of agricultural residues	0.0304	0.0018	0.205534	56.03%	56.03%
1A1a	Public electricity and heat production	0.0272	0.0244	0.094469	25.75%	81.79%
1A3bi	Road transport: Passenger cars	0.0018	0.0041	0.020451	5.58%	87.36%
2G	Other product use	0.0054	0.0019	0.016613	4.53%	91.89%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0100	0.0131	0.008980	2.45%	94.34%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0000	0.0004	0.005265	1.44%	95.78%
1A4bi	Residential: Stationary	0.0013	0.0011	0.004067	1.11%	96.88%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0000	0.0003	0.003871	1.06%	97.94%
1A3bii	Road transport: Light duty vehicles	0.0009	0.0008	0.003199	0.87%	98.81%
1A3bvi	Road transport: Automobile tyre and brake wear	0.0006	0.0010	0.002661	0.73%	99.54%
1A2gvii	Mobile Combustion in manufacturing industries and construction	0.0001	0.0000	0.000667	0.18%	99.72%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0007	0.0009	0.000621	0.17%	99.89%
1A3biv	Road transport: Mopeds & motorcycles	0.0001	0.0001	0.000245	0.07%	99.96%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.0001	0.0001	0.000090	0.02%	99.98%

Table 125: Cd Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
5C2	Open burning of waste	0.0000	0.0001	0.000033	0.01%	99.99%
1A2gviii	Stationary combustion in manufacturing industries and construction	0.0000	0.0000	0.000033	0.01%	100.00%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0000	0.0000	0.000005	0.00%	100.00%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0000	0.0000	0.000002	0.00%	100.00%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0000	0.0000	0.000000	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.0000	0.000000	0.00%	100.00%

Table 126: Hg Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0613	0.0804	0.173157	77.37%	77.37%
3F	Field burning of agricultural residues	0.0048	0.0003	0.046268	20.67%	98.04%
1A1a	Public electricity and heat production	0.0077	0.0071	0.002168	0.97%	99.01%
1A2gviii	Stationary combustion in manufacturing industries and construction	0.0001	0.0000	0.000999	0.45%	99.45%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0001	0.0001	0.000703	0.31%	99.77%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0000	0.0000	0.000229	0.10%	99.87%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0001	0.0001	0.000144	0.06%	99.94%
1A4bi	Residential: Stationary	0.0004	0.0004	0.000086	0.04%	99.97%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0000	0.0000	0.000032	0.01%	99.99%
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0000	0.0000	0.000018	0.01%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.0000	0.000005	0.00%	100.00%
1A3bvi	Road transport: Automobile tyre and brake wear	0.0000	0.0000	0.000003	0.00%	100.00%
2G	Other product use	0.0000	0.0000	0.000001	0.00%	100.00%

Table 127: PCDD/F Trend Assessment

NFR Code	NFR Category	1990 Emissions (in g I-TEQ)	2015 Emissions (in g I-TEQ)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A4bi	Residential: Stationary	0.0965	0.0873	0.032881	32.87%	32.87%
1A3bi	Road transport: Passenger cars	0.0921	0.1122	0.025987	25.98%	58.84%
1A3bii	Road transport: Light duty vehicles	0.0658	0.0595	0.022410	22.40%	81.24%
1A1a	Public electricity and heat production	0.0566	0.0873	0.007188	7.19%	88.43%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0186	0.0267	0.003270	3.27%	91.70%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0061	0.0072	0.001832	1.83%	93.53%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0001	0.0034	0.001573	1.57%	95.10%
3F	Field burning of agricultural residues	0.0216	0.0013	0.001370	1.37%	96.47%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0006	0.0037	0.001219	1.22%	97.69%
1A3biv	Road transport: Mopeds & motorcycles	0.0034	0.0032	0.001202	1.20%	98.89%
5C2	Open burning of waste	0.0047	0.0068	0.000823	0.82%	99.71%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0007	0.0009	0.000187	0.19%	99.90%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0002	0.0003	0.000064	0.06%	99.96%
1A2gviii	Stationary combustion in manufacturing industries and construction	0.0013	0.0002	0.000030	0.03%	99.99%

Table 127: PCDD/F Trend Assessment

NFR Code	NFR Category	1990 Emissions (in g I-TEQ)	2015 Emissions (in g I-TEQ)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0000	0.0001	0.000005	0.00%	100.00%
5E	Other waste	0.0000	0.0000	0.000003	0.00%	100.00%
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.0000	0.000000	0.00%	100.00%
2G	Other product use	0.0000	0.0000	0.000000	0.00%	100.00%

Table 128: PAHs Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
3F	Field burning of agricultural residues	13.6413	0.7920	0.028784	77.29%	77.29%
1A1a	Public electricity and heat production	0.2038	0.3235	0.004745	12.74%	90.03%
1A4bi	Residential: Stationary	0.0351	0.0308	0.001985	5.33%	95.36%
1A3bii	Road transport: Light duty vehicles	0.0072	0.0074	0.000464	1.25%	96.61%
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0145	0.0073	0.000429	1.15%	97.76%
5C2	Open burning of waste	0.0060	0.0086	0.000200	0.54%	98.30%
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0032	0.0039	0.000162	0.43%	98.73%
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.0091	0.0191	0.000122	0.33%	99.06%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0041	0.0062	0.000113	0.30%	99.36%
1A2gviii	Stationary combustion in manufacturing industries and construction	0.0194	0.0028	0.000080	0.21%	99.58%
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0011	0.0028	0.000049	0.13%	99.71%
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.0008	0.0011	0.000038	0.10%	99.81%
2G	Other product use	0.0009	0.0003	0.000018	0.05%	99.86%
1A3biv	Road transport: Mopeds & motorcycles	0.0003	0.0003	0.000016	0.04%	99.91%

Table 128: PAHs Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Mg)	2015 Emissions (in Mg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0005	0.0008	0.000014	0.04%	99.94%
1A2gvii	Mobile Combustion in manufacturing industries and construction	0.0017	0.0003	0.000010	0.03%	99.97%
1A3bi	Road transport: Passenger cars	0.0074	0.0143	0.000010	0.03%	100.00%
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0000	0.0000	0.000000	0.00%	100.00%

Table 129: HCB Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Kg)	2015 Emissions (in Kg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0057	0.0075	0.059925	87.84%	87.84%
1A4bi	Residential: Stationary	0.0005	0.0004	0.007003	10.27%	98.10%
1A3bii	Road transport: Light duty vehicles	0.0000	0.0000	0.000731	1.07%	99.18%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0000	0.0000	0.000333	0.49%	99.66%
1A3bi	Road transport: Passenger cars	0.0001	0.0001	0.000177	0.26%	99.92%
1A3biv	Road transport: Mopeds & motorcycles	0.0000	0.0000	0.000052	0.08%	100.00%

Table 130: PCBs Trend Assessment

NFR Code	NFR Category	1990 Emissions (in Kg)	2015 Emissions (in Kg)	Trend Assessment	Contribution to Trend (%)	Cumulative Total
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0257	0.0338	0.165852	93.45%	93.45%
1A4bi	Residential: Stationary	0.0059	0.0052	0.010921	6.15%	99.60%
1A3bi	Road transport: Passenger cars	0.0000	0.0000	0.000539	0.30%	99.91%
1A3bii	Road transport: Light duty vehicles	0.0000	0.0000	0.000082	0.05%	99.95%
1A3biv	Road transport: Mopeds & motorcycles	0.0000	0.0000	0.000045	0.03%	99.98%
1A3biii	Road transport: Heavy duty vehicles and buses	0.0000	0.0000	0.000041	0.02%	100.00%

15. Annex 4: Uncertainty Analysis per Pollutant

Uncertainty Analysis per Pollutant for 2015

Table 131: NOx emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015	Uncertainty introduced into the trend in total national emissions
		Gg	Gg	%	%	%	%	%
1A1a	NOx	3.213	4.845	0	10	10.00	3.17	1.12
1A2a	NOx	0.002	0.000	2	40	40.05	0.00	0.01
1A2b	NOx	0.082	0.098	2	40	40.05	0.26	0.06
1A2c	NOx	0.028	0.044	2	40	40.05	0.12	0.04
1A2d	NOx	0.014	0.022	2	40	40.05	0.06	0.02
1A2e	NOx	0.232	0.468	2	40	40.05	1.23	0.62
1A2f	NOx	1.621	2.138	2	0	2.00	0.28	0.37
1A2gvii	NOx	0.406	0.070	2	40	40.05	0.18	0.77
1A2gviii	NOx	0.494	0.072	2	40	40.05	0.19	0.97
1A3ai(i)	NOx	0.376	0.667	1	200	200.00	8.73	3.85
1A3aii(i)	NOx	0.014	0.026	1	200	200.00	0.34	0.16
1A3bi	NOx	2.879	1.358	1	30	30.02	2.67	2.52
1A3bii	NOx	2.232	1.271	1	30	30.02	2.50	1.55
1A3biii	NOx	3.030	3.017	1	30	30.02	5.93	0.39
1A3biv	NOx	0.029	0.040	1	30	30.02	0.08	0.02
1A3dii	NOx	0.037	0.129	1	200	200.00	1.68	1.15
1A4bi	NOx	0.159	0.166	1	200	200.00	2.18	0.20
1A4ci	NOx	0.264	0.335	1	100	100.00	2.19	0.53
1A4cii	NOx	0.216	0.273	1	100	100.00	1.79	0.43
1A4ciii	NOx	0.002	0.001	1	100	100.00	0.01	0.00
1A5b	NOx	0.008	0.048	1	100	100.00	0.31	0.25
2G	NOx	0.007	0.002	100	20	101.98	0.02	0.02
3B1a	NOx	0.005	0.003	2	150	150.01	0.03	0.02
3B1b	NOx	0.005	0.001	2	150	150.01	0.01	0.03
3B2	NOx	0.001	0.001	2	150	150.01	0.01	0.01
3B3	NOx	0.000	0.007	2	150	150.01	0.07	0.06
3B4d	NOx	0.001	0.000	2	150	150.01	0.00	0.01
3B4e	NOx	0.001	0.000	2	150	150.01	0.00	0.01
3B4f	NOx	0.001	0.000	2	150	150.01	0.00	0.01
3B4gi	NOx	0.003	0.001	2	150	150.01	0.01	0.02
3B4gii	NOx	0.005	0.003	2	150	150.01	0.03	0.01
3B4giii	NOx	0.000	0.000	2	150	150.01	0.00	0.00
3Da1	NOx	0.566	0.166	10	150	150.33	1.63	3.42
3F	NOx	0.079	0.005	100	200	223.61	0.07	0.87
5C2	NOx	0.002	0.002	100	50	111.80	0.02	0.02
Total		16.187	15.280				35.783	19.539

Table 132: NMVOC emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	NMVOC	0.052	0.081	0	10	0.11	0.04
1A2a	NMVOC	0.000	0.000	2	40	0.00	0.00
1A2b	NMVOC	0.004	0.005	2	40	0.03	0.01
1A2c	NMVOC	0.001	0.012	2	40	0.06	0.03
1A2d	NMVOC	0.001	0.001	2	40	0.01	0.00
1A2e	NMVOC	0.011	0.030	2	40	0.16	0.07
1A2f	NMVOC	0.040	0.038	2	0	0.01	0.01
1A2gvii	NMVOC	0.042	0.007	2	40	0.04	0.05
1A2gviii	NMVOC	0.024	0.003	2	40	0.02	0.03
1A3ai(i)	NMVOC	0.055	0.026	1	200	0.70	0.08
1A3aii(i)	NMVOC	0.003	0.006	1	200	0.15	0.06
1A3bi	NMVOC	2.905	0.654	1	30	2.66	2.23
1A3bii	NMVOC	0.529	0.120	1	30	0.49	0.40
1A3biii	NMVOC	0.443	0.164	1	30	0.66	0.20
1A3biv	NMVOC	1.420	0.388	1	30	1.58	0.94
1A3bv	NMVOC	1.555	1.182	1	0	0.16	0.13
1A3dii	NMVOC	0.003	0.009	1	200	0.25	0.12
1A4bi	NMVOC	0.061	0.054	1	200	1.46	0.29
1A4ci	NMVOC	0.013	0.016	1	100	0.22	0.07
1A4cii	NMVOC	0.021	0.026	1	100	0.36	0.11
1A4ciii	NMVOC	0.000	0.000	1	100	0.00	0.00
1A5b	NMVOC	0.001	0.003	1	100	0.04	0.02
1B2av	NMVOC	0.716	0.782	1	0	0.11	0.08
2D3a	NMVOC	0.140	0.203	20	20	0.78	0.48
2D3b	NMVOC	0.008	0.002	50	20	0.02	0.01
2D3c	NMVOC	0.033	0.010	50	20	0.07	0.05
2D3d	NMVOC	1.739	1.617	20	20	6.19	3.62
2D3f	NMVOC	0.200	0.053	100	20	0.73	0.57
2D3g	NMVOC	0.039	0.010	20	20	0.04	0.03
2D3h	NMVOC	0.200	0.247	20	20	0.95	0.57
2G	NMVOC	0.019	0.007	100	20	0.09	0.07
2H2	NMVOC	0.260	0.156	2	200	4.23	0.16
3B1a	NMVOC	0.402	0.208	2	150	4.22	0.21
3B1b	NMVOC	0.287	0.128	2	150	2.61	0.38

Table 132: NMVOC emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
3B2	NMVOC	0.054	0.019	2	150	0.39	0.13
3B3	NMVOC	0.116	0.159	2	150	3.22	1.06
3B4d	NMVOC	0.087	0.010	2	150	0.21	0.44
3B4e	NMVOC	0.043	0.016	2	150	0.33	0.09
3B4f	NMVOC	0.020	0.010	2	150	0.20	0.02
3B4gi	NMVOC	0.106	0.045	2	150	0.91	0.17
3B4gii	NMVOC	0.323	0.216	2	150	4.39	0.40
3B4giii	NMVOC	0.026	0.003	2	150	0.06	0.14
3Da1	NMVOC	0.049	0.029	10	150	0.58	0.03
3F	NMVOC	0.017	0.001	100	200	0.03	0.13
5A	NMVOC	0.527	0.629	10	50	4.34	1.43
5C2	NMVOC	0.001	0.001	100	50	0.01	0.01
5D1	NMVOC	0.000	0.000	10	50	0.00	0.00
Total		13.139	7.386			43.853	15.180

Table 133: SOx emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
1A1a	SOx	21,615	11,358	0	10	8,63	0,72
1A2a	SOx	0,006	0,000	2	40	0,00	0,00
1A2b	SOx	0,190	0,092	2	40	0,28	0,02
1A2c	SOx	0,065	0,039	2	40	0,12	0,01
1A2d	SOx	0,033	0,020	2	40	0,06	0,01
1A2e	SOx	0,540	0,434	2	40	1,32	0,27
1A2f	SOx	0,483	0,694	2	0	0,11	0,06
1A2gvii	SOx	0,248	0,000	2	40	0,00	0,13
1A2gviii	SOx	1,150	0,067	2	40	0,20	0,53
1A3ai(i)	SOx	0,032	0,051	1	200	0,77	0,24
1A3aii(i)	SOx	0,002	0,004	1	200	0,06	0,02
1A3bi	SOx	1,059	0,008	1	30	0,02	0,42
1A3bii	SOx	1,837	0,002	1	30	0,00	0,74
1A3biii	SOx	1,569	0,002	1	30	0,00	0,63
1A3biv	SOx	0,020	0,000	1	30	0,00	0,01
1A3dii	SOx	0,038	0,127	1	200	1,92	0,71
1A4bi	SOx	1,417	0,150	1	200	2,28	2,83
1A4ci	SOx	0,246	0,031	1	100	0,24	0,23
1A4cii	SOx	0,123	0,016	1	100	0,12	0,12
1A4ciii	SOx	0,002	0,001	1	100	0,01	0,00
1A5b	SOx	0,010	0,059	1	100	0,45	0,18
2G	SOx	0,000	0,000	100	20	0,00	0,00
3F	SOx	0,017	0,001	100	200	0,02	0,04
5C2	SOx	0,000	0,000	100	50	0,00	0,00
Total		31,348	13,154			16,619	7,905

Table 134: NH₃ emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
1A2gvii	NH ₃	0,000	0,000	2	40	0,00	0,00
1A3bi	NH ₃	0,059	0,195	1	30	1,29	0,83
1A3bii	NH ₃	0,000	0,003	1	30	0,02	0,02
1A3biii	NH ₃	0,001	0,001	1	30	0,01	0,00
1A3biv	NH ₃	0,000	0,000	1	30	0,00	0,00
1A4bi	NH ₃	0,007	0,006	1	200	0,27	0,00
1A4cii	NH ₃	0,000	0,000	1	100	0,00	0,00
2G	NH ₃	0,016	0,006	100	20	0,13	0,16
3B1a	NH ₃	0,643	1,074	2	150	35,49	14,77
3B1b	NH ₃	0,297	0,387	2	150	12,80	3,68
3B2	NH ₃	0,273	0,246	2	150	8,12	0,22
3B3	NH ₃	1,247	1,379	2	150	45,55	8,25
3B4d	NH ₃	0,196	0,177	2	150	5,86	0,18
3B4e	NH ₃	0,081	0,057	2	150	1,89	0,41
3B4f	NH ₃	0,099	0,077	2	150	2,53	0,30
3B4gi	NH ₃	0,308	0,288	2	150	9,52	0,55
3B4gii	NH ₃	0,658	0,277	2	150	9,16	8,71
3B4giii	NH ₃	0,051	0,005	2	150	0,15	1,16
3B4giv	NH ₃	0,003		2	150		
3Da1	NH ₃	1,149	0,337	10	150	11,15	19,47
3F	NH ₃	0,083	0,005	100	200	0,24	2,63
Total		5,174	4,541			144,390	61,332

Table 135: PM_{2.5} emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	PM _{2.5}	0,728	0,196	0	10	1,95	0,16
1A2a	PM _{2.5}	0,000	0,000	2	40	0,00	0,00
1A2b	PM _{2.5}	0,004	0,004	2	40	0,15	0,03
1A2c	PM _{2.5}	0,002	0,006	2	40	0,25	0,08
1A2d	PM _{2.5}	0,001	0,001	2	40	0,03	0,01
1A2e	PM _{2.5}	0,013	0,022	2	40	0,86	0,23
1A2f	PM _{2.5}	0,145	0,110	2	0	0,22	0,10
1A2gvii	PM _{2.5}	0,027	0,004	2	40	0,18	0,06
1A2gviii	PM _{2.5}	0,020	0,003	2	40	0,11	0,05
1A3ai(i)	PM _{2.5}	0,005	0,005	1	200	1,07	0,26
1A3aii(i)	PM _{2.5}	0,000	0,000	1	200	0,10	0,02
1A3bi	PM _{2.5}	0,130	0,060	1	30	1,78	0,16
1A3bii	PM _{2.5}	0,537	0,111	1	30	3,31	0,68
1A3biii	PM _{2.5}	0,200	0,078	1	30	2,33	0,12
1A3biv	PM _{2.5}	0,021	0,006	1	30	0,19	0,01
1A3bvi	PM _{2.5}	0,084	0,085	1	0	0,08	0,04
1A3dii	PM _{2.5}	0,005	0,016	1	200	3,26	0,98
1A4bi	PM _{2.5}	0,044	0,070	1	200	13,84	3,65
1A4ci	PM _{2.5}	0,018	0,013	1	100	1,30	0,23
1A4cii	PM _{2.5}	0,019	0,014	1	100	1,35	0,24
1A4ciii	PM _{2.5}	0,000	0,000	1	100	0,02	0,00
1A5b	PM _{2.5}	0,001	0,007	1	100	0,71	0,22
2A1	PM _{2.5}	0,232	0,055	1	200	11,00	1,48
2A2	PM _{2.5}	0,004	0,002	1	200	0,46	0,06
2A5a	PM _{2.5}	0,054	0,017	10	200	3,37	0,10
2A5b	PM _{2.5}	0,014	0,007	100	200	1,59	0,37
2A5c	PM _{2.5}	0,006	0,003	50	200	0,51	0,07
2D3b	PM _{2.5}	0,197	0,000	50	20	0,01	0,44
2D3c	PM _{2.5}	0,011	0,003	50	20	0,16	0,07
2G	PM _{2.5}	0,289	0,037	100	20	3,78	1,80
3B1a	PM _{2.5}	0,005	0,005	2	150	0,79	0,17
3B1b	PM _{2.5}	0,006	0,003	2	150	0,44	0,06
3B2	PM _{2.5}	0,003	0,000	2	150	0,02	0,05

Table 135: PM_{2.5} emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
3B3	PM _{2.5}	0,014	0,012	2	150	1,76	0,35
3B4d	PM _{2.5}	0,004	0,000	2	150	0,02	0,07
3B4e	PM _{2.5}	0,001	0,000	2	150	0,03	0,00
3B4f	PM _{2.5}	0,001	0,000	2	150	0,02	0,00
3B4gi	PM _{2.5}	0,013	0,007	2	150	1,04	0,14
3B4gii	PM _{2.5}	0,038	0,012	2	150	1,77	0,04
3B4giii	PM _{2.5}	0,000	0,000	2	150	0,02	0,00
3Da1	PM _{2.5}	0,003	0,002	10	150	0,30	0,05
3F	PM _{2.5}	0,083	0,011	100	200	2,41	1,24
5A	PM _{2.5}	0,014	0,013	10	50	0,67	0,16
5C1bv	PM _{2.5}	0,003	0,000	2	50	0,00	0,02
5C2	PM _{2.5}	0,002	0,003	100	50	0,32	0,14
5E	PM _{2.5}	0,000	0,000	100	50	0,05	0,02
Total		3,007	1,006			63,624	14,243

Table 136: PM₁₀ emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	PM ₁₀	0,950	0,295	0	10	1,71	0,02
1A2a	PM ₁₀	0,000	0,000	2	40	0,00	0,00
1A2b	PM ₁₀	0,004	0,004	2	40	0,09	0,02
1A2c	PM ₁₀	0,002	0,006	2	40	0,15	0,04
1A2d	PM ₁₀	0,001	0,001	2	40	0,02	0,00
1A2e	PM ₁₀	0,013	0,022	2	40	0,50	0,13
1A2f	PM ₁₀	0,145	0,110	2	0	0,13	0,06
1A2gvii	PM ₁₀	0,027	0,004	2	40	0,10	0,03
1A2gviii	PM ₁₀	0,020	0,003	2	40	0,06	0,03
1A3ai(i)	PM ₁₀	0,005	0,005	1	200	0,62	0,14
1A3aii(i)	PM ₁₀	0,000	0,000	1	200	0,06	0,01
1A3bi	PM ₁₀	0,130	0,060	1	30	1,04	0,10
1A3bii	PM ₁₀	0,537	0,111	1	30	1,93	0,33
1A3biii	PM ₁₀	0,200	0,078	1	30	1,35	0,08
1A3biv	PM ₁₀	0,021	0,006	1	30	0,11	0,00
1A3bvi	PM ₁₀	0,158	0,159	1	0	0,09	0,04
1A3dii	PM ₁₀	0,005	0,016	1	200	1,90	0,55
1A4bi	PM ₁₀	0,045	0,071	1	200	8,26	2,10
1A4ci	PM ₁₀	0,018	0,013	1	100	0,76	0,13
1A4cii	PM ₁₀	0,019	0,014	1	100	0,78	0,14
1A4ciii	PM ₁₀	0,000	0,000	1	100	0,01	0,00
1A5b	PM ₁₀	0,001	0,007	1	100	0,41	0,12
2A1	PM ₁₀	0,330	0,088	1	200	10,20	0,63
2A2	PM ₁₀	0,021	0,012	1	200	1,35	0,18
2A5a	PM ₁₀	0,536	0,122	10	200	14,16	1,82
2A5b	PM ₁₀	0,142	0,072	100	200	9,26	2,10
2A5c	PM ₁₀	0,058	0,025	50	200	2,99	0,40
2D3b	PM ₁₀	0,846	0,000	50	20	0,01	0,99
2D3c	PM ₁₀	0,084	0,023	50	20	0,71	0,30
2G	PM ₁₀	0,289	0,037	100	20	2,21	1,00
3B1a	PM ₁₀	0,015	0,008	2	150	0,71	0,09
3B1b	PM ₁₀	0,008	0,005	2	150	0,39	0,05
3B2	PM ₁₀	0,011	0,000	2	150	0,04	0,08

Table 136: PM₁₀ emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
3B3	PM ₁₀	0,096	0,063	2	150	5,50	0,90
3B4d	PM ₁₀	0,015	0,000	2	150	0,03	0,12
3B4e	PM ₁₀	0,001	0,000	2	150	0,02	0,00
3B4f	PM ₁₀	0,001	0,000	2	150	0,02	0,00
3B4gi	PM ₁₀	0,065	0,039	2	150	3,37	0,50
3B4gii	PM ₁₀	0,290	0,090	2	150	7,80	0,08
3B4giii	PM ₁₀	0,034	0,001	2	150	0,10	0,27
3Da1	PM ₁₀	0,080	0,052	10	150	4,53	0,75
3F	PM ₁₀	0,088	0,011	100	200	1,48	0,68
5A	PM ₁₀	0,093	0,088	10	50	2,61	0,59
5C1bv	PM ₁₀	0,003	0,000	2	50	0,00	0,01
5C2	PM ₁₀	0,003	0,003	100	50	0,20	0,08
5E	PM ₁₀	0,000	0,000	100	50	0,03	0,01
Total		5,419	1,727			87,803	15,736

Table 137: TSP emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	TSP	1,335	0,393	0	10	1,64	0,08
2A5a	TSP	1,093	0,235	10	200	19,68	0,57
1A3bvi	TSP	0,207	0,208	1	0	0,09	0,03
5A	TSP	0,196	0,187	10	50	3,97	0,74
2A5b	TSP	0,284	0,143	100	200	13,33	2,49
3B3	TSP	0,179	0,142	2	150	8,88	1,47
2D3c	TSP	0,451	0,121	50	20	2,71	0,84
1A3bii	TSP	0,537	0,111	1	30	1,39	0,05
1A2f	TSP	0,145	0,110	2	0	0,09	0,03
3B4gii	TSP	0,290	0,090	2	150	5,63	0,32
2A1	TSP	0,367	0,089	1	200	7,43	0,04
1A3biii	TSP	0,200	0,078	1	30	0,98	0,09
1A4bi	TSP	0,047	0,075	1	200	6,24	1,26
1A3bi	TSP	0,130	0,060	1	30	0,75	0,09
3Da1	TSP	0,080	0,052	10	150	3,27	0,50
2A5c	TSP	0,117	0,050	50	200	4,32	0,57
2G	TSP	0,289	0,037	100	20	1,59	0,53
3B4gi	TSP	0,065	0,033	2	150	2,05	0,26
2A2	TSP	0,055	0,030	1	200	2,50	0,34
1A2e	TSP	0,013	0,022	2	40	0,36	0,07
3B1a	TSP	0,032	0,018	2	150	1,11	0,15
1A3dii	TSP	0,005	0,016	1	200	1,37	0,30
1A4cii	TSP	0,019	0,014	1	100	0,57	0,09
1A4ci	TSP	0,018	0,013	1	100	0,55	0,09
3F	TSP	0,090	0,012	100	200	1,08	0,25
3B1b	TSP	0,018	0,010	2	150	0,61	0,08
1A5b	TSP	0,001	0,007	1	100	0,30	0,07
1A2c	TSP	0,002	0,007	2	40	0,11	0,02
1A3biv	TSP	0,021	0,006	1	30	0,08	0,00
1A3ai(i)	TSP	0,005	0,005	1	200	0,45	0,08
1A2gvii	TSP	0,027	0,004	2	40	0,07	0,01
1A2b	TSP	0,004	0,004	2	40	0,06	0,01
5C2	TSP	0,003	0,003	100	50	0,15	0,05
1A2gviii	TSP	0,020	0,003	2	40	0,05	0,01

Table 137: TSP emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
2D3b	TSP	3,664	0,002	50	20	0,04	1,70
3B2	TSP	0,026	0,001	2	150	0,08	0,07
3B4giii	TSP	0,034	0,001	2	150	0,07	0,10
3B4d	TSP	0,037	0,001	2	150	0,06	0,12
1A2d	TSP	0,001	0,001	2	40	0,01	0,00
3B4e	TSP	0,002	0,001	2	150	0,04	0,00
3B4f	TSP	0,002	0,001	2	150	0,04	0,00
1A3aii(i)	TSP	0,000	0,000	1	200	0,04	0,01
5E	TSP	0,000	0,000	100	50	0,02	0,01
1A4ciii	TSP	0,000	0,000	1	100	0,01	0,00
5C1bv	TSP	0,005	0,000	2	50	0,00	0,01
1A2a	TSP	0,000	0,000	2	40	0,00	0,00
Total		10,119	2,395			93,861	13,584

Table 138: BC emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	BC	0,041	0,011	0	10	0,40	0,06
1A2a	BC	0,000	0,000	2	40	0,00	0,00
1A2b	BC	0,002	0,002	2	40	0,32	0,08
1A2c	BC	0,001	0,002	2	40	0,32	0,10
1A2d	BC	0,001	0,000	2	40	0,07	0,01
1A2e	BC	0,007	0,011	2	40	1,63	0,47
1A2f	BC	0,081	0,062	2	0	0,45	0,24
1A2gvii	BC	0,017	0,003	2	40	0,40	0,20
1A2gviii	BC	0,011	0,002	2	40	0,23	0,15
1A3bi	BC	0,077	0,038	1	30	4,24	0,39
1A3bii	BC	0,327	0,074	1	30	8,17	2,09
1A3biii	BC	0,105	0,048	1	30	5,23	0,33
1A3biv	BC	0,004	0,001	1	30	0,12	0,02
1A4bi	BC	0,004	0,007	1	200	5,04	1,46
1A4ci	BC	0,010	0,007	1	100	2,68	0,48
2A1	BC	0,007	0,002	1	200	1,22	0,28
2A2	BC	0,000	0,000	1	200	0,01	0,00
2D3b	BC	0,011	0,000	50	20	0,00	0,12
2D3c	BC	0,000	0,000	50	20	0,00	0,00
2G	BC	0,001	0,000	100	20	0,06	0,03
3F	BC	0,008	0,001	100	200	0,82	0,58
5C2	BC	0,001	0,001	100	50	0,49	0,24
Total		0,717	0,273			31,916	7,335

Table 139: CO emission Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	CO	0,342	0,427	0	10	0,30	0,07
1A2a	CO	0,000	0,000	2	40	0,00	0,00
1A2b	CO	0,011	0,013	2	40	0,04	0,01
1A2c	CO	0,004	0,024	2	40	0,07	0,02
1A2d	CO	0,002	0,003	2	40	0,01	0,00
1A2e	CO	0,030	0,074	2	40	0,21	0,06
1A2f	CO	1,893	2,421	2	0	0,34	0,16
1A2gvii	CO	0,133	0,023	2	40	0,06	0,02
1A2gviii	CO	0,064	0,009	2	40	0,03	0,01
1A3ai(i)	CO	0,487	0,393	1	200	5,58	1,08
1A3aii(i)	CO	0,034	0,060	1	200	0,86	0,23
1A3bi	CO	26,701	6,450	1	30	13,75	1,53
1A3bii	CO	5,754	1,143	1	30	2,44	0,50
1A3biii	CO	1,015	0,756	1	30	1,61	0,30
1A3biv	CO	3,751	1,384	1	30	2,95	0,12
1A4bi	CO	0,564	0,522	1	200	7,42	1,56
1A4ci	CO	0,034	0,043	1	100	0,31	0,07
1A4cii	CO	0,067	0,085	1	100	0,61	0,15
2D3c	CO	0,002	0,001	50	20	0,00	0,00
2G	CO	0,211	0,076	100	20	0,55	0,25
3F	CO	2,301	0,134	100	200	2,12	2,85
5C2	CO	0,026	0,038	100	50	0,30	0,13
Total		43,433	14,078			39,560	9,121

Table 140: Pb emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	Pb	0,103	0,093	0	10	0,04	0,01
1A2a	Pb	0,000	0,000	2	40	0,00	0,00
1A2b	Pb	0,000	0,000	2	40	0,00	0,00
1A2c	Pb	0,000	0,001	2	40	0,00	0,00
1A2d	Pb	0,000	0,000	2	40	0,00	0,00
1A2e	Pb	0,000	0,001	2	40	0,00	0,00
1A2f	Pb	0,122	0,161	2	0	0,01	0,01
1A2gviii	Pb	0,000	0,000	2	40	0,00	0,00
1A3bi	Pb	29,500	14,409	1	30	17,17	2,06
1A3bii	Pb	7,660	4,766	1	30	5,68	0,25
1A3biii	Pb	4,097	5,347	1	30	6,37	2,06
1A3biv	Pb	1,313	0,195	1	30	0,23	0,40
1A3bvi	Pb	0,124	0,219	1	0	0,01	0,01
1A4bi	Pb	0,003	0,002	1	200	0,02	0,00
1A4ci	Pb	0,000	0,000	1	100	0,00	0,00
2G	Pb	0,003	0,002	100	20	0,01	0,01
3F	Pb	0,004	0,000	100	200	0,00	0,01
5C2	Pb	0,000	0,000	100	50	0,00	0,00
Total		42,966	25,196			29,536	4,816

Table 141: Cd emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	Cd	0,027	0,024	0	10	4,86	0,94
1A2f	Cd	0,010	0,013	2	0	0,52	0,45
1A3bi	Cd	0,002	0,004	1	30	2,48	1,12
2G	Cd	0,005	0,002	100	20	3,92	3,35
3F	Cd	0,030	0,002	100	200	7,85	41,07
1A4bi	Cd	0,001	0,001	1	200	4,47	0,81
1A3bvi	Cd	0,001	0,001	1	0	0,02	0,02
1A3biii	Cd	0,001	0,001	1	30	0,54	0,18
1A3bii	Cd	0,001	0,001	1	30	0,50	0,10
1A2c	Cd	0,000	0,000	2	40	0,34	0,21
1A2e	Cd	0,000	0,000	2	40	0,26	0,16
1A4cii	Cd	0,000	0,000	1	100	0,16	0,05
5C2	Cd	0,000	0,000	100	50	0,15	0,12
1A3biv	Cd	0,000	0,000	1	30	0,04	0,01
1A2gvii	Cd	0,000	0,000	2	40	0,02	0,03
1A4ci	Cd	0,000	0,000	1	100	0,01	0,00
1A2b	Cd	0,000	0,000	2	40	0,00	0,00
1A2gviii	Cd	0,000	0,000	2	40	0,00	0,00
1A2d	Cd	0,000	0,000	2	40	0,00	0,00
1A2a	Cd	0,000	0,000	2	40	0,00	0,00
Total		0,082	0,050			26,128	48,611

Table 142: Hg emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	Hg	0,008	0,007	0	10	0,81	0,02
1A2a	Hg	0,000	0,000	2	40	0,00	0,00
1A2b	Hg	0,000	0,000	2	40	0,01	0,00
1A2c	Hg	0,000	0,000	2	40	0,01	0,01
1A2d	Hg	0,000	0,000	2	40	0,00	0,00
1A2e	Hg	0,000	0,000	2	40	0,06	0,03
1A2f	Hg	0,061	0,080	2	0	1,82	2,44
1A2gviii	Hg	0,000	0,000	2	40	0,01	0,04
1A3bvi	Hg	0,000	0,000	1	0	0,00	0,00
1A4bi	Hg	0,000	0,000	1	200	0,96	0,07
1A4ci	Hg	0,000	0,000	1	100	0,09	0,02
2G	Hg	0,000	0,000	100	20	0,00	0,00
3F	Hg	0,005	0,000	100	200	0,71	9,26
Total		0,093	0,089			4,464	11,898

Table 143: PCCD/PCCF emissions Uncertainty Calculations

NFR Sector	Pollutant	Base Year (1990)	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		emissions	Gg				
1A1a	PCDD-PCDF	0,057	0,087	0	10	2,18	0,37
1A2a	PCDD-PCDF	0,000	0,000	2	40	0,00	0,00
1A2b	PCDD-PCDF	0,000	0,000	2	40	0,03	0,00
1A2c	PCDD-PCDF	0,000	0,003	2	40	0,34	0,07
1A2d	PCDD-PCDF	0,000	0,000	2	40	0,01	0,00
1A2e	PCDD-PCDF	0,001	0,004	2	40	0,37	0,07
1A2f	PCDD-PCDF	0,006	0,007	2	0	0,04	0,01
1A2gviii	PCDD-PCDF	0,001	0,000	2	40	0,02	0,00
1A3bi	PCDD-PCDF	0,092	0,112	1	30	8,42	1,36
1A3bii	PCDD-PCDF	0,066	0,059	1	30	4,46	0,67
1A3biii	PCDD-PCDF	0,019	0,027	1	30	2,01	0,33
1A3biv	PCDD-PCDF	0,003	0,003	1	30	0,24	0,04
1A4bi	PCDD-PCDF	0,096	0,087	1	200	43,64	6,57
1A4ci	PCDD-PCDF	0,001	0,001	1	100	0,23	0,04
2G	PCDD-PCDF	0,000	0,000	100	20	0,00	0,00
3F	PCDD-PCDF	0,022	0,001	100	200	0,70	0,29
5C2	PCDD-PCDF	0,005	0,007	100	50	1,91	0,48
5E	PCDD-PCDF	0,000	0,000	100	50	0,00	0,00
Total		2,093	0,400			64,593	10,296

Table 144: PAHs emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A1a	PAHs	0,204	0,324	0	10	2,65	0,22
1A2b	PAHs	0,003	0,004	2	40	0,13	0,01
1A2c	PAHs	0,001	0,003	2	40	0,09	0,01
1A2d	PAHs	0,001	0,001	2	40	0,03	0,00
1A2e	PAHs	0,009	0,019	2	40	0,63	0,05
1A2f	PAHs	0,014	0,007	2	0	0,01	0,00
1A2gvii	PAHs	0,002	0,000	2	40	0,01	0,00
1A2gviii	PAHs	0,019	0,003	2	40	0,09	0,00
1A3bi	PAHs	0,007	0,014	1	30	0,35	0,03
1A3bii	PAHs	0,007	0,007	1	30	0,18	0,01
1A3biii	PAHs	0,004	0,006	1	30	0,15	0,01
1A3biv	PAHs	0,000	0,000	1	30	0,01	0,00
1A4bi	PAHs	0,035	0,031	1	200	5,04	0,40
1A4ci	PAHs	0,000	0,000	1	100	0,00	0,00
1A4cii	PAHs	0,001	0,001	1	100	0,09	0,01
2G	PAHs	0,001	0,000	100	20	0,03	0,00
3F	PAHs	13,641	0,792	100	200	144,99	9,84
5C2	PAHs	0,006	0,009	100	50	0,79	0,09
Total		13,957	1,221			155,265	10,698

Table 145: HCB emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A2f	HCB	0,006	0,008	2	0	1,79	0,43
1A3bi	HCB	0,000	0,000	1	30	0,38	0,06
1A3bii	HCB	0,000	0,000	1	30	0,17	0,03
1A3biii	HCB	0,000	0,000	1	30	0,08	0,01
1A3biv	HCB	0,000	0,000	1	30	0,01	0,00
1A4bi	HCB	0,000	0,000	1	200	10,19	1,40
Total		0,049	0,008			13,975	1,935

Table 146: PCBs emissions Uncertainty Calculation

NFR Sector	Pollutant	Base Year (1990) emissions	Year 2015 Emissions	Activity Data Uncertainty	Emission Factor Uncertainty	Combined Uncertainty	Combined Uncertainty as % of Emissions in 2015
		Gg	Gg	%	%	%	%
1A2f	PCBs	0,026	0,034	2	0	1,59	2,37
1A3bi	PCBs	0,000	0,000	1	30	0,03	0,02
1A3bii	PCBs	0,000	0,000	1	30	0,01	0,00
1A3biii	PCBs	0,000	0,000	1	30	0,00	0,00
1A3biv	PCBs	0,000	0,000	1	30	0,00	0,00
1A4bi	PCBs	0,006	0,005	1	200	24,31	5,37
Total		0,040	0,042			29,191	7,767

16. Annex 5: Cyprus Energy Balance 2015

Cyprus Energy Balance 2015

Energy balance for the year 2015 in toe

	Crude oil	LPG	Unleaded 95	Unleaded 98	Unleaded 100	ATF	Kerosene	Diesel S 10 ppm	Biofuels	Gas oil S 0,1%	Marine gas oil	LFO S≤1%	LFO S>1%	HFO S≤1%	HFO S>1%	Electricity from Conventional Fuels	Heating from CHP (Conventional Fuels)	Used Oils	Bitumen	Pet-coke	Coal	Tyres and other fuels	Solar Thermal	Geothermal	Biomass	Electricity fom Biomass	Heating from CHP (Biomass)	Electricity fom wind	Electricity from PV Systems	Total	
Production of primary energy									65								175	0				3046	67857	1551	5621	4406	4445	19080	10893	117138	
Net imports	0	61736	332849.6	20769.86	0	266213.69	9738	289372	9418	239552	88809	14345	0	845514	967	1			20648	94153	3390	6407			18368					2322253	
Change stocks	0	-2832	10181	-1426	0	-245	4429	-307	-2	-55340	0	2677	0	-13382	2897	-1			2968	306		2729	0	0	1372	0				-45975	
Bunkers									0	0	-88809	0	0	0	0															-88809	
Primary Consumption	0	58904	343031	19344	0	265969	14167	289065	9481	184212	0	17022	0	832132	3865	0	175	0	0	97121	3696	12182	67857	1551	25361	4406	4445	19080	10893	2283958	
Energy Conversion-Electricity								0		-94001				-832132	-281	315002															-611411
Non energy use																			-20648				0								-20648
Occupied area by Turkish army																-3															-3
Final consumption	0	58904	343031	19343.66	0	265969	14167	289065	9481	90212	0	17022	0	0	3584	314999	175	0	0	97121	3696	12182	67857	1551	25361	4406	4445	19080	10893	1672544	
Selective consumers																															
Cement industry												429			243		0	0		97121	3696	12182			10234						135160
Road transport			343031	19344	0			264919	9481																						636775
Air transport						265969																									265969
Households (Heating)		40055					10432			49092													57678	1551	8329				1432		294825
Agriculture								24146				511														1189	4445				41310
Industry		5890					1375			14056		15231			3341		175								1690						89929
Commerce, Hotels & Services		12959					2360			27064		851											10179		5108				37	6	208404
Electricity from RES fed to the Grid																										3217		19043	9455		31715

17. Annex 6: Annex IV – Table 1

NFR Sector Emissions 2015 (Template Annex IV-Table 1)

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

<i>NFR sectors to be reported</i>		Main Pollutants (from 1990)				Particulate Matter (from 2000)				Other (from 1990)	Priority Heavy Metals (from 1990)			Additional Heavy Metals (from 1990, voluntary reporting)					
		NOx (as NO ₂)	NMVOOC	SOx (as SO ₂)	NH ₃	PM _{2.5}	PM ₁₀	TSP	BC	CO	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
NFR Code	Longname	kt	kt	kt	kt	kt	kt	kt	kt	kt	t	t	t	t	t	t	t	t	t
1A1a	Public electricity and heat production	4.8446	0.0815	11.3579	NE	0.1964	0.2946	0.3928	0.0110	0.4274	0.0926	0.0244	0.0071	0.0808	0.0529	0.1085	5.1780	0.0419	1.7845
1A1b	Petroleum refining	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1A1c	Manufacture of solid fuels and other energy industries	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0001	0.0000	0.0001	NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0984	0.0048	0.0916	NE	0.0038	0.0038	0.0038	0.0021	0.0127	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0056
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0442	0.0120	0.0387	0.0012	0.0062	0.0063	0.0066	0.0022	0.0242	0.0009	0.0004	0.0000	0.0000	0.0008	0.0002	0.0001	0.0000	0.0193
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0216	0.0011	0.0201	NE	0.0008	0.0008	0.0008	0.0005	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	0.4676	0.0300	0.4336	0.0009	0.0215	0.0216	0.0218	0.0111	0.0737	0.0007	0.0003	0.0001	0.0000	0.0007	0.0003	0.0001	0.0001	0.0387
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	2.1380	0.0376	0.6938	0.0000	0.1105	0.1105	0.1105	0.0619	2.4207	0.1608	0.0131	0.0804	0.0435	0.0673	0.1062	0.0804	0.0415	0.7050
1A2gvi	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	0.0696	0.0072	0.0000	0.0000	0.0044	0.0044	0.0044	0.0027	0.0228	NE	0.0000	NE	NE	0.0001	0.0036	0.0001	0.0000	0.0021
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.0717	0.0035	0.0668	0.0000	0.0028	0.0028	0.0028	0.0016	0.0092	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0041
1A3ai(i)	International aviation LTO (civil)	0.6670	0.0257	0.0508	NE	0.0054	0.0054	0.0054	NA	0.3928	NE	NE	NE	NE	NE	NE	NE	NE	NE
1A3aii(i)	Domestic aviation LTO (civil)	0.0262	0.0056	0.0037	NE	0.0005	0.0005	0.0005	NA	0.0604	NE	NE	NE	NE	NE	NE	NE	NE	NE
1A3bi	Road transport: Passenger cars	1.3584	0.6539	0.0079	0.1946	0.0596	0.0596	0.0596	0.0385	6.4500	14.4087	0.0041	NE	NE	0.0072	0.0152	0.0049	0.0001	0.8308
1A3bii	Road transport: Light duty vehicles	1.2711	0.1203	0.0019	0.0029	0.1110	0.1110	0.1110	0.0742	1.1430	4.7662	0.0008	NE	NE	0.0027	0.0022	0.0009	0.0000	0.1678
1A3biii	Road transport: Heavy duty vehicles and buses	3.0168	0.1636	0.0021	0.0015	0.0779	0.0779	0.0779	0.0475	0.7558	5.3472	0.0009	NE	NE	0.0031	0.0022	0.0009	0.0000	0.1795
1A3biv	Road transport: Mopeds & motorcycles	0.0402	0.3885	0.0001	0.0004	0.0062	0.0062	0.0062	0.0011	1.3839	0.1954	0.0001	NE	NE	0.0001	0.0002	0.0001	0.0000	0.0127
1A3bv	Road transport: Gasoline evaporation	NA	1.1816	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE
1A3bvi	Road transport: Automobile tyre and brake wear	NA	NA	NA	NA	0.0848	0.1587	0.2083	NA	NE	0.2192	0.0010	0.0000	0.0000	0.0813	1.7794	0.0128	0.0017	0.6735
1A3bvii	Road transport: Automobile road abrasion	NA	NA	NA	NA	NE	NE	NE	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
1A3c	Railways	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1A3di(ii)	International inland waterways	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1A3dii	National navigation (shipping)	0.1285	0.0093	0.1266	NE	0.0164	0.0164	0.0164	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1A3ei	Pipeline transport	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1A3eii	Other (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		Main Pollutants (from 1990)				Particulate Matter (from 2000)				Other (from 1990)	Priority Heavy Metals (from 1990)			Additional Heavy Metals (from 1990, voluntary reporting)					
		NOx (as NO ₂)	NMVOOC	SOx (as SO ₂)	NH ₃	PM _{2.5}	PM ₁₀	TSP	BC	CO	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
NFR Code	Longname	kt	kt	kt	kt	kt	kt	kt	kt	kt	t	t	t	t	t	t	t	t	
1A4ai	Commercial/institutional: Stationary	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	
1A4aii	Commercial/institutional: Mobile	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	
1A4bi	Residential: Stationary	0.1663	0.0538	0.1503	0.0060	0.0696	0.0713	0.0748	0.0069	0.5223	0.0024	0.0011	0.0004	0.0000	0.0026	0.0009	0.0002	0.0000	0.0454
1A4bii	Residential: Household and gardening (mobile)	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.3350	0.0163	0.0312	NE	0.0131	0.0131	0.0131	0.0073	0.0431	0.0001	0.0000	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0189
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	0.2733	0.0263	0.0156	0.0001	0.0136	0.0136	0.0136	NA	0.0853	NE	0.0001	NE	NE	0.0004	0.0133	0.0005	0.0001	0.0078
1A4ciii	Agriculture/Forestry/Fishing: National fishing	0.0012	0.0001	0.0012	NE	0.0002	0.0002	0.0002	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1A5a	Other stationary (including military)	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
1A5b	Other, Mobile (including military, land based and recreational boats)	0.0478	0.0031	0.0591	NE	0.0071	0.0071	0.0071	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1B1a	Fugitive emission from solid fuels: Coal mining and handling	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B1b	Fugitive emission from solid fuels: Solid fuel transformation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B1c	Other fugitive emissions from solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B2ai	Fugitive emissions oil: Exploration, production, transport	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B2aiv	Fugitive emissions oil: Refining / storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B2av	Distribution of oil products	NA	0.7822	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B2c	Venting and flaring (oil, gas, combined oil and gas)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1B2d	Other fugitive emissions from energy production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2A1	Cement production	NE	NE	NE	NE	0.05533	0.0881	0.0889	0.0017	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2A2	Lime production	NE	NE	NE	NA	0.0023	0.0116	0.0300	0.0000	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA
2A3	Glass production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2A5a	Quarrying and mining of minerals other than coal	NA	NA	NA	NA	0.0169	0.1222	0.2354	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2A5b	Construction and demolition	NA	NE	NA	NA	0.0072	0.0715	0.1427	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2A5c	Storage, handling and transport of mineral products	NA	NA	NA	NA	0.0025	0.0251	0.0502	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2A6	Other mineral products (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

<i>NFR sectors to be reported</i>		Main Pollutants (from 1990)				Particulate Matter (from 2000)				Other (from 1990)	Priority Heavy Metals (from 1990)			Additional Heavy Metals (from 1990, voluntary reporting)				
		NO _x (as NO ₂)	NM VOC	SO _x (as SO ₂)	NH ₃	PM _{2.5}	PM ₁₀	TSP	BC	CO	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
NFR Code	Longname	kt	kt	kt	kt	kt	kt	kt	kt	kt	t	t	t	t	t	t	t	t
2B1	Ammonia production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B2	Nitric acid production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B3	Adipic acid production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B5	Carbide production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B6	Titanium dioxide production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B7	Soda ash production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B10a	Chemical industry: Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2B10b	Storage, handling and transport of chemical products	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C1	Iron and steel production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C2	Ferroalloys production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C3	Aluminium production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C4	Magnesium production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C5	Lead production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C6	Zinc production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C7a	Copper production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C7b	Nickel production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C7c	Other metal production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2C7d	Storage, handling and transport of metal products	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2D3a	Domestic solvent use including fungicides	NA	0.2027	NA	NA	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2D3b	Road paving with asphalt	NE	0.0023	NE	NA	0.0001	0.0005	0.0020	0.0000	NE	NA	NA	NA	NA	NA	NA	NA	NA
2D3c	Asphalt roofing	NE	0.0098	NA	NA	0.0030	0.0226	0.1207	0.0000	0.0007	NE	NE	NE	NA	NA	NA	NA	NA
2D3d	Coating applications	NA	1.6173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2D3e	Degreasing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2D3f	Dry cleaning	NA	0.0527	NA	NA	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2D3g	Chemical products	NE	0.0099	NE	NE	NE	NE	NE	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		Main Pollutants (from 1990)				Particulate Matter (from 2000)				Other (from 1990)	Priority Heavy Metals (from 1990)			Additional Heavy Metals (from 1990, voluntary reporting)					
		NO _x (as NO ₂)	NM VOC	SO _x (as SO ₂)	NH ₃	PM _{2.5}	PM ₁₀	TSP	BC	CO	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
NFR Code	Longname	kt	kt	kt	kt	kt	kt	kt	kt	kt	t	t	t	t	t	t	t	t	t
2D3h	Printing	NA	0.2472	NA	NA	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2D3i	Other solvent use (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2G	Other product use (please specify in the IIR)	0.0025	0.0067	0.0000	0.0057	0.0373	0.0374	0.0374	0.0002	0.0758	0.0016	0.0019	0.0000	0.0000	0.0000	0.0083	0.0038	NE	0.0042
2H1	Pulp and paper industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2H2	Food and beverages industry	NA	0.1561	NA	NA	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2H3	Other industrial processes (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2I	Wood processing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2J	Production of POPs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2K	Consumption of POPs and heavy metals (e.g. electrical and scientific equipment)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2L	Other production, consumption, storage, transportation or handling of bulk products	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3B1a	Manure management - Dairy cattle	0.0032	0.2077	NA	1.0741	0.0053	0.0081	0.0178	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B1b	Manure management - Non-dairy cattle	0.0012	0.1283	NA	0.3873	0.0030	0.0045	0.0097	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B2	Manure management - Sheep	0.0005	0.0193	NA	0.2456	0.0001	0.0005	0.0012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B3	Manure management - Swine	0.0070	0.1585	NA	1.3788	0.0118	0.0633	0.1417	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4a	Manure management - Buffalo	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3B4d	Manure management - Goats	0.0004	0.0105	NA	0.1773	0.0001	0.0004	0.0009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4e	Manure management - Horses	0.0003	0.0162	NA	0.0573	0.0002	0.0003	0.0006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4f	Manure management - Mules and asses	0.0004	0.0096	NA	0.0767	0.0002	0.0003	0.0006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4gi	Manure management - Laying hens	0.0012	0.0446	NA	0.2882	0.0070	0.0389	0.0328	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4gii	Manure management - Broilers	0.0032	0.2161	NA	0.2773	0.0119	0.0899	0.0899	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4giii	Manure management - Turkeys	0.0000	0.0027	NA	0.0046	0.0002	0.0012	0.0012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3B4giv	Manure management - Other poultry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3B4h	Manure management - Other animals (please specify in IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3Da1	Inorganic N-fertilizers (includes also urea application)	0.1657	0.0287	NA	0.3366	0.0020	0.0521	0.0521	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3Da2a	Animal manure applied to soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

<i>NFR sectors to be reported</i>		Main Pollutants (from 1990)				Particulate Matter (from 2000)				Other (from 1990)	Priority Heavy Metals (from 1990)			Additional Heavy Metals (from 1990, voluntary reporting)					
		NO_x (as NO₂)	NM VOC	SO_x (as SO₂)	NH₃	PM_{2.5}	PM₁₀	TSP	BC	CO	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
NFR Code	Longname	kt	kt	kt	kt	kt	kt	kt	kt	kt	t	t	t	t	t	t	t	t	t
3Da2b	Sewage sludge applied to soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
3Da2c	Other organic fertilisers applied to soils (including compost)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
3Da3	Urine and dung deposited by grazing animals	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
3Da4	Crop residues applied to soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
3Db	Indirect emissions from managed soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
3Dc	Farm-level agricultural operations including storage, handling and transport of agricultural products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3Dd	Off-farm storage, handling and transport of bulk agricultural products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3De	Cultivated crops	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3Df	Use of pesticides	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3F	Field burning of agricultural residues	0.0046	0.0010	0.0010	0.0048	0.0108	0.0114	0.0116	0.0010	0.1336	0.0002	0.0018	0.0003	0.0000	0.0002	0.0001	0.0001	0.0000	0.0011
3I	Agriculture other (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5A	Biological treatment of waste - Solid waste disposal on land	NA	0.6287	NA	NE	0.0133	0.0883	0.1866	NA	NE	NA	NA	NE	NA	NA	NA	NA	NA	NA
5B1	Biological treatment of waste - Composting	NE	NE	NE	0.0187	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C1a	Municipal waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C1bi	Industrial waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C1bii	Hazardous waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C1biii	Clinical waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C1biv	Sewage sludge incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C1bv	Cremation	NE	NE	NE	NE	0.0001	0.0001	0.0001	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
5C1bv	Other waste incineration (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5C2	Open burning of waste	0.0022	0.0008	0.0001	NE	0.0029	0.0031	0.0032	0.0012	0.0382	0.0003	0.0001	NE	0.0003	0.0000	0.0001	NE	0.0000	0.0127

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

<i>NFR sectors to be reported</i>		Main Pollutants (from 1990)				Particulate Matter (from 2000)				Other (from 1990)	Priority Heavy Metals (from 1990)			Additional Heavy Metals (from 1990, voluntary reporting)					
		NO _x (as NO ₂)	NM _{VOC}	SO _x (as SO ₂)	NH ₃	PM _{2.5}	PM ₁₀	TSP	BC	CO	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
NFR Code	Longname	kt	kt	kt	kt	kt	kt	kt	kt	kt	t	t	t	t	t	t	t	t	
5D1	Domestic wastewater handling	NA	0.0005	NA	NE	NE	NE	NE	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	
5D2	Industrial wastewater handling	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	
5D3	Other wastewater handling	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
5E	Other waste (please specify in IIR)	NE	NE	NE	NE	0.0004	0.0004	0.0004	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	
6A	Other (included in national total for entire territory) (please specify in IIR)	NO	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO	NO	NO	NO	NO	NO	NO	
NATIONAL TOTAL	National total for the entire territory (based on fuel sold)	15.2801	7.38561	13.1543	4.5406	1.0056	1.7275	2.3950	0.2726	14.0784	25.1962	0.0502	0.0885	0.1247	0.2196	2.0411	5.2828	0.0857	4.5149
ADJUSTMENT S (Net total)	Sum of adjustments (negative value) from Annex VII	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
NATIONAL TOTAL FOR COMPLIANCE	National total for compliance assessment (please specify all details in the IIR)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
1A3ai(ii)	International aviation cruise (civil)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
1A3aii(ii)	Domestic aviation cruise (civil)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
1A3di(i)	International maritime navigation	0.9988	0.0770	0.9302	NE	0.1207	0.1207	0.1207	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
1A5c	Multilateral operations	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
1A3	Transport (fuel used)	5.6865	1.3262	0.0120	0.1994	0.2548	0.2548	0.2548	NA	9.7327	24.7174	0.0059	NE	NE	0.0132	0.0198	0.0067	0.0001	1.1908
6B	Other not included in national total of the entire territory (please specify in the IIR)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
11A	Volcanoes	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
11B	Forest fires	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
11C	Other natural emissions (please specify in the IIR)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)						
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4									
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV		
1A1a	Public electricity and heat production	0.0873	0.0000	0.1616	0.1616	0.0002	0.3235	0.0000	0.0000	39662	NO	NO	NO	NO	NO	TJ NCV
1A1b	Petroleum refining	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	TJ NCV
1A1c	Manufacture of solid fuels and other energy industries	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	TJ NCV
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel	0.0000	0.0000	0.0000	0.0000	0.0000	NO	NE	NE	5	NE	NE	NE	NE	NA	TJ NCV
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals	0.0003	0.0004	0.0029	0.0003	0.0003	0.0039	NE	NE	192	NE	NE	NE	NE	NA	TJ NCV
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals	0.0034	0.0005	0.0017	0.0003	0.0003	0.0028	0.0002	0.0020	80	NE	NE	33	NE	NA	TJ NCV
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.0001	0.0001	0.0006	0.0001	0.0001	0.0008	NE	NE	42	NE	NE	NE	NE	NA	TJ NCV
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and	0.0037	0.0020	0.0140	0.0017	0.0015	0.0191	0.0001	0.0015	907	NE	NE	24	NE	NA	TJ NCV
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	0.0072	0.0007	0.0053	0.0007	0.0006	0.0073	0.0075	0.0338	158	NE	NE	0	NE	NA	TJ NCV
1A2gvi	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)	NE	0.0001	0.0001	0.0001	0.0000	0.0003	NA	NA	89	NE	NE	NE	NE	NA	TJ NCV
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	0.0002	0.0003	0.0021	0.0002	0.0002	0.0028	0.0000	0.0000	140	NE	NE	0	NE	NA	TJ NCV
1A3ai(i)	International aviation LTO (civil)	NE	NE	NE	NE	NE	NE	NA	NA	NE	NE	NE	NE	NE	40978	Number of LTO's
1A3aii(i)	Domestic aviation LTO (civil)	NE	NE	NE	NE	NE	NE	NA	NA	NE	NE	NE	NE	NE	12458	Number of LTO's
1A3bi	Road transport: Passenger cars	0.1122	0.0035	0.0040	0.0030	0.0038	0.0143	0.0001	0.0000	16689	NA	NE	0	NA	NA	TJ NCV
1A3bii	Road transport: Light duty vehicles	0.0595	0.0019	0.0021	0.0016	0.0018	0.0074	0.0000	0.0000	4039	NA	NE	0	NA	NA	TJ NCV
1A3biii	Road transport: Heavy duty vehicles and buses	0.0267	0.0004	0.0025	0.0027	0.0006	0.0062	0.0000	0.0000	4206	NA	NE	0	NA	NA	TJ NCV
1A3biv	Road transport: Mopeds & motorcycles	0.0032	0.0001	0.0001	0.0000	0.0001	0.0003	0.0000	0.0000	259	NA	NE	0	NA	NA	TJ NCV
1A3bv	Road transport: Gasoline evaporation	NE	NE	NE	NE	NA	NA	NA	NE	NE	NA	NA	NA	NA	NA	TJ NCV
1A3bvi	Road transport: Automobile tyre and brake wear	NE	NE	NE	NE	NE	NE	NA	NE	7479	NA	NA	0	NA	NE	10^6 km
1A3bvii	Road transport: Automobile road abrasion	NE	NE	NE	NE	NE	NE	NA	NE	NA	NA	NA	NA	NA	NE	10^6 km
1A3c	Railways	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	TJ NCV
1A3di(ii)	International inland waterways	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	TJ NCV
1A3dii	National navigation (shipping)	NE	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	839	Number of Vessels called at ports
1A3ei	Pipeline transport	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	TJ NCV
1A3eii	Other (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	TJ NCV

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)						
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4									
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV		
1A4ai	Commercial/institutional: Stationary	IE	IE	IE	IE	IE	IE	IE	IE	IE	NA	NO	NA	NA	NA	TJ NCV
1A4aii	Commercial/institutional: Mobile	IE	IE	IE	IE	IE	IE	IE	IE	IE	NO	NO	NO	NO	NA	TJ NCV
1A4bi	Residential: Stationary	0.0873	0.0107	0.0097	0.0038	0.0066	0.0308	0.0004	0.0052	3126	NO	NO	86	NO	NA	TJ NCV
1A4bii	Residential: Household and gardening (mobile)	IE	IE	IE	IE	IE	IE	IE	IE	IE	NO	NO	IE	NO	NA	TJ NCV
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	NE	NE	653	NO	NO	NO	NO	NA	TJ NCV
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	NE	0.0002	0.0004	0.0003	0.0001	0.0011	NA	NA	327	NA	NA	NO	NE	NA	TJ NCV
1A4ciii	Agriculture/Forestry/Fishing: National fishing	NE	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	22	Number of Vessels called at ports
1A5a	Other stationary (including military)	IE	IE	IE	IE	IE	IE	IE	IE	IE	NA	NA	NA	NA	NA	TJ NCV
1A5b	Other, Mobile (including military, land based and recreational boats)	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	206	Number of Vessels called at ports
1B1a	Fugitive emission from solid fuels: Coal mining and handling	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Coal produced [Mt]
1B1b	Fugitive emission from solid fuels: Solid fuel transformation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Coal used for transformation [Mt]
1B1c	Other fugitive emissions from solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
1B2ai	Fugitive emissions oil: Exploration, production, transport	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Crude oil produced [Mt]
1B2aiv	Fugitive emissions oil: Refining / storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Crude oil refined [Mt]
1B2av	Distribution of oil products	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	Oil consumed [Mt]
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Gas throughput [Mn3]
1B2c	Venting and flaring (oil, gas, combined oil and gas)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Gas vented flared [TJ]
1B2d	Other fugitive emissions from energy production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
2A1	Cement production	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	1641	Clinker produced [kt]
2A2	Lime production	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	Lime produced [kt]
2A3	Glass production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Glass produced [t]
2A5a	Quarrying and mining of minerals other than coal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	Material quarried [Mt]
2A5b	Construction and demolition	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2820	floor space constructed/demolished [M3]
2A5c	Storage, handling and transport of mineral products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	Amount [Mt]
2A6	Other mineral products (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)						
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4									
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV		
1A4ai	Commercial/institutional: Stationary	IE	IE	IE	IE	IE	IE	IE	IE	IE	NA	NO	NA	NA	NA	TJ NCV
1A4aii	Commercial/institutional: Mobile	IE	IE	IE	IE	IE	IE	IE	IE	IE	NO	NO	NO	NO	NA	TJ NCV
1A4bi	Residential: Stationary	0.0873	0.0107	0.0097	0.0038	0.0066	0.0308	0.0004	0.0052	3126	NO	NO	86	NO	NA	TJ NCV
1A4bii	Residential: Household and gardening (mobile)	IE	IE	IE	IE	IE	IE	IE	IE	IE	NO	NO	IE	NO	NA	TJ NCV
1A4ci	Agriculture/Forestry/Fishing: Stationary	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	NE	NE	653	NO	NO	NO	NO	NA	TJ NCV
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	NE	0.0002	0.0004	0.0003	0.0001	0.0011	NA	NA	327	NA	NA	NO	NE	NA	TJ NCV
1A4ciii	Agriculture/Forestry/Fishing: National fishing	NE	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	22	Number of Vessels called at ports
1A5a	Other stationary (including military)	IE	IE	IE	IE	IE	IE	IE	IE	IE	NA	NA	NA	NA	NA	TJ NCV
1A5b	Other, Mobile (including military, land based and recreational boats)	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	206	Number of Vessels called at ports
1B1a	Fugitive emission from solid fuels: Coal mining and handling	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Coal produced [Mt]
1B1b	Fugitive emission from solid fuels: Solid fuel transformation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Coal used for transformation [Mt]
1B1c	Other fugitive emissions from solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
1B2ai	Fugitive emissions oil: Exploration, production, transport	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Crude oil produced [Mt]
1B2aiv	Fugitive emissions oil: Refining / storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Crude oil refined [Mt]
1B2av	Distribution of oil products	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	Oil consumed [Mt]
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Gas throughput [Mn3]
1B2c	Venting and flaring (oil, gas, combined oil and gas)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Gas vented flared [TJ]
1B2d	Other fugitive emissions from energy production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
2A1	Cement production	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA	1641	Clinker produced [kt]
2A2	Lime production	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	Lime produced [kt]
2A3	Glass production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Glass produced [t]
2A5a	Quarrying and mining of minerals other than coal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	Material quarried [Mt]
2A5b	Construction and demolition	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2820	floor space constructed/demolished [M3]
2A5c	Storage, handling and transport of mineral products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	Amount [Mt]
2A6	Other mineral products (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)							
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units	
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4										
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV			
2B1	Ammonia production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Ammonia produced [kt]
2B2	Nitric acid production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Nitric acid produced [kt]
2B3	Adipic acid production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Adipic acid produced [kt]
2B5	Carbide production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Carbide produced [kt]
2B6	Titanium dioxide production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Titanium dioxide produced [kt]
2B7	Soda ash production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Soda ash produced [kt]
2B10a	Chemical industry: Other (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
2B10b	Storage, handling and transport of chemical products (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
2C1	Iron and steel production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Steel produced [kt]
2C2	Ferroalloys production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Ferroalloys produced [kt]
2C3	Aluminium production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Aluminium produced [kt]
2C4	Magnesium production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Magnesium produced [kt]
2C5	Lead production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Lead produced [kt]
2C6	Zinc production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Zinc produced [kt]
2C7a	Copper production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Copper produced [kt]
2C7b	Nickel production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Nickel produced [kt]
2C7c	Other metal production (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
2C7d	Storage, handling and transport of metal products (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Amount (kt)
2D3a	Domestic solvent use including fungicides	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	848300	Population
2D3b	Road paving with asphalt	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	151	Asphalt Production [kt]
2D3c	Asphalt roofing	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	75	Shingle(kt)
2D3d	Coating applications	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	Paint applied [kt]
2D3e	Degreasing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Solvents used [kt]
2D3f	Dry cleaning	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	Solvents used [kt]
2D3g	Chemical products	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3	Paint produced [kt]

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)						
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4									
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV		
2D3h	Printing	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	Printing ink used [kt]
2D3i	Other solvent use (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
2G	Other product use (please specify in the IIR)	0.0000	0.0002	0.0001	0.0001	0.0001	0.0003	NE	NE	NA	NA	NA	NA	NA	1	Tobacco combustion kt]
2H1	Pulp and paper industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Pulp production [kt]
2H2	Food and beverages industry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	138	Bread, Wine, Beer, Spirits production [kt]
2H3	Other industrial processes (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
2I	Wood processing	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
2J	Production of POPs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA
2K	Consumption of POPs and heavy metals (e.g. electrical and scientific equipment)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2L	Other production, consumption, storage, transportation or handling of bulk products (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA
3B1a	Manure management - Dairy cattle	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26	Population size (1000 head)
3B1b	Manure management - Non-dairy cattle	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	33	Population size (1000 head)
3B2	Manure management - Sheep	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	214	Population size (1000 head)
3B3	Manure management - Swine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	152	Population size (1000 head)
3B4a	Manure management - Buffalo	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Population size (1000 head)
3B4d	Manure management - Goats	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	155	Population size (1000 head)
3B4e	Manure management - Horses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	Population size (1000 head)
3B4f	Manure management - Mules and asses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7	Population size (1000 head)
3B4gi	Manure management - Laying hens	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	540	Population size (1000 head)
3B4gii	Manure management - Broilers	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2605	Population size (1000 head)
3B4giii	Manure management - Turkeys	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	Population size (1000 head)
3B4giv	Manure management - Other poultry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Population size (1000 head)
3B4h	Manure management - Other animals (please specify in IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Population size (1000 head)
3Da1	Inorganic N-fertilizers (includes also urea application)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4156000	Use of inorganic fertilizers (kg N/yr)
3Da2a	Animal manure applied to soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants																
NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)						
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4									
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV		
3Da2b	Sewage sludge applied to soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
3Da2c	Other organic fertilisers applied to soils (including compost)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
3Da3	Urine and dung deposited by grazing animals	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
3Da4	Crop residues applied to soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
3Db	Indirect emissions from managed soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
3Dc	On-farm agricultural operations including storage, handling and transport of agricultural products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	
3Dd	Off-farm storage, handling and transport of bulk agricultural products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	
3De	Cultivated crops	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
3Df	Use of pesticides	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
3F	Field burning of agricultural residues	0.0013	0.1356	0.3788	0.1617	0.1160	0.7920	NE	NE	NA	NA	NA	NA	NA	25	Area burned [k ha/yr]
3I	Agriculture other (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NA
5A	Biological treatment of waste - Solid waste disposal on land	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	403	Annual deposition of MSW at the SWDS [kt]
5B1	Biological treatment of waste - Composting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	78	Annual composting of SWDS [kt]
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
5C1a	Municipal waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	MSW incinerated [kt]
5C1bi	Industrial waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Waste incinerated [kt]
5C1bii	Hazardous waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Waste incinerated [kt]
5C1biii	Clinical waste incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Waste incinerated [kt]
5C1biv	Sewage sludge incineration	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
5C1bv	Cremation	NE	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	121	Incineration of corpses [Number]
5C1bvi	Other waste incineration (please specify in the IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
5C2	Open burning of waste	0.0068	0.0016	0.0032	0.0039	NE	0.0086	NE	NA	NA	NA	NA	NA	NA	1	Amount of waste burned [kt]

TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants

NFR sectors to be reported		POPs ⁽¹⁾ (from 1990)								Activity Data (from 1990)						
		PCDD/ PCDF (dioxins/ furans)	PAHs					HCB	PCBs	Liquid Fuels	Solid Fuels	Gaseous Fuels	Biomass	Other Fuels	Other activity (specified)	Other Activity Units
			benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3- cd) pyrene	Total 1-4									
NFR Code	Longname	g I-TEQ	t	t	t	t	t	kg	kg	TJ NCV	TJ NCV	TJ NCV	TJ NCV	TJ NCV		
5D1	Domestic wastewater handling	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	32106138	Waste water handled [m3/yr]
5D2	Industrial wastewater handling	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	NA	Total organic product [Gg DC/yr]
5D3	Other wastewater handling	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Total organic product [Gg DC/yr]
5E	Other waste (please specify in IIR)	0.0000	NE	NE	NE	NE	NE	NE	NE	NA	NA	NA	NA	NA	NE	Please specify
6A	Other (included in national total for entire territory) (please specify in IIR)	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA	NA	NA	NA	188	Accidental car fires(cases)
NATIONAL TOTAL	National total for the entire territory (based on fuel sold)	0.3999	0.1581	0.5891	0.3422	0.1321	1.2214	0.0084	0.0425	NE	NE	NE	NE	NE	NE	NA
ADJUSTMEN TS (Net total)	Sum of adjustments (negative value) from Annex VII	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
NATIONAL TOTAL FOR COMPLIANCE	National total for compliance assessment (please specify all details in the IIR)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
1A3ai(ii)	International aviation cruise (civil)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	TJ NCV
1A3aii(ii)	Domestic aviation cruise (civil)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	TJ NCV
1A3di(i)	International maritime navigation	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	TJ NCV
1A5c	Multilateral operations	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
1A3	Transport (fuel used)	0.2015	0.0059	0.0086	0.0074	0.0062	0.0282	NE	NE	NE	NE	NE	NE	NE	NE	
6B	Other not included in national total of the entire territory (please specify in the IIR)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NA
11A	Volcanoes	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Please specify
11B	Forest fires	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Area of forest burned [ha]
11C	Other natural emissions (please specify in the IIR)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	