

Annual European Community LRTAP Convention Emission Inventory 1990–2004

Submission to EMEP through the Executive Secretary of the UNECE

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Summary

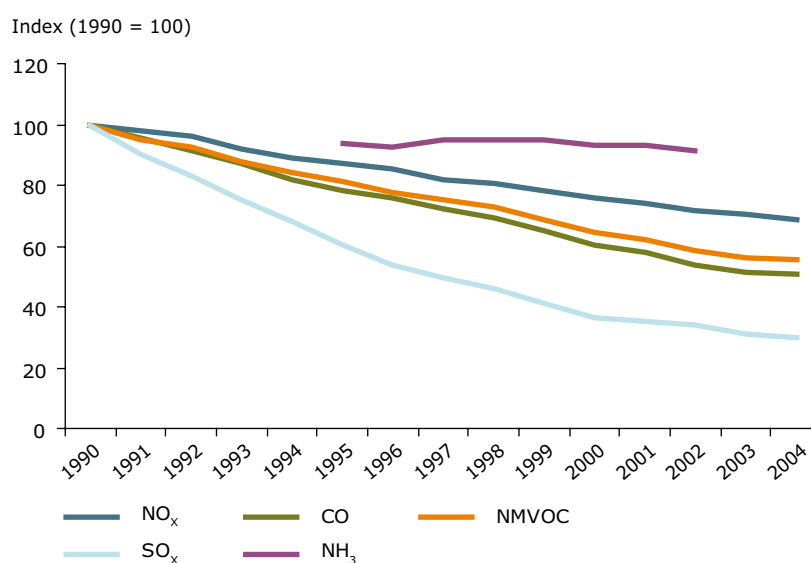
This report is the annual European Community LRTAP Convention Emission Inventory presenting the European Community air pollution data from the years 1990 to 2004. The report provides an overview of emission trends and data availability for EU-25; NFR Tables IV 1A are provided for EU-15 only. Due to data gaps, EU-15 totals were estimated for NO_x, CO, NMVOCs and SO_x covering 1990 to 2004, and NH₃ was estimated for certain years. Data reported for particulate matter (PM), persistent organic pollutants (POPs) and heavy metals (HM) are presented in Annex F.

The figure and table below show the EU-15 emission trends for NO_x, CO, NMVOCs and SO_x between

1990 and 2004, and for NH₃ for 1990 and 1995–2002. The largest reductions in relative terms were in SO_x emissions (70 %), followed by CO (50 %), NMVOC (45 %) and NO_x (31 %). NH₃ emissions decreased by 8 % between 1990 and 2002.

This report also shows the data availability of the emission data under the European Community directive on national emission ceilings for certain atmospheric pollutants (NEC directive 2001/81/EC). This year, for the first time, more detailed information is given for key source categories (see Chapter 2.2), recalculations of NEC data (see Chapter 4.4) and differences of data reported under LRTAP Convention and NEC (see Chapter 4.6).

EU-15 emission trends for NO_x, CO, NMVOCs, SO_x between 1990 and 2004, and for NH₃ in 1990 and 1995–2002



Total EU-15 emissions of NO_x, CO, NMVOCs, SO_x and NH₃ in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
NO _x	13 504	13 198	12 975	12 389	12 041	11 801	11 516	11 067	10 866	10 550	10 231	10 009	9 673	9 537	9 289
CO	51 129	48 842	46 743	44 440	41 839	39 948	38 631	36 858	35 299	33 245	30 777	29 504	27 518	26 371	25 809
NMVOC	14 185	13 491	13 145	12 480	11 917	11 478	10 994	10 662	10 317	9 771	9 177	8 780	8 331	7 990	7 847
SO _x	16 491	14 882	13 705	12 450	11 239	9 935	8 868	8 135	7 599	6 750	6 018	5 812	5 599	5 145	4 951
NH ₃	3 649	NE	NE	NE	NE	3 417	3 380	3 453	3 464	3 457	3 405	3 394	3 342	NE	NE

Note: Notation key NE stands for 'not estimated'.

1 Introduction to the EU Long-range Transboundary Air Pollution Inventory

1.1 Background information on the Inventory

The United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution (UNECE LRTAP Convention) was ratified (approved) by the European Community in 1982. Article 2 of the convention states that 'the Contracting Parties, taking due account of the facts and problems involved, are determined to protect man and his environment against air pollution and shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution.'

The Convention set up a process for negotiating concrete measures to control specific pollutants through legally binding protocols. Since 1984, eight protocols have entered into force. The 1999 Protocol to abate acidification, eutrophication and ground-level ozone entered into force on 17 May 2005. Table 1 below presents the status of ratification

of each protocol by the European Community. The status differs in the individual Member States.

Under the Convention, the reporting of air emission data is important for assessing the state of air pollution in the UNECE region and for ascertaining the compliance of the parties with their commitments. This report follows the data request as outlined in the letter of the UNECE Environment and Human Settlements Division (the secretariat for the executive body of the Convention) from 14 December 2005, asking the European Community to report its 2004 emission data on SO_x (as SO₂), NO_x (as NO₂), NH₃, NMVOCs, CO, heavy metals (HMs), persistent organic pollutants (POPs) and particulate matter (PM). The report provides an overview of emission trends and data availability for EU-25; NFR Tables IV 1A are provided for EU-15 only. This report was prepared by the European Environment Agency and its European Topic Centre on Air and Climate Change (EEA/ETC-ACC) on behalf of the European Commission.

Table 1 European Community's status of ratification of the LRTAP Convention and related protocols

Convention/Protocol	Status
The 1979 Convention on Long-range Transboundary Air Pollution	Signed and ratified (approval)
The 1984 Protocol on long-term financing of the cooperative programme for monitoring and evaluation of the long-range transmissions of air pollutants in Europe	Signed and ratified (approval)
The 1985 Protocol on the reduction of sulphur emissions or their transboundary fluxes by at least 30 percent	
The 1988 Protocol concerning the control of emissions of nitrogen oxides or their transboundary fluxes	Ratified (accession)
The 1991 Protocol concerning the control of emissions of volatile organic compounds or their transboundary fluxes	Signed
The 1994 Protocol on further reduction of sulphur emissions	Signed and ratified (approval)
The 1998 Protocol on persistent organic pollutants	Signed and ratified (approval)
The 1998 Protocol on heavy metals	Signed and ratified (approval)
The 1999 Protocol to abate acidification, eutrophication and ground-level ozone	Ratified (accession)

Throughout this report, the European Community refers to the 25 Member States: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. EU-15 refers to the 15 Member States up until 1 May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

1.2 A description of the institutional arrangements for inventory preparation

There is no directive to monitor the air emissions and the preparation of the air emission inventories for the LRTAP Convention. The legal reporting obligation for the Member States and the European Community remains the 1979 LRTAP Convention. Within the European Community, Member States are requested to post a copy of their official submission to LRTAP Convention in the central data repository of the European environmental information system (Eionet ⁽¹⁾) by 15 February of each year. EEA-ETC/ACC collects the data from the central data repository and compiles the European Community LRTAP Convention Inventory database, producing a European Community CLRTAP Inventory and Inventory report.

Additionally, a European Community directive, the NEC Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants ⁽²⁾, requests the European Community Member States to report by 31 December each year to the European Commission and to the EEA their national emission inventories for SO₂, NO_x, NMVOCs and NH₃, and their emission projections for 2010. They have to report their final emission inventories for the year before last and their provisional emission inventories for the previous year.

The Member States also report their NO_x, CO, NMVOC, SO₂ emissions under the greenhouse gas monitoring mechanism for the United Nations Framework Convention on Climate Change (UNFCCC) ⁽³⁾. Table 2 provides an overview of air pollution reporting obligations for the European Community Member States.

Within this legal framework, preparing the LRTAP Convention Inventory involves Member States providing their data, the European Commission receiving the data, and the EEA and its ETC-ACC collecting the data and preparing the actual Inventory.

Flowchart diagrams illustrating the dataflow necessary to compile the EU LRTAP Convention and NEC emission inventories are presented in Figures 1 and 2.

1.3 General description of methods and data sources used

The European Community LRTAP Convention Inventory is the sum of the Member States' inventories. The methods used by the Member States are based on the joint EMEP/CORINAIR (Emission Inventory) guidebook ⁽⁴⁾. For the Inventory prepared in 2006, 23 out of 25 EU Member States provided LRTAP Convention data. Table 3 provides an overview of available emission data submissions at the EEA by 23 June 2006.

Table 4 shows which countries submitted new national LRTAP Convention Informative Inventory Reports (IIRs) and which years are covered in the report.

1.4 Information on the quality assurance and quality control plan

There is no formal quality assurance and quality control (QA/QC) plan available for the EC Inventory.

⁽¹⁾ Council Regulation (EC) No 933/1999 of 29 April 1999 amending Regulation (EEC) No 1210/90 on the establishment of the European Environment Agency and Eionet. Eionet is an extended network consisting of the EEA as central node (supported by European Topic Centres) and national institutions in the EEA member countries that supply and/or analyse national data on the environment.

⁽²⁾ OJ L 309, 27.11.2001, p. 22.

⁽³⁾ OJ L 49, 19.2.2004, p. 1. Council Decision 280/2004/EC.

⁽⁴⁾ EMEP/CORINAIR Emission Inventory guidebook. Latest version available third edition, October 2003 update, EEA Technical report No 30. Prepared by the EMEP Task Force on Emission Inventories. Internet site: <http://reports.eea.eu.int/EMEP/CORINAIR4>.

The main activities enhancing the quality of the Inventory are the checks by EEA-ETC/ACC on the status of each submission. For this purpose, the EEA-ETC/ACC fills out a status report form similar to that of the UNFCCC (included in Annex B of this report).

All inventory documents (submissions, inventory masterfile, inventory report, status reports and

related correspondence) are archived electronically at the EEA-ETC/ACC.

More detailed quality assurance activities are performed by the EEA-ETC/ACC and EMEP (European monitoring evaluation programme) in an annual review process. The review process includes checks on timeliness, consistency, accuracy, completeness and comparability.

Figure 1 Dataflow for the compilation of the EU LRTAP Convention Emission Inventory

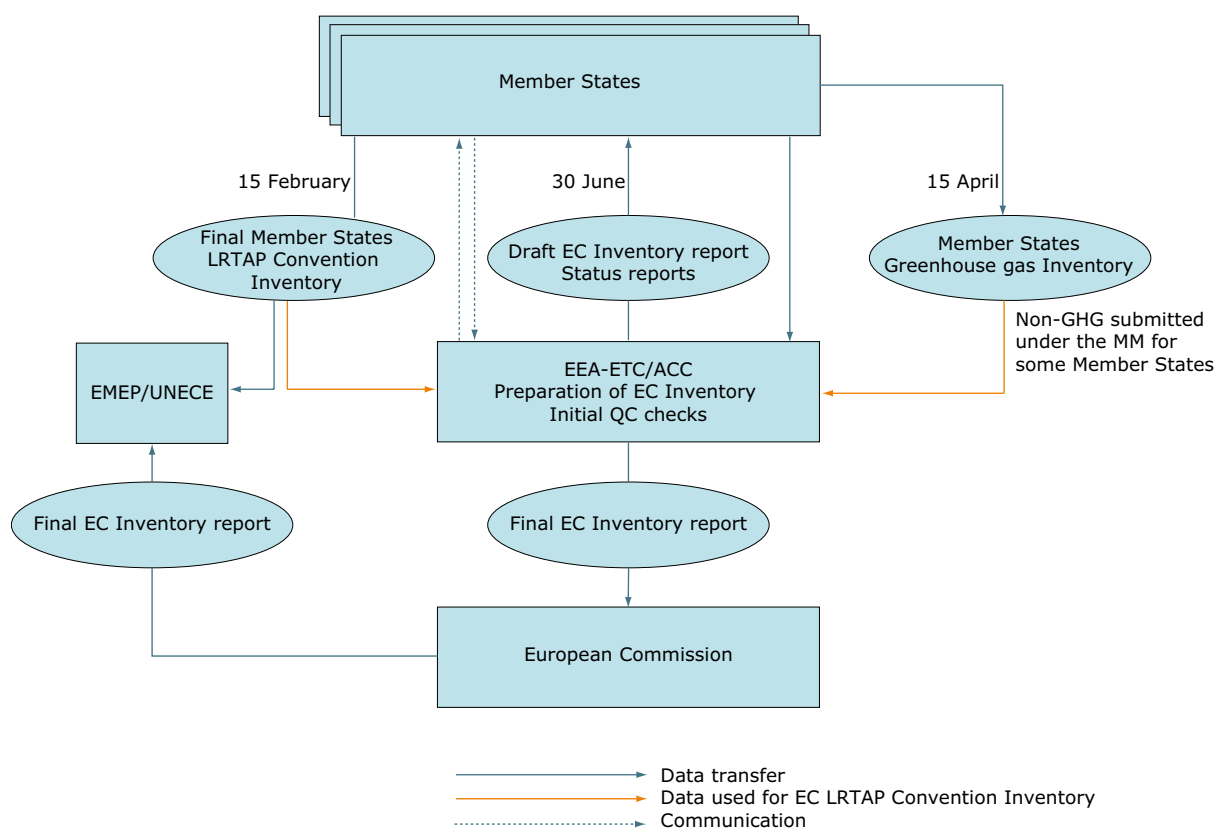
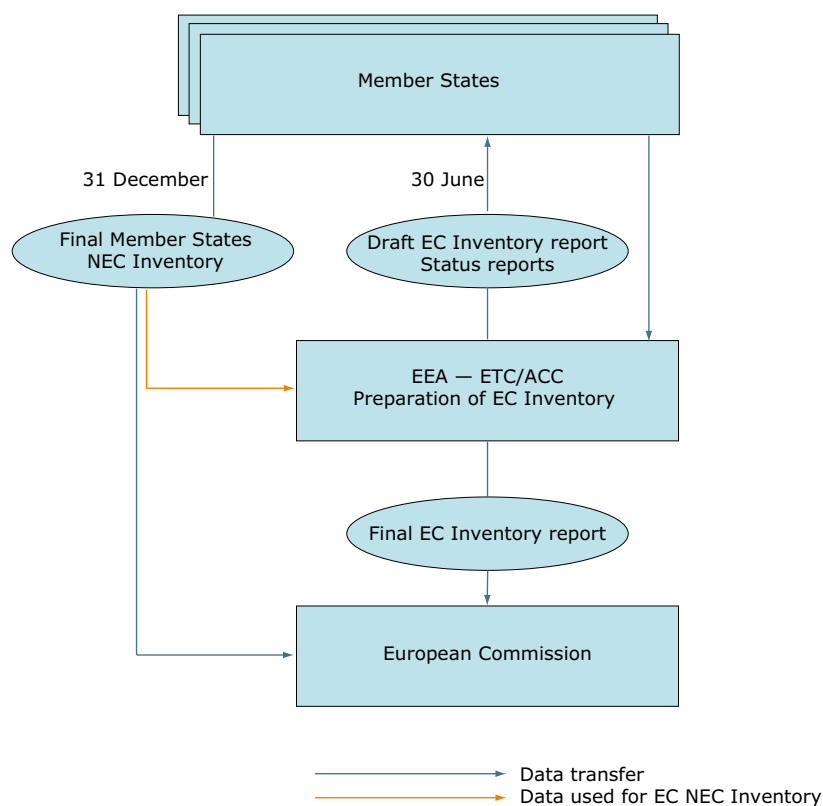


Figure 2 Dataflow for the compilation of the EU NEC Emission Inventory**Table 2** Overview of air emission reporting obligations in the European Community

Convention	Legal obligation	Reporting requirements	Reporting deadline for EU Member States	Reporting deadline for the EU
LRTAP Convention	1979 Convention on Long-range Transboundary Air Pollution	Emission of SO _x (as SO ₂), NO _x (as NO ₂), NH ₃ , NMVOCs, CO, heavy metals (HMs), persistent organic pollutants (POPs), and particulate matter (PM)	15 February	15 February
	Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants	Emission of SO ₂ , NO _x , NMVOCs, NH ₃	31 December	
UNFCCC	Council Decision 280/2004/EC concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.	Emission of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NO _x , CO, NMVOC, SO ₂	15 January (to the European Commission) 15 April (to the UNFCCC)	15 April

Table 3 Date of receipt by the European Commission (EC) and the EEA, years covered and NFR Tables available from Member States by 23 June 2006 under LRTAP Convention

Member State	Submission date			Latest data available	Years covered	Gases covered	Format emissions
	Uploaded to CDR	Not in CDR but e-mailed to the EC	Not in CDR but e-mailed to EEA-ETC/ACC				
Austria	14 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, priority metals, POPs	NFR02 (level 2)
Belgium			20 June 2006	2004	1990, 1995, 2000–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Denmark	16 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Finland			15 Feb 2006	2004	2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
France	15 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Germany	22 June 2006			2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Greece		15 Feb 2006		2004	2004	NO _x , CO, NMVOC, SO _x	NFR02 (level 2)
Ireland	1 Mar 2006			2004	1990, 1995–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Italy	8 May 2006 (CIRCA)			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Luxembourg							
Netherlands	22 Dec 2005			2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	NFR02 (level 2)
	15 Feb 2006			2004	1990, 1995, 2000, 2002–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Portugal			24 Mar 2006	2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM	NFR02 (level 2)
Spain	21 June 2006			2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Sweden	14 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
United Kingdom	15 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Cyprus	16 June 2006			2004	2003–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Czech Republic	15 Feb 2006			2004	2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Estonia	15 Feb 2006			2004	2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)

Member State	Submission date			Latest data available	Years covered	Gases covered	Format emissions
	Uploaded to CDR	Not in CDR but e-mailed to the EC	Not in CDR but e-mailed to EEA-ETC/ACC				
Hungary	28 Dec 2005			2003	2003	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
	13 Feb 2006			2004	2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Latvia	15 Feb 2006			2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
	15 May 2006			2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	NFR02 (level 2)
Lithuania							
Malta				2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	NFR02 (level 2)
Poland		16 Feb 2006		2004	2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, priority metals, POPs	NFR02 (level 2)
		12 Apr 2006		2004	2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, priority metals, POPs	NFR02 (level 2)
Slovenia	15 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, priority metals, POPs	1980–1999: NFR01 (level 1); 2000–2004: NFR02 (level 2)
	15 Apr 2006			2004	2000–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, priority metals, POPs	NFR02 (level 2)
	25 May 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, priority metals, POPs	1980–1999: NFR01 (level 1); 2000–2004: NFR02 (level 2)
Slovakia	13 Feb 2006			2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	1990–1999: Totals; 2000–2004: NFR02 (level 2)

Note: The table shows only the first submission date of each Member State to the European Commission or EEA.

Table 4 New informative inventory reports available from Member States by 23 June 2006

Member State	NIR	Inventory
Austria	Small report	1980–2004
Belgium	Yes	1990, 1995, 2000–2004
Finland	Yes	2004
France	Yes	1980–2004
Sweden	Yes	1980–2004
Cyprus	Yes	2003–2004
Latvia	Yes	1990–2004
Poland	Yes	2004
Slovakia	Small report	1990–2004

1.5 General assessment of the completeness

Due to data gaps and a lack of an agreed data gap filling procedure, total European Community emissions can only be estimated for NO_x, CO, NMVOCs, SO_x and NH₃. Data reported for particulate matter (PM), persistent organic pollutants (POPs) and heavy metals (HM) are presented in Annex F.

1.5.1 Data gaps and gap filling

For Member States which did not provide their LRTAP Convention Inventory submission to the EEA, the emissions of air pollutants reported to the European Commission and the EEA under NEC and/or under the GHG Monitoring Mechanism were used. The three reporting obligations differ mainly in the number and type of air pollutants, the geographical coverage of countries (e.g. France, Spain, Portugal, the United Kingdom), and the inclusion of domestic and international aviation and navigation in the national total. The major differences are summarised in Table 5.

Table 6 shows the Member States in which the new NFR (nomenclature for reporting) and the CRF (common reporting format) data were used in order to estimate SO_x, NO_x, CO and NMVOC emissions at EC level (see also Annex A for more details for EU-15 Member States). In cases where Member States did not submit emission data under LRTAP Convention, air emission data reported under NEC and/or under the GHG monitoring mechanism (Council Decision 280/2004/EC) were used.

Adaptations for the calculation of the NFR Tables IV 1A for the EU-15

Although the new NFR and the CRF are now widely compatible, an additional table was included for EU-15 in order to use the new NFR data together with the CRF data (for those Member States which did not provide data in the new NFR). The adaptation was necessary because the new NFR does not allow for reporting of sub-category totals for civil aviation and international aviation. As the CRF includes only sub-category totals, an additional table is provided including sub-category totals for civil aviation and international aviation. This additional table is provided for each year in a separate sheet to NFR Table IV 1A.

1.5.2 Data basis of the European Community LRTAP Inventory

Annex A provides a detailed overview of data availability for NO_x, CO, NMVOCs, SO_x, NH₃, particulate matter (PM), heavy metals (HMs) and persistent organic pollutants (POPs) for each EU-15 Member State.

Annex B provides the status reports for the EC Member States.

Annex C provides the Tables IV 1A for the years 1990–2004 for the EU-15. Because of lack of data and lack of a data gap filling procedure, emissions can be provided for only a limited number of gases.

Table 5 Major differences between the reporting obligations under LRTAP Convention, NEC and the Council Decision 280/2004/EC

	NFR (LRTAP Convention)	NFR (NEC)	CRF
Air pollutants	NO _x , SO _x , CO, NMVOC, NH ₃ , HMs, POPs, PM	NO _x , SO _x , NMVOC, NH ₃	NO _x , SO _x , NMVOC, CO
Domestic aviation (LTO)	Included in national total	Included in national total	Included in national total
Domestic aviation (Cruise)	Included in national total	Not included in national total	Included in national total
International aviation (LTO)	Not included in national total	Included in national total	Not included in national total
International aviation (Cruise)	Not included in national total	Not included in national total	Not included in national total
International inland shipping	Not included in national total	Included in national total	Not included in national total
International maritime	Not included in national total	Not included in national total	Not included in national total
Road transport	Emissions calculated based on fuel sold or consumed		Emissions calculated based on fuel sold

Table 6 Data basis for SO_x, NO_x, CO and NMVOC from the new NFR and from the CRF

Member States	New NFR as provided as LRTAP Convention submission under Eionet	New NFR as provided under NEC	CRF as provided under Council Decision 280/2004/EC and used in EEA (2006)
Austria	1990–2004		
Belgium	1990, 1995, 2000–2004		1991–1994, 1996–1999
Cyprus	2003–2004	2000–2002 (NO _x , NMVOC, SO ₂ , NH ₃)	1990–1999, 2000–2002 (CO)
Czech Republic	2002–2004		
Denmark	1990–2004		
Estonia	2001–2004		
Finland	2001–2002, 2004	2003	1990–2000
France	1990–2004		
Germany	1990–2004		
Greece	1990–2004		
Hungary	1990–2004		
Ireland	2001–2004		1990–2000
Italy	1990–2004		
Latvia	1990–2004		
Lithuania	2002	2003–2004 (NO _x , NMVOC, SO ₂ , NH ₃)	1990, 1998, 2001, 2003–2004 (CO)
Luxembourg			1990–2004
Malta	2003–2004 (NO _x , NMVOC, SO ₂ , NH ₃)		1990–2000
Netherlands	1990, 1995, 1998–2004		1991–1994, 1996–1997
Poland	2001 (NMVOC), 2003–2004		2001–2002 (NO _x , CO, SO ₂); 2002 (NMVOC)
Portugal	1990–2004		
Slovakia	2000–2004		
Slovenia	2000–2004		
Spain	1990–2004		
Sweden	1990–2004		
United Kingdom	1990–2004		

2 European Community air pollution trends

Total emissions of air pollutants for the EU-25 cannot fully be estimated due to a lack of data. EU-25 totals are only available for NO_x, CO, NMVOC and SO_x for the years 1990 and 1998, 2003 and 2004. CO is not available for 2003 and 2004. Furthermore, EU-25 totals for NH₃ are not available (see Tables 8–12).

For EU-15 Figure 3 and Table 7 show the trends of NO_x, CO, NMVOCs, SO_x between 1990 and 2004.

NH₃ is shown for 1990 and 1995–2002. All gases were reduced. The largest reductions in absolute terms were in CO emissions (25 320 Gg), followed by SO_x (11,540 Gg), NMVOC (6 339 Gg) and NO_x (4 215 Gg). NH₃ emissions decreased by 306 Gg between 1990 and 2002. In relative terms, the largest reductions were in SO_x emissions (70 %) between 1990 and 2004 (Table 7).

Figure 3 EU-15 emission trends for NO_x, CO, NMVOCs, SO_x between 1990 and 2003 and for NH₃ in 1990 and 1995–2002

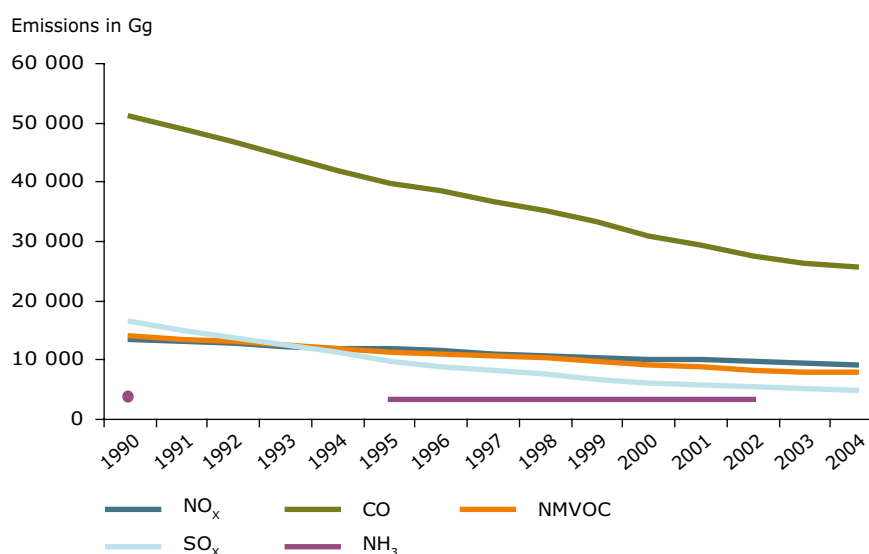


Table 7 Total EU-15 emissions of NO_x, CO, NMVOCs, SO_x and NH₃ in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
NO _x	13 504	13 198	12 975	12 389	12 041	11 801	11 516	11 067	10 866	10 550	10 231	10 009	9 673	9 537	9 289
CO	51 129	48 842	46 743	44 440	41 839	39 948	38 631	36 858	35 299	33 245	30 777	29 504	27 518	26 371	25 809
NMVOC	14 185	13 491	13 145	12 480	11 917	11 478	10 994	10 662	10 317	9 771	9 177	8 780	8 331	7 990	7 847
SO _x	16 491	14 882	13 705	12 450	11 239	9 935	8 868	8 135	7 599	6 750	6 018	5 812	5 599	5 145	4 951
NH ₃	3 649	NE	NE	NE	NE	3 417	3 380	3 453	3 464	3 457	3 405	3 394	3 342	NE	NE

Note: Notation key NE stands for 'not estimated'.

2.1 LRTAP Convention emission trends

Tables 8–12 show the contribution of the EC Member States to the EU-15 and EU-25 total emissions for NO_x, CO, NMVOCs, SO_x and NH₃ in Gg.

Between 1990 and 2004 NO_x emissions in the EU-15 total decreased by 31 %. Six Member States (Austria, Greece, Ireland, Portugal and Spain) reported increases in this period, with the highest in Spain (318 Gg). France, Germany, Italy, Spain and the United Kingdom reported the highest NO_x emissions in 2004, all above 1000 Gg. The change of NO_x emissions in the EU-15 total between 2003 and 2004 was slight — a decrease of 2.6 % (248 Gg),

mainly caused by reductions achieved in Germany, Italy and the United Kingdom (Table 8).

All new Member States reported NO_x emissions for 2004. Between 1990 and 2004 the NO_x emissions in the EU-10 total decreased by 39 % (1 043 Gg). Poland, followed by the Czech Republic reported the highest emissions. Between 2003 and 2004 the change in NO_x in the EU-10 emissions was minor (– 0.5 %) (Table 8).

Between 1990 and 2004 NO_x emissions decreased in the EU-25 by 33 % (5 229 Gg) and between 2003 and 2004 by 2.3 % (256 Gg). EU-25 NO_x emissions in 2004 account for 10 918 Gg (Table 8).

Table 8 Member States contribution to European Community emissions of NO_x Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	212	223	210	203	195	193	212	200	212	199	204	213	220	230	227
Belgium	382	364	360	351	356	372	333	326	325	298	330	316	300	297	298
Denmark	273	323	280	279	277	262	300	254	232	215	198	194	190	198	181
Finland	298	273	266	267	267	245	250	243	228	222	209	222	208	219	203
France	1 830	1 889	1 854	1 740	1 695	1 644	1 618	1 552	1 533	1 462	1 392	1 336	1 283	1 244	1 219
Germany	2 878	2 648	2 492	2 383	2 236	2 131	2 050	1 976	1 940	1 916	1 855	1 763	1 674	1 605	1 554
Greece	300	312	315	314	321	321	326	332	350	337	330	344	341	343	317
Ireland	116	71	129	117	114	114	118	116	120	117	123	135	125	120	119
Italy	1 943	2 001	2 020	1 921	1 841	1 808	1 732	1 654	1 554	1 453	1 373	1 352	1 258	1 245	1 173
Luxembourg	23	23	24	24	23	20	21	20	19	16	18	17	17	17	15
Netherlands	552	461	447	429	412	466	457	417	428	429	389	382	368	367	360
Portugal	243	257	277	266	265	274	268	267	278	287	285	286	294	271	271
Spain	1 217	1 255	1 290	1 268	1 301	1 326	1 294	1 340	1 355	1 431	1 453	1 440	1 496	1 493	1 535
Sweden	306	295	293	281	283	271	261	250	242	230	217	211	206	203	197
United Kingdom	2 933	2 803	2 719	2 546	2 456	2 355	2 278	2 121	2 052	1 937	1 857	1 799	1 693	1 685	1 621
EU-15	13 504	13 198	12 975	12 389	12 041	11 801	11 516	11 067	10 866	10 550	10 231	10 009	9 673	9 537	9 289
Cyprus	19	20	25	24	24	24	25	25	26	22	22	21	22	22	18
Czech Republic	544	521	496	454	375	368	366	349	321	313	321	332	318	323	328
Estonia	68	63	39	38	41	42	44	45	46	40	47	38	40	39	37
Hungary	238	203	183	184	187	190	196	200	203	201	185	185	186	186	185
Latvia	70	57	47	47	42	42	44	42	40	38	36	39	38	39	40
Lithuania	158	NE	NE	NE	NE	NE	NE	NE	60	NE	NE	55	51	53	48
Malta	10	10	11	11	11	10	9	9	10	10	10	NE	NE	12	12
Poland	1 280	1 205	1 130	1 120	1 105	1 120	1 154	1 114	991	951	838	805	796	808	804
Slovakia	222	201	189	180	170	178	135	128	133	121	109	109	101	98	98
Slovenia	63	58	58	63	66	67	70	71	64	58	59	59	58	55	58
EU-10	2 672	NE	NE	NE	NE	NE	NE	NE	1 893	NE	NE	NE	NE	1 636	1 628
EU-25	16 176	NE	NE	NE	NE	NE	NE	NE	12 759	NE	NE	NE	NE	11 173	10 918

Note: Notation key NE stands for 'not estimated'.

Between 1990 and 2004 CO emissions in the EU-15 decreased by 50 % (25 320 Gg). All Member States reported decreases; the largest absolute decreases were reported by Germany, France, the United Kingdom and Italy. In 2004 they were also the largest emitters of CO emissions (Table 9).

In the EU-10 all Member States, except Malta and Lithuania, reported emissions for the entire time series. Therefore, the following EU-10 values do not include Malta's and Lithuania's CO emissions. In 2004, CO emissions in the EU-10 accounted for

5 734 Gg. Between 1990 and 2004, CO emissions decreased by 51 %, mainly due to reductions in Poland. Between 2003 and 2004 emissions increased by 15 %, because of a rise in emissions reported by Poland (Table 9).

In the EU-25 (excluding Malta) emissions in 2004 accounted for 31 027 Gg, and between 1990 and 2004 CO emissions decreased by 51 %. Between 2003 and 2004, CO emissions in the EU-25 (excluding Malta) decreased by 1.0 % (Table 9).

Table 9 Member States contribution to European Community emissions of CO in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	1 222	1 242	1 198	1 155	1 102	1 010	1 021	954	915	863	798	782	738	762	742
Belgium	1 379	1 316	1 297	1 196	1 109	1 114	1 050	978	944	936	1 072	1 009	985	953	969
Denmark	765	797	789	784	736	728	723	665	630	593	587	604	588	604	619
Finland	710	677	668	653	641	637	627	630	623	617	597	605	600	564	551
France	10 766	10 655	10 186	9 654	8 962	8 831	8 282	7 843	7 704	7 231	6 669	6 351	6 048	5 853	6 008
Germany	12 120	9 914	8 575	7 774	6 846	6 404	6 083	6 033	5 643	5 286	4 991	4 696	4 434	4 311	4 095
Greece	1 302	1 312	1 341	1 344	1 340	1 334	1 360	1 361	1 391	1 316	1 364	1 275	1 244	1 201	1 155
Ireland	397	387	391	347	326	301	303	308	313	281	275	273	254	239	239
Italy	7 183	7 477	7 677	7 623	7 402	7 166	6 867	6 607	6 197	5 897	5 164	5 086	4 468	4 381	4 207
Luxembourg	177	185	186	198	169	121	113	86	58	49	56	53	48	48	41
Netherlands	1 145	1 026	982	925	896	872	851	772	739	702	740	659	658	638	612
Portugal	880	893	931	901	869	852	832	799	787	763	749	700	689	675	668
Spain	3 659	3 712	3 753	3 561	3 538	3 219	3 352	3 185	3 181	2 903	2 692	2 601	2 478	2 406	2 384
Sweden	1 133	1 110	1 090	1 053	1 036	1 010	967	903	836	787	730	691	659	627	588
United Kingdom	8 292	8 139	7 679	7 272	6 867	6 350	6 200	5 734	5 338	5 021	4 293	4 119	3 625	3 110	2 930
EU-15	51 129	48 842	46 743	44 440	41 839	39 948	38 631	36 858	35 299	33 245	30 777	29 504	27 518	26 371	25 809
Cyprus	71	69	77	76	74	74	71	67	65	93	92	91	88	85	45
Czech Republic	1 257	1 179	1 170	1 103	1 125	999	1 012	944	765	716	648	649	546	578	572
Estonia	434	399	208	210	241	242	268	283	281	215	203	177	178	183	175
Hungary	997	913	836	796	774	761	727	733	737	722	633	576	563	565	587
Latvia	465	326	593	306	386	379	385	352	343	332	320	329	322	326	356
Lithuania	519	NE	NE	NE	NE	NE	NE	NE	358	NE	NE	229	224	223	182
Malta	24	25	27	28	29	30	31	31	31	31	30	NE	NE	NE	NE
Poland	7 406	NE	7 083	8 655	5 115	4 547	4 837	4 700	4 301	4 363	3 463	3 528	3 410	2 626	3 426
Slovakia	512	487	445	456	431	420	364	364	346	335	313	315	292	308	310
Slovenia	81	78	78	87	93	91	95	93	77	70	100	90	85	81	82
EU-10	11 766	NE	NE	NE	NE	NE	NE	NE	7 304	NE	NE	NE	NE	NE	NE
EU-25	62 895	NE	NE	NE	NE	NE	NE	NE	42 603	NE	NE	NE	NE	NE	NE

Note: Notation key NE stands for 'not estimated'.

In EU-15, NMVOC emissions in 2004 accounted for 7 847 Gg. Between 1990 and 2004, emissions decreased by 45 % (6 339 Gg). Almost all countries reported reductions; the largest emitters were France, Germany, Italy, Spain and the United Kingdom. Between 2003 and 2004 NMVOC emissions decreased by 1.8 % (144 Gg) (Table 10).

In EU-10, NMVOC emissions in 2004 accounted for 1 543 Gg. Between 1990 and 2004 emissions

decreased by 22 % (430 Gg). Poland was the largest emitter and reported a rise in emissions between 1990 and 2004. Between 2003 and 2004, NMVOC emissions in the EU-10 decreased by 2.1 % (Table 10).

In the EU-25 NMVOC emissions decreased by 42 % between 1990 and 2004 and accounted 2004 for 9 390 Gg. Between 2003 and 2004, emissions decreased by 1.8% (176 Gg) (Table 10).

Table 10 Member States contribution to European Community emissions of NMVOCs in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	284	272	243	238	221	221	216	203	190	179	179	182	176	175	172
Belgium	354	312	309	297	286	306	257	248	241	232	249	243	230	224	213
Denmark	166	167	165	161	156	152	152	145	135	130	127	122	118	116	116
Finland	222	212	205	195	191	185	178	174	169	164	158	157	151	145	141
France	2 414	2 392	2 344	2 240	2 119	2 032	1 944	1 870	1 812	1 733	1 658	1 587	1 476	1 411	1 367
Germany	3 584	3 043	2 775	2 520	2 247	2 100	1 974	1 913	1 842	1 714	1 569	1 476	1 381	1 272	1 268
Greece	280	288	296	302	308	305	309	308	312	307	299	294	289	288	332
Ireland	103	103	107	98	99	97	103	106	108	87	76	87	81	78	63
Italy	1 986	2 048	2 129	2 097	2 033	2 004	1 952	1 884	1 779	1 688	1 506	1 432	1 335	1 299	1 263
Luxembourg	18	18	19	19	18	17	16	15	14	12	12	11	11	11	10
Netherlands	491	412	389	361	340	364	293	264	301	291	267	242	236	222	216
Portugal	273	277	287	280	287	288	290	293	293	285	282	284	286	287	287
Spain	1 170	1 204	1 211	1 139	1 161	1 107	1 127	1 143	1 199	1 193	1 165	1 139	1 122	1 124	1 119
Sweden	443	428	417	395	373	362	349	330	303	293	282	270	264	265	255
United Kingdom	2 396	2 315	2 249	2 140	2 077	1 939	1 832	1 766	1 617	1 463	1 348	1 252	1 175	1 073	1 024
EU-15	14 185	13 491	13 145	12 480	11 917	11 478	10 994	10 662	10 317	9 771	9 177	8 780	8 331	7 990	7 847
Cyprus	14	14	15	15	15	16	15	15	15	16	16	16	16	16	12
Czech Republic	441	394	366	346	310	292	293	277	242	234	227	220	203	203	203
Estonia	88	82	45	42	45	48	50	54	54	42	34	33	38	40	40
Hungary	205	150	142	149	142	150	150	145	141	170	173	158	158	155	157
Latvia	99	64	74	57	64	62	64	64	63	63	57	57	58	59	63
Lithuania	108	NE	NE	NE	NE	NE	NE	NE	79	NE	NE	71	72	74	41
Malta	5	5	5	5	6	6	11	8	9	10	7	NE	NE	8	6
Poland	831	833	805	756	819	769	766	774	730	731	599	873	898	892	888
Slovakia	138	NE	NE	113	NE	107	105	95	92	85	80	83	78	82	85
Slovenia	44	41	40	42	44	44	49	48	42	40	50	48	47	47	46
EU-10	1 973	NE	NE	NE	NE	NE	NE	NE	1 467	NE	NE	NE	NE	1 576	1 543
EU-25	16 159	NE	NE	NE	NE	NE	NE	NE	11 784	NE	NE	NE	NE	9 566	9 390

Note: Notation key NE stands for 'not estimated'.

In EU-15, the SO_x emissions in 2004 accounted for 4 951 Gg. Between 1990 and 2004 emissions decreased by 70 % (11 540 Gg), mainly due to reductions in Germany (89 %) and the United Kingdom (77 %). Between 2003 and 2004, SO_x emissions decreased 3.8 % (Table 11).

In EU-10, the SO_x emissions in 2004 accounted for 2 059 Gg. Between 1990 and 2004 emissions

decreased by 72 %, mainly due to decreases in the Czech Republic (88 %), Hungary (75 %) and Poland (61.3 %). Between 2003 and 2004 SO_x emissions decreased by 12 % (Table 11).

In 2004, the EU-25 total amounted to 7,010 Gg. Between 1990 and 2004, SO_x emissions decreased by 71 % (16 911 Gg), and between 2003 and 2004, SO_x emissions decreased by 6.5 % (486 Gg) (Table 11).

Table 11 Member States contribution to European Community emissions of SO_x in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	74	71	55	53	48	47	45	40	36	34	32	33	33	33	29
Belgium	361	361	353	327	284	262	242	221	208	169	171	169	158	154	161
Denmark	178	237	182	148	146	136	171	99	76	55	28	26	25	32	24
Finland	273	200	152	133	121	101	105	102	94	88	80	85	82	99	85
France	1 333	1 438	1 256	1 099	1 033	968	944	796	817	705	613	550	510	505	484
Germany	5 289	3 920	3 222	2 859	2 401	1 708	1 426	1 197	956	776	630	628	588	595	559
Greece	487	525	544	542	513	536	523	518	527	544	493	502	513	545	529
Ireland	183	180	170	161	175	161	147	166	176	157	131	126	96	76	71
Italy	1 795	1 677	1 578	1 478	1 388	1 320	1 210	1 134	997	900	755	705	625	528	496
Luxembourg	15	15	14	15	13	8	8	6	4	4	3	3	2	2	3
Netherlands	189	141	133	126	119	127	121	102	108	103	73	73	66	63	66
Portugal	317	308	370	316	296	332	270	292	341	341	306	294	294	200	203
Spain	2 180	2 173	2 136	2 013	1 964	1 809	1 579	1 756	1 603	1 619	1 479	1 457	1 562	1 287	1 360
Sweden	117	114	109	96	93	79	77	70	67	54	52	51	51	52	47
United Kingdom	3 699	3 522	3 430	3 085	2 649	2 343	1 999	1 635	1 591	1 202	1 173	1 111	994	973	833
EU-15	16 491	14 882	13 705	12 450	11 239	9 935	8 868	8 135	7 599	6 750	6 018	5 812	5 599	5 145	4 951
Cyprus	45	36	41	45	44	43	45	47	48	50	53	50	51	46	45
Czech Republic	1 881	1 780	1 543	1 424	1 275	1 089	944	697	438	268	264	251	237	231	227
Estonia	252	246	187	154	149	119	125	119	110	103	99	92	88	101	89
Hungary	1 010	913	827	757	741	705	673	659	592	590	486	400	365	347	248
Latvia	100	82	68	66	66	47	54	39	35	29	10	8	6	5	4
Lithuania	222	NE	NE	NE	NE	NE	NE	NE	94	NE	NE	49	43	43	37
Malta	19	19	21	19	24	30	31	32	34	30	26	NE	NE	33	17
Poland	3 210	3 156	2 820	2 725	2 605	2 376	2 368	2 181	1 897	1 719	1 511	1 564	1 455	1 375	1 241
Slovakia	526	445	390	328	245	246	231	205	184	173	127	131	103	106	97
Slovenia	196	180	186	183	177	125	112	118	123	104	99	68	71	66	54
EU-10	7 460	NE	NE	NE	NE	NE	NE	NE	3 555	NE	NE	NE	NE	2 351	2 059
EU-25	23 951	NE	NE	NE	NE	NE	NE	NE	11 154	NE	NE	NE	NE	7 496	7 010

Note: Notation key NE stands for 'not estimated'.

NH₃ emissions for 2004 were not reported by Greece or Luxembourg. The EU-15 total of NH₃ emissions decreased by 12 % between 1990 and 2004 — excluding Greece and Luxembourg. The countries emitting most in 2004 were France (742 Gg) and Germany (639 Gg). Between 2003 and 2004, emissions were almost stable (Table 12).

The EU-10 total of NH₃ emissions amounted to 567 Gg in 2004. Some countries (Cyprus, Lithuania,

Poland and Malta) did not report the entire time series. The overall trend between 1990 and 2004 is however decreasing. Between 2003 and 2004, NH₃ emissions decreased by 2.6 % (15 Gg) (Table 12).

The EU-25 total of NH₃ emissions amounts in 2004 for 3 785 Gg — without Greece and Luxembourg (Table 12).

Table 12 Member States contribution to European Community emissions of NH₃ in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	69	70	68	68	69	70	69	69	69	67	66	65	64	65	64
Belgium	112	93	93	97	96	103	99	99	102	100	87	84	82	79	74
Denmark	134	130	128	125	121	114	110	110	111	106	105	104	102	98	98
Finland	38	NE	41	NE	NE	35	35	38	38	35	33	33	33	33	33
France	787	772	777	757	766	772	775	789	788	780	789	775	778	750	742
Germany	758	670	653	654	633	642	645	636	644	650	646	659	649	648	639
Greece	79	78	75	75	73	85	73	71	74	73	74	74	73	NE	NE
Ireland	112	115	117	117	119	120	122	123	127	127	122	123	119	116	114
Italy	465	469	456	462	452	447	438	449	449	455	444	451	437	433	426
Luxembourg	8	NE	NE	8	7	7	7	7	7	7	7	7	5	NE	NE
Netherlands	249	228	180	191	166	193	146	189	170	166	152	143	136	130	134
Portugal	55	60	61	60	63	63	63	66	65	65	64	66	64	64	64
Spain	347	340	336	320	346	344	375	380	399	408	421	423	423	434	436
Sweden	55	55	55	62	62	64	61	62	61	59	58	57	57	56	56
United Kingdom	382	382	368	365	368	359	362	364	361	358	337	330	319	308	336
EU-15	3 649	NE	NE	NE	NE	3 417	3 380	3 453	3 464	3 457	3 405	3 394	3 342	NE	NE
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	6	7	7	6	6
Czech Republic	156	134	115	99	91	86	81	81	80	75	74	77	72	82	70
Estonia	24	22	18	13	13	11	10	10	10	8	9	9	9	8	10
Hungary	124	93	84	77	76	77	78	76	74	71	71	66	65	67	74
Latvia	47	44	32	20	17	15	14	14	13	12	12	14	13	14	13
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	51	34
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1	1
Poland	512	443	447	382	384	380	364	350	371	341	322	NE	NE	323	317
Slovakia	65	58	48	42	39	40	39	37	33	31	30	31	31	29	26
Slovenia	24	23	24	23	22	22	22	19	20	20	20	20	20	19	17
EU-10	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	582	567
EU-25	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Note: Notation key NE stands for 'not estimated'.

2.2 Key source categories

This chapter provides an overview of the most important sources of NO_x , SO_x , NMVOC and CO and the Member States' contributions to the key sources in terms of level and trend. Table 13 shows an overview of key source categories for emissions reported under LRTAP Convention. The ten source categories with the highest contribution to the EU-15 total in 2004 are taken as key sources.

Table 13 shows that the category 'Road transportation (1A3b)' is the most important key

source for NO_x , CO and NMVOC. 'Public electricity and heating (1A1a)' was responsible for significant NO_x and SO_x emissions, and 'Manufacturing industries and construction (1A2)' contributed significantly to NO_x , CO and SO_x emissions. More than 85 % of the total emissions can be explained by listing ten key sources.

Tables 14–53 provide an overview of EU-15 States' contribution to the most important key sources (according to Table 13) for, NO_x , CO, NMVOC and SO_x , respectively.

Table 13 Least aggregated key source analysis for the EU-15

Pollutant	Key source categories (sorted from high to low from left to right)										Total in %
NO_x	1A3b	1A1a	1A2	1A4c	1A4b	1A3dii	1A4a	4D1	1A1b	1A1c	95.10 %
	41.55 %	15.97 %	15.11 %	7.60 %	4.51 %	3.54 %	2.02 %	1.83 %	1.70 %	1.28 %	
CO	1A3b	1A4b	1A2	2C	6C	1A4c	1A3dii	1A1a	1A4a	2B	99.13 %
	45.30 %	21.56 %	13.27 %	9.27 %	2.88 %	2.18 %	2.00 %	1.51 %	0.70 %	0.48 %	
NMVOC	1A3b	3D	3A	1A4b	1B2	3C	2D	2A	2B	1A3dii	86.47 %
	21.73 %	16.78 %	16.13 %	8.03 %	7.83 %	4.36 %	3.56 %	3.05 %	2.60 %	2.43 %	
SO_x	1A1a	1A2	1A1b	1A4b	1B2	1A3dii	1A4a	2B	1A3b	1A1c	95.72 %
	52.55 %	17.13 %	9.25 %	4.06 %	3.53 %	3.33 %	1.80 %	1.57 %	1.36 %	1.14 %	

2.2.1 Key source categories for NO_x

Table 14 shows that France, Germany, Italy, Spain and the United Kingdom were responsible for 77 % of the NO_x emissions in the category 1A3b 'Road transportation'. Between 1990 and 2004, emissions decreased by 39 %, due to reductions made in countries with high levels of emissions.

Table 15 shows that Germany, Spain and the United Kingdom were responsible for 60 % of the NO_x emissions in the category 1A1a 'Public electricity and heat production'. Between 1990 and 2004, almost all countries reduced their emissions; important reductions were achieved by Germany, Italy and the United Kingdom.

Table 14 NO_x sector overview for key source 1A3b 'Road transportation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	98.88	130.88	129.56	3 %	- 1.32	- 1 %	30.68	31 %
Belgium	183.65	136.13	133.53	3 %	- 2.60	- 2 %	- 50.12	- 27 %
Denmark	102.09	62.57	59.08	2 %	- 3.49	- 6 %	- 43.01	- 42 %
Finland	134.31	66.17	61.49	2 %	- 4.68	- 7 %	- 72.82	- 54 %
France	1 092.54	603.92	580.71	15 %	- 23.22	- 4 %	- 511.83	- 47 %
Germany	1343.22	776.57	732.25	19 %	- 44.32	- 6 %	- 610.97	- 45 %
Greece	109.17	116.29	109.10	3 %	- 7.19	- 6 %	- 0.07	0 %
Ireland	41.32	44.60	43.84	1 %	- 0.76	- 2 %	2.52	6 %
Italy	889.30	599.49	540.74	14 %	- 58.75	- 10 %	- 348.56	- 39 %
Luxembourg	8.13	7.20	6.04	0 %	- 1.16	- 16 %	- 2.09	- 26 %
Netherlands	261.41	158.79	152.46	4 %	- 6.33	- 4 %	- 108.95	- 42 %
Portugal	79.83	104.79	101.94	3 %	- 2.85	- 3 %	22.10	28 %
Spain	513.09	549.47	538.55	14 %	- 10.92	- 2 %	25.46	5 %
Sweden	165.52	80.83	75.15	2 %	- 5.68	- 7 %	- 90.37	- 55 %
United Kingdom	1 323.80	633.50	595.17	15 %	- 38.33	- 6 %	- 728.63	- 55 %
EU-15	6 346.27	4 071.21	3 859.61	100 %	- 211.59	- 5 %	- 2 486.66	- 39 %

Table 15 NO_x sector overview for key source 1A1a 'Public electricity and heat production'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003– 2004		Change 1990– 2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	12.15	10.97	11.37	1 %	0.40	4 %	- 0.79	- 6 %
Belgium	60.61	34.48	35.36	2 %	0.88	3 %	- 25.24	- 42 %
Denmark	90.75	55.65	44.21	3 %	- 11.44	- 21 %	- 46.54	- 51 %
Finland	57.36	58.03	49.36	3 %	- 8.66	- 15 %	- 8.00	- 14 %
France	115.58	108.49	104.57	7 %	- 3.92	- 4 %	- 11.01	- 10 %
Germany	462.09	218.07	223.07	15 %	5.00	2 %	- 239.02	- 52 %
Greece	53.96	79.53	84.80	6 %	5.27	7 %	30.84	57 %
Ireland	46.37	33.82	32.34	2 %	- 1.48	- 4 %	- 14.03	- 30 %
Italy	408.63	122.88	111.11	7 %	- 11.77	- 10 %	- 297.52	- 73 %
Luxembourg	0.30	0.47	0.68	0 %	0.21	45 %	0.38	127 %
Netherlands	78.12	49.88	51.40	3 %	1.52	3 %	- 26.72	- 34 %
Portugal	65.22	50.16	49.72	3 %	- 0.45	- 1 %	- 15.50	- 24 %
Spain	228.32	301.26	323.61	22 %	22.35	7 %	95.29	42 %
Sweden	14.44	13.25	12.20	1 %	- 1.06	- 8 %	- 2.25	- 16 %
United Kingdom	776.19	368.46	349.63	24 %	- 18.83	- 5 %	- 426.57	- 55 %
EU-15	2 470.09	1 505.40	1 483.42	100 %	- 21.98	- 1 %	- 986.67	- 40 %

Table 16 shows that the United Kingdom, Spain and Italy were responsible for 56 % of the NO_x emissions in the category 1A2 'Manufacturing industries and construction'. Between 1990 and 2004, EU-15-emissions decreased by 21 % mainly due to reductions in Germany, Italy and the United Kingdom. Spain showed a rise in emissions of 84 %.

Table 17 shows that Germany, Spain, France and Italy are responsible for 62 % of the NO_x emissions in the category 1A4c 'Agriculture/forestry/fishing'. Between 1990 and 2004, the EU-15 total emissions decreased by 11 %, although some countries reported increasing emissions from this category.

Table 16 NO_x sector overview for key source 1A2 'Manufacturing industries and construction'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	44.19	35.60	34.01	2 %	- 1.59	- 4 %	- 10.18	- 23 %
Belgium	46.14	48.13	50.20	4 %	2.06	4 %	4.06	9 %
Denmark	17.30	15.41	15.00	1 %	- 0.41	- 3 %	- 2.30	- 13 %
Finland	50.88	38.43	43.14	3 %	4.72	12 %	- 7.74	- 15 %
France	184.87	140.96	144.84	10 %	3.87	3 %	- 40.04	- 22 %
Germany	347.32	148.58	143.59	10 %	- 4.99	- 3 %	- 203.73	- 59 %
Greece	40.47	41.01	22.65	2 %	- 18.36	- 45 %	- 17.82	- 44 %
Ireland	9.81	15.35	16.84	1 %	1.49	10 %	7.02	72 %
Italy	289.30	172.60	175.34	12 %	2.74	2 %	- 113.96	- 39 %
Luxembourg	11.68	6.53	5.37	0 %	- 1.16	- 18 %	- 6.31	- 54 %
Netherlands	88.69	48.89	48.28	3 %	- 0.61	- 1 %	- 40.41	- 46 %
Portugal	37.60	50.13	51.34	4 %	1.21	2 %	13.74	37 %
Spain	188.60	320.83	346.29	25 %	25.46	8 %	157.69	84 %
Sweden	48.94	42.60	43.67	3 %	1.07	3 %	- 5.27	- 11 %
United Kingdom	369.27	267.44	263.05	19 %	- 4.40	- 2 %	- 106.23	- 29 %
EU-15	1 775.06	1 392.50	1 403.60	100 %	11.10	1 %	- 371.46	- 21 %

Table 17 NO_x sector overview for key source 1A4c 'Agriculture/forestry/fishing'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	19.70	19.46	19.54	3 %	0.08	0 %	- 0.16	- 1 %
Belgium	16.07	14.87	14.82	2 %	- 0.05	0 %	- 1.25	- 8 %
Denmark	27.73	23.99	21.80	3 %	- 2.19	- 9 %	- 5.93	- 21 %
Finland	18.22	16.22	15.32	2 %	- 0.90	- 6 %	- 2.90	- 16 %
France	158.17	128.91	122.83	17 %	- 6.09	- 5 %	- 35.35	- 22 %
Germany	87.06	76.06	75.63	11 %	- 0.43	- 1 %	- 11.43	- 13 %
Greece	40.53	45.78	38.83	6 %	- 6.95	- 15 %	- 1.70	- 4 %
Ireland	5.75	11.88	11.40	2 %	- 0.48	- 4 %	5.65	98 %
Italy	111.66	100.45	86.77	12 %	- 13.68	- 14 %	- 24.89	- 22 %
Luxembourg	0.51	0.51	0.51	0 %	0.00	0 %	0.00	0 %
Netherlands	44.11	46.21	44.79	6 %	- 1.42	- 3 %	0.68	2 %
Portugal	31.30	17.18	17.19	2 %	0.01	0 %	- 14.11	- 45 %
Spain	136.14	151.52	154.02	22 %	2.50	2 %	17.88	13 %
Sweden	21.63	23.30	24.18	3 %	0.88	4 %	2.55	12 %
United Kingdom	76.44	63.46	58.27	8 %	- 5.19	- 8 %	- 18.17	- 24 %
EU-15	795.02	739.81	705.91	100 %	- 33.91	- 5 %	- 89.12	- 11 %

Table 18 shows that Germany, the United Kingdom, France and Italy are responsible for 74 % of the NO_x emissions in the category 1A4b 'Residential'. Between 1990 and 2004, the EU-15 total emissions increased by 3 %, only four countries (Sweden, the Netherlands, Germany and Finland) reported reductions for this period.

Table 19 shows that Italy, the United Kingdom and Spain were responsible for 59 % of the NO_x emissions in the category 1A3dii 'National navigation'. Between 1990 and 2004, the EU-15 total emissions increased by 4 %, although seven countries reported reductions for this period.

Table 18 NO_x sector overview for key source 1A4b 'Residential'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	14.09	14.56	14.17	3 %	- 0.39	- 3 %	0.07	1 %
Belgium	16.19	18.49	18.29	4 %	- 0.19	- 1 %	2.10	13 %
Denmark	5.06	5.28	5.20	1 %	- 0.08	- 1 %	0.14	3 %
Finland	6.95	7.48	5.42	1 %	- 2.06	- 28 %	- 1.52	- 22 %
France	58.92	66.19	67.56	16 %	1.37	2 %	8.63	15 %
Germany	91.87	83.46	78.43	19 %	- 5.03	- 6 %	- 13.44	- 15 %
Greece	6.96	10.16	7.68	2 %	- 2.48	- 24 %	0.72	10 %
Ireland	5.46	5.22	5.45	1 %	0.23	4 %	0.00	0 %
Italy	45.33	48.35	48.13	11 %	- 0.22	0 %	2.81	6 %
Luxembourg	0.48	0.53	0.52	0 %	- 0.01	- 2 %	0.04	8 %
Netherlands	20.18	19.88	19.61	5 %	- 0.26	- 1 %	- 0.57	- 3 %
Portugal	5.42	5.73	5.90	1 %	0.17	3 %	0.49	9 %
Spain	16.39	19.60	20.14	5 %	0.54	3 %	3.75	23 %
Sweden	11.14	7.10	6.70	2 %	- 0.40	- 6 %	- 4.44	- 40 %
United Kingdom	103.67	114.22	115.69	28 %	1.47	1 %	12.02	12 %
EU-15	408.11	426.25	418.90	100 %	- 7.35	- 2 %	10.79	3 %

Table 19 NO_x sector overview for key source 1A3dii 'National navigation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	0.52	0.75	0.76	0 %	0.01	1 %	0.24	46 %
Belgium	5.25	5.89	6.01	2 %	0.12	2 %	0.76	14 %
Denmark	9.33	8.66	7.99	2 %	- 0.67	- 8 %	- 1.34	- 14 %
Finland	9.13	8.70	8.15	2 %	- 0.55	- 6 %	- 0.98	- 11 %
France	21.84	29.09	30.67	9 %	1.57	5 %	8.83	40 %
Germany	38.70	14.52	16.38	5 %	1.86	13 %	- 22.32	- 58 %
Greece	32.66	34.60	38.93	12 %	4.33	13 %	6.27	19 %
Ireland	1.11	0.79	0.73	0 %	- 0.06	- 7 %	- 0.38	- 34 %
Italy	70.28	79.24	79.21	24 %	- 0.02	0 %	8.93	13 %
Luxembourg	0.08	0.08	0.08	0 %	0.00	0 %	0.00	0 %
Netherlands	7.76	11.43	11.43	3 %	0.00	0 %	3.67	47 %
Portugal	5.52	4.74	4.85	1 %	0.11	2 %	- 0.67	- 12 %
Spain	33.70	51.70	52.68	16 %	0.98	2 %	18.98	56 %
Sweden	7.88	8.22	7.37	2 %	- 0.85	- 10 %	- 0.51	- 7 %
United Kingdom	71.82	64.73	63.27	19 %	- 1.46	- 2 %	- 8.55	- 12 %
EU-15	315.59	323.13	328.51	100 %	5.38	2 %	12.92	4 %

Table 20 shows that France, Germany and Italy were responsible for 56 % of the NO_x emissions in the 1A4a 'Commercial/institutional' category. Between 1990 and 2004, the EU-15 total emissions increased by 10 %. The United Kingdom and Germany reported important reductions, while Italy and Portugal reported important increases.

Table 21 shows that Germany and France were responsible for 87 % of the NO_x emissions in the category 4D1 'Direct soil emission'. Between 1990 and 2004, the EU-15 total emissions increased by 13 %.

Table 20 NO_x sector overview for key source 1A4a 'Commercial/institutional'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	3.21	3.17	2.87	2 %	- 0.30	- 10 %	- 0.34	- 11 %
Belgium	3.50	5.62	5.47	3 %	- 0.15	- 3 %	1.97	56 %
Denmark	1.40	1.30	1.09	1 %	- 0.22	- 17 %	- 0.31	- 22 %
Finland	2.52	1.86	1.74	1 %	- 0.12	- 6 %	- 0.78	- 31 %
France	35.83	37.70	39.10	21 %	1.40	4 %	3.28	9 %
Germany	47.49	28.80	27.40	15 %	- 1.40	- 5 %	- 20.09	- 42 %
Greece	0.43	0.87	0.94	1 %	0.07	8 %	0.51	119 %
Ireland	2.09	2.62	2.51	1 %	- 0.11	- 4 %	0.43	20 %
Italy	15.90	36.42	38.58	21 %	2.16	6 %	22.68	143 %
Luxembourg	0.48	0.53	0.52	0 %	- 0.01	- 2 %	0.04	8 %
Netherlands	12.19	15.97	15.68	8 %	- 0.29	- 2 %	3.48	29 %
Portugal	4.51	21.41	23.45	12 %	2.04	10 %	18.94	420 %
Spain	2.73	8.19	8.51	5 %	0.32	4 %	5.78	212 %
Sweden	3.31	0.88	0.68	0 %	- 0.20	- 23 %	- 2.63	- 80 %
United Kingdom	34.31	29.46	19.17	10 %	- 10.29	- 35 %	- 15.14	- 44 %
EU-15	169.91	194.81	187.72	100 %	- 7.09	- 4 %	17.81	10 %

Table 21 NO_x sector overview for key source 4D1 'Direct soil emission'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	6.05	5.39	5.23	3 %	- 0.17	- 3 %	0.82	14 %
Belgium	NO	NA	NA	NA	NA	NA	NA	NA
Denmark	NA	NA	NA	NA	NA	0 %	NA	0 %
Finland	NE	NA	NA	NA	NA	NA	NA	NA
France	75.32	66.00	66.51	39 %	0.51	1 %	8.81	12 %
Germany	97.98	81.38	81.64	48 %	0.26	0 %	16.35	17 %
Greece	0.00	0.00	0.00	0 %	0.00	0 %	0.00	0 %
Ireland	NE	NO	NO	NA	NA	NA	NA	NA
Italy	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Luxembourg	NE	NE	NE	NA	NA	0 %	NA	0 %
Netherlands	NO	NO	NO	NA	NA	NA	NA	NA
Portugal	0.00	0.00	0.00	0 %	0.00	0 %	0.00	0 %
Spain	15.03	17.52	16.43	10 %	- 1.09	- 6 %	- 1.40	- 9 %
Sweden	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA
EU-15	194.37	170.29	169.80	100 %	- 0.49	0 %	24.57	13 %

Note: Notation key NE stands for 'not estimated', NA for 'not applicable' and NO for 'not occurring'.

Table 22 shows that the United Kingdom, Spain, Italy and Germany were responsible for 64 % of the NO_x emissions in the category 1A1b 'Petroleum refining'. Between 1990 and 2004, the EU-15 total emissions decreased by 21 %.

Table 23 shows that Italy and the United Kingdom were responsible for 76 % of the NO_x emissions in the category 1A1c 'Manufacture of solid fuels and other energy industries'. Between 1990 and 2004, the EU-15 total emissions decreased by 32 %. Denmark, Greece and reported an increase in emissions of more than 100 %.

Table 22 NO_x sector overview for key source 1A1b 'Petroleum refining'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	4.32	3.34	3.44	2 %	0.09	3 %	- 0.88	- 20 %
Belgium	7.32	0.00	6.66	4 %	6.66	NA	- 0.66	- 9 %
Denmark	1.62	1.65	1.61	1 %	- 0.04	- 2 %	- 0.01	0 %
Finland	4.05	2.74	2.30	1 %	- 0.45	- 16 %	- 1.75	- 43 %
France	16.20	17.74	17.14	11 %	- 0.60	- 3 %	0.93	6 %
Germany	33.80	22.23	22.37	14 %	0.14	1 %	- 11.42	- 34 %
Greece	4.79	6.54	5.19	3 %	- 1.35	- 21 %	0.40	8 %
Ireland	0.30	0.59	0.82	1 %	0.23	40 %	0.53	178 %
Italy	37.26	25.71	24.42	15 %	- 1.29	- 5 %	- 12.84	- 34 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	18.74	9.76	9.28	6 %	- 0.48	- 5 %	- 9.46	- 50 %
Portugal	4.86	6.74	6.34	4 %	- 0.41	- 6 %	1.48	30 %
Spain	23.61	24.84	25.00	16 %	0.16	1 %	1.39	6 %
Sweden	3.45	3.80	3.87	2 %	0.07	2 %	0.43	12 %
United Kingdom	39.60	26.63	29.35	19 %	2.72	10 %	- 10.25	- 26 %
EU-15	199.91	158.85	157.78	100 %	- 1.07	- 1 %	- 42.13	- 21 %

Note: Notation key NA stands for 'not applicable'.

Table 23 NO_x sector overview for key source 1A1c 'Manufacture of solid fuels and other energy industries'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	0.83	0.58	0.45	0 %	- 0.14	- 23 %	- 0.38	- 46 %
Belgium	0.83	1.11	1.11	1 %	0.00	0 %	0.28	34 %
Denmark	2.38	6.61	6.84	6 %	0.23	3 %	4.47	188 %
Finland	0.29	0.01	0.07	0 %	0.06	426 %	- 0.22	- 75 %
France	8.71	5.57	5.33	4 %	- 0.24	- 4 %	- 3.38	- 39 %
Germany	105.20	19.20	20.80	18 %	1.59	8 %	- 84.40	- 80 %
Greece	0.11	0.10	0.22	0 %	0.12	131 %	0.11	104 %
Ireland	0.03	NO	0.10	0 %	NA	NA	0.07	200 %
Italy	8.59	9.68	9.79	8 %	0.11	1 %	1.20	14 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	2.96	2.96	2.97	3 %	0.02	1 %	0.02	1 %
Portugal	0.18	0.00	0.00	0 %	0.00	NA	- 0.18	- 100 %
Spain	5.55	5.34	5.15	4 %	- 0.19	- 4 %	- 0.41	- 7 %
Sweden	0.43	0.13	0.15	0 %	0.02	12 %	- 0.28	- 66 %
United Kingdom	36.75	61.89	65.73	55 %	3.84	6 %	28.98	79 %
EU-15	175.52	113.20	118.71	100 %	5.51	5 %	- 56.81	- 32 %

Note: Notation key NA stands for 'not applicable'.

2.2.2 Key source categories for CO

Table 24 shows that Italy, France and Germany were responsible for 53 % of the CO emissions in the category 1A3b 'Road transportation'. Between 1990 and 2004, the EU-15 total emissions decreased by 64 %, all countries reported reductions during this period.

Table 25 shows that France and Germany were responsible for 47 % of the CO emissions in the category 1A4b 'Residential'. Between 1990 and 2004, the EU-15 total emissions decreased by 27 %, all countries except Denmark, Greece and Italy reported reductions during this period.

Table 24 CO sector overview for key source 1A3b 'Road transportation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	420.53	182.29	168.89	1 %	- 13.39	- 7 %	- 251.64	- 60 %
Belgium	671.43	340.74	326.18	3 %	- 14.56	- 4 %	- 345.25	- 51 %
Denmark	448.83	259.57	232.65	2 %	- 26.92	- 10 %	- 216.18	- 48 %
Finland	469.62	286.71	266.92	2 %	- 19.79	- 7 %	- 202.70	- 43 %
France	6 260.15	2 031.40	1 919.16	17 %	- 112.25	- 6 %	- 4 340.99	- 69 %
Germany	6 526.71	1 859.17	1 700.36	15 %	- 158.81	- 9 %	- 4 826.36	- 74 %
Greece	906.14	830.71	789.00	7 %	- 41.71	- 5 %	- 117.14	- 13 %
Ireland	299.09	177.35	171.01	1 %	- 6.35	- 4 %	- 128.09	- 43 %
Italy	5 500.69	2 787.02	2 478.03	22 %	- 308.99	- 11 %	- 3 022.66	- 55 %
Luxembourg	44.52	33.02	27.81	0 %	- 5.21	- 16 %	- 16.71	- 38 %
Netherlands	737.11	355.69	331.13	3 %	- 24.55	- 7 %	- 405.98	- 55 %
Portugal	501.25	308.35	290.55	3 %	- 17.80	- 6 %	- 210.70	- 42 %
Spain	2 337.54	1 189.84	1 118.69	10 %	- 71.15	- 6 %	- 1 218.85	- 52 %
Sweden	821.61	303.03	267.75	2 %	- 35.28	- 12 %	- 553.86	- 67 %
United Kingdom	5 479.87	1 596.61	1367.55	12 %	- 229.07	- 14 %	- 4 112.32	- 75 %
EU-15	31 425.11	12 541.50	11 455.68	100 %	- 1 085.83	- 9 %	- 19 969.43	- 64 %

Table 25 CO sector overview for key source 1A4b 'Residential'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	441.36	312.02	298.46	5 %	- 13.56	- 4 %	- 142.90	- 32 %
Belgium	84.44	70.81	70.10	1 %	- 0.71	- 1 %	- 14.34	- 17 %
Denmark	189.14	273.17	284.88	5 %	11.71	4 %	95.75	51 %
Finland	77.23	115.22	114.65	2 %	- 0.57	0 %	37.42	48 %
France	1 978.30	1 763.59	1 734.73	32 %	- 28.85	- 2 %	- 243.57	- 12 %
Germany	1 933.62	871.18	820.46	15 %	- 50.73	- 6 %	- 1 113.16	- 58 %
Greece	176.53	176.86	176.96	3 %	0.10	0 %	0.43	0 %
Ireland	87.64	35.07	38.31	1 %	3.24	9 %	- 49.33	- 56 %
Italy	258.36	373.68	444.69	8 %	71.01	19 %	186.33	72 %
Luxembourg	5.78	2.95	2.94	0 %	- 0.01	0 %	- 2.84	- 49 %
Netherlands	68.12	54.22	54.14	1 %	- 0.08	0 %	- 13.98	- 21 %
Portugal	278.83	251.21	252.80	5 %	1.59	1 %	- 26.04	- 9 %
Spain	516.52	476.88	477.24	9 %	0.36	0 %	- 39.28	- 8 %
Sweden	194.76	178.74	172.01	3 %	- 6.73	- 4 %	- 22.75	- 12 %
United Kingdom	1 196.59	491.49	509.29	9 %	17.80	4 %	- 687.31	- 57 %
EU-15	7 487.25	5 447.09	5 451.66	100 %	4.57	0 %	- 2 035.59	- 27 %

Table 26 shows that France, Germany and the United Kingdom were responsible for 60 % of the CO emissions in the category 1A2 'Manufacturing industries and construction'. Between 1990 and 2004, the EU-15 total emissions decreased by 12 %, most countries reduced their emissions while Belgium reported a major increase.

Table 27 shows that France and Germany were responsible for 66 % of the CO emissions in the category 2C 'Metal production'. Between 1990 and 2004, the EU-15 total emissions decreased by 18 %, mainly due to decreasing emissions reported by Belgium, France, Germany and Italy.

Table 26 CO sector overview for key source 1A2 'Manufacturing industries and construction'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	236.60	167.54	173.40	5 %	5.86	3 %	- 63.20	- 27 %
Belgium	270.86	380.37	409.67	12 %	29.30	8 %	138.81	51 %
Denmark	13.00	10.32	10.07	0 %	- 0.25	- 2 %	- 2.92	- 22 %
Finland	42.25	48.49	64.00	2 %	15.51	32 %	21.75	51 %
France	855.07	747.23	755.49	23 %	8.26	1 %	- 99.57	- 12 %
Germany	793.92	637.01	618.93	18 %	- 18.08	- 3 %	- 174.99	- 22 %
Greece	16.09	18.72	9.36	0 %	- 9.36	- 50 %	- 6.73	- 42 %
Ireland	1.54	11.18	14.46	0 %	3.28	29 %	12.91	837 %
Italy	317.78	306.63	298.08	9 %	- 8.55	- 3 %	- 19.70	- 6 %
Luxembourg	103.09	2.22	2.66	0 %	0.44	20 %	- 100.43	- 97 %
Netherlands	152.37	107.24	103.65	3 %	- 3.59	- 3 %	- 48.72	- 32 %
Portugal	32.95	25.70	27.03	1 %	1.34	5 %	- 5.92	- 18 %
Spain	170.15	172.50	191.84	6 %	19.34	11 %	21.69	13 %
Sweden	31.84	33.63	34.00	1 %	0.37	1 %	2.15	7 %
United Kingdom	779.64	620.12	642.49	19 %	22.36	4 %	- 137.15	- 18 %
EU-15	3 817.14	3 288.90	3 355.13	100 %	66.23	2 %	- 462.01	- 12 %

Table 27 CO sector overview for key source 2C 'Metal production'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	23.52	2.30	2.52	0 %	0.21	9 %	- 21.00	- 89 %
Belgium	269.06	85.99	90.88	4 %	4.89	6 %	- 178.19	- 66 %
Denmark	NE	NE	NE	NA	NA	NA	NA	NA
Finland	IE, NO	0.67	0.75	0 %	0.08	12 %	NA	NA
France	1 111.89	737.24	975.37	42 %	238.13	32 %	- 136.52	- 12 %
Germany	680.57	582.97	583.00	25 %	0.03	0 %	- 97.57	- 14 %
Greece	0.00	0.00	22.50	1 %	22.50	NA	22.50	NA
Ireland	NO	NO	NO	NA	NA	NA	NA	NA
Italy	190.43	96.90	102.01	4 %	5.11	5 %	- 88.42	- 46 %
Luxembourg	17.40	6.78	4.42	0 %	- 2.36	- 35 %	- 12.98	- 75 %
Netherlands	118.79	39.99	45.34	2 %	5.35	13 %	- 73.45	- 62 %
Portugal	8.88	10.82	15.82	1 %	5.00	46 %	6.94	78 %
Spain	289.63	371.36	398.93	17 %	27.58	7 %	109.30	38 %
Sweden	2.30	2.40	2.47	0 %	0.06	3 %	0.17	7 %
United Kingdom	136.80	97.63	99.65	4 %	2.02	2 %	- 37.16	- 27 %
EU-15	2 849.28	2 035.05	2 343.65	100 %	308.60	15 %	- 505.63	- 18 %

Note: Notation key NE stands for 'not estimated', NA for 'not applicable', IE for 'included elsewhere' and NO for 'not occurring'.

Table 28 shows that France and Italy were responsible for 86 % of the CO emissions in the category 6C 'Waste incineration'. Between 1990 and 2004, the EU-15 total emissions increased by 48 %, mainly due to increasing emissions reported by France and Italy.

Table 29 shows that Germany, France and Italy were responsible for 49 % of the CO emissions in the category 1A4c 'Agriculture/forestry/fishing'. Between 1990 and 2004, the EU-15 total emissions decreased by 43 %, mainly due to decreasing emissions reported by Italy and Germany.

Table 28 CO sector overview for key source 6C 'Waste incineration'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	0.05	0.01	0.01	0 %	0.00	0 %	- 0.04	- 84 %
Belgium	0.90	0.24	0.26	0 %	0.02	9 %	- 0.64	- 71 %
Denmark	NO	NO	NO	NA	NA	NA	NA	NA
Finland	IE	0.02	0.25	0 %	0.23	996 %	NA	NA
France	227.78	237.61	288.83	40 %	51.22	22 %	61.05	27 %
Germany	NO	NO	NO	NA	NA	NA	NA	NA
Greece	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Ireland	NE	NE	NE	NA	NA	NA	NA	NA
Italy	159.18	267.67	337.37	46 %	69.70	26 %	178.20	112 %
Luxembourg	0.01	0.01	0.01	0 %	0.00	0 %	0.00	0 %
Netherlands	NO	NO	NO	NA	NA	NA	NA	NA
Portugal	0.02	0.04	0.03	0 %	0.00	- 5 %	0.02	91 %
Spain	81.54	78.43	78.41	11 %	- 0.01	0 %	- 3.13	- 4 %
Sweden	NE	0.02	0.02	0 %	0.00	- 20 %	NA	NA
United Kingdom	22.53	22.53	22.53	3 %	0.00	0 %	0.00	0 %
EU-15	492.01	606.58	727.74	100 %	121.15	20 %	235.72	48 %

Note: Notation key IE stands for 'included elsewhere', NA for 'not applicable' and NO for 'not occurring'.

Table 29 CO sector overview for key source 1A4c 'Agriculture/forestry/fishing'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	40.88	43.26	44.41	8 %	1.15	3 %	3.53	9 %
Belgium	6.30	5.89	5.89	1 %	- 0.01	0 %	- 0.41	- 7 %
Denmark	82.11	28.33	26.01	5 %	- 2.33	- 8 %	- 56.10	- 68 %
Finland	34.89	26.24	26.26	5 %	0.02	0 %	- 8.63	- 25 %
France	113.04	88.04	87.61	16 %	- 0.42	0 %	- 25.43	- 22 %
Germany	197.66	62.23	64.15	12 %	1.92	3 %	- 133.51	- 68 %
Greece	87.56	66.82	63.30	11 %	- 3.52	- 5 %	- 24.26	- 28 %
Ireland	1.85	4.00	3.67	1 %	- 0.33	- 8 %	1.82	98 %
Italy	278.47	109.23	115.75	21 %	6.52	6 %	- 162.72	- 58 %
Luxembourg	1.05	1.08	1.08	0 %	0.00	0 %	0.03	3 %
Netherlands	14.91	16.04	15.27	3 %	- 0.76	- 5 %	0.36	2 %
Portugal	8.73	5.17	5.10	1 %	- 0.07	- 1 %	- 3.64	- 42 %
Spain	43.64	41.38	42.32	8 %	0.95	2 %	- 1.32	- 3 %
Sweden	11.51	13.52	13.81	3 %	0.30	2 %	2.30	20 %
United Kingdom	38.87	37.09	36.82	7 %	- 0.27	- 1 %	- 2.05	- 5 %
EU-15	961.47	548.30	551.45	100 %	3.15	1 %	- 410.02	- 43 %

Table 30 shows that Italy and France were responsible for 81 % of the CO emissions in the category 1A3dii 'National navigation'. Between 1990 and 2004, the EU-15 total emissions increased by 27 %, mainly due to increasing emissions reported by Italy and France.

Table 31 shows that Germany, Greece and the United Kingdom were responsible for 61 % of the CO emissions in the category 1A1a 'Public electricity and heat production'. Between 1990 and 2004, the EU-15 total emissions decreased by 1 %.

Table 30 CO sector overview for key source 1A3dii 'National navigation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	3.03	2.85	2.88	1 %	0.03	1 %	- 0.15	- 5 %
Belgium	1.36	1.29	1.30	0 %	0.01	1 %	- 0.07	- 5 %
Denmark	7.56	7.82	7.77	2 %	- 0.05	- 1 %	0.21	3 %
Finland	19.04	25.99	25.33	5 %	- 0.66	- 3 %	6.28	33 %
France	78.96	136.57	141.25	28 %	4.68	3 %	62.29	79 %
Germany	7.95	2.53	2.82	1 %	0.29	12 %	- 5.14	- 65 %
Greece	4.24	4.49	5.05	1 %	0.56	12 %	0.81	19 %
Ireland	0.28	0.20	0.19	0 %	- 0.01	- 7 %	- 0.10	- 34 %
Italy	230.07	275.21	265.85	53 %	- 9.36	- 3 %	35.77	16 %
Luxembourg	0.03	0.03	0.03	0 %	0.00	0 %	0.00	0 %
Netherlands	11.76	18.89	18.89	4 %	0.00	0 %	7.13	61 %
Portugal	0.57	0.49	0.50	0 %	0.01	2 %	- 0.07	- 12 %
Spain	0.95	1.49	1.51	0 %	0.03	2 %	0.56	59 %
Sweden	22.89	23.80	23.79	5 %	- 0.01	0 %	0.90	4 %
United Kingdom	9.32	8.40	8.21	2 %	- 0.19	- 2 %	- 1.11	- 12 %
EU-15	398.02	510.02	505.35	100 %	- 4.67	- 1 %	107.33	27 %

Table 31 CO sector overview for key source 1A1a 'Public electricity and heat production'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	1.36	3.24	3.27	1 %	0.04	1 %	1.92	141 %
Belgium	2.45	3.38	4.47	1 %	1.09	32 %	2.02	83 %
Denmark	7.95	12.20	11.71	3 %	- 0.50	- 4 %	3.76	47 %
Finland	4.37	19.36	13.69	4 %	- 5.67	- 29 %	9.32	213 %
France	11.88	15.62	16.50	4 %	0.88	6 %	4.62	39 %
Germany	155.75	106.98	116.51	30 %	9.53	9 %	- 39.24	- 25 %
Greece	35.99	46.53	48.17	13 %	1.64	4 %	12.18	34 %
Ireland	3.18	4.08	3.52	1 %	- 0.56	- 14 %	0.33	10 %
Italy	21.62	29.82	30.41	8 %	0.59	2 %	8.80	41 %
Luxembourg	0.05	0.05	0.07	0 %	0.02	40 %	0.02	40 %
Netherlands	6.28	15.56	15.64	4 %	0.09	1 %	9.36	149 %
Portugal	2.10	3.17	4.12	1 %	0.96	30 %	2.02	96 %
Spain	10.79	19.10	17.96	5 %	- 1.14	- 6 %	7.17	66 %
Sweden	8.20	28.30	29.05	8 %	0.75	3 %	20.85	254 %
United Kingdom	112.90	67.53	67.65	18 %	0.12	0 %	- 45.25	- 40 %
EU-15	384.87	374.92	382.75	100 %	7.83	2 %	- 2.12	- 1 %

Table 32 shows that Germany was responsible for 51 % of the CO emissions in the category 1A4a 'Commercial/institutional'. Between 1990 and 2004, the EU-15 total emissions decreased by 88 %, mainly due to reductions reported by Germany.

Table 33 shows that Portugal and the United Kingdom were responsible for 65 % of the CO emissions in the category 2B 'Chemical industry'. Between 1990 and 2004, the EU-15 total emissions decreased by 28 %, all reporting countries reported reductions except Portugal.

Table 32 CO sector overview for key source 1A4a 'Commercial/institutional'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	11.43	13.87	13.36	8 %	- 0.50	- 4 %	1.94	17 %
Belgium	1.60	2.20	2.25	1 %	0.05	2 %	0.65	40 %
Denmark	0.89	0.92	0.91	1 %	- 0.02	- 2 %	0.01	2 %
Finland	4.64	5.99	5.98	3 %	- 0.01	0 %	1.34	29 %
France	15.94	15.09	15.34	9 %	0.25	2 %	- 0.60	- 4 %
Germany	1 338.63	91.59	90.64	51 %	- 0.95	- 1 %	- 1 247.99	- 93 %
Greece	1.04	0.62	0.66	0 %	0.04	6 %	- 0.38	- 36 %
Ireland	2.51	2.93	2.50	1 %	- 0.43	- 15 %	- 0.01	0 %
Italy	14.84	17.17	17.99	10 %	0.81	5 %	3.15	21 %
Luxembourg	4.66	1.83	1.82	1 %	- 0.01	- 1 %	- 2.84	- 61 %
Netherlands	2.42	3.16	3.10	2 %	- 0.07	- 2 %	0.68	28 %
Portugal	0.26	1.08	1.16	1 %	0.08	7 %	0.90	350 %
Spain	7.33	11.43	11.58	7 %	0.16	1 %	4.25	58 %
Sweden	4.00	2.56	4.50	3 %	1.94	76 %	0.50	12 %
United Kingdom	14.84	6.33	5.41	3 %	- 0.92	- 15 %	- 9.43	- 64 %
EU-15	1 425.03	176.76	177.19	100 %	0.42	0 %	- 1 247.85	- 88 %

Table 33 CO sector overview for key source 2B 'Chemical industry'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	12.67	11.09	11.11	9 %	0.02	0 %	- 1.56	- 12 %
Belgium	9.66	0.84	0.90	1 %	0.06	7 %	- 8.76	- 91 %
Denmark	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Finland	NO	0.00	NA	NA	NA	NA	NA	NA
France	11.43	5.80	5.82	5 %	0.02	0 %	- 5.61	- 49 %
Germany	1.93	0.91	0.87	1 %	- 0.04	- 4 %	- 1.06	- 55 %
Greece	0.00	0.00	1.26	1 %	1.26	NA	1.26	NA
Ireland	NA, NO	NO	NO	NA	NA	NA	NA	NA
Italy	15.33	14.47	13.62	11 %	- 0.85	- 6 %	- 1.71	- 11 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	1.42	0.00	0.00	0 %	0.00	NA	- 1.42	- 100 %
Portugal	24.61	48.13	50.15	41 %	2.02	4 %	25.54	104 %
Spain	8.46	7.54	7.90	7 %	0.36	5 %	- 0.56	- 7 %
Sweden	NE	0.25	0.31	0 %	0.05	22 %	NA	NA
United Kingdom	81.89	37.08	28.94	24 %	- 8.14	- 22 %	- 52.95	- 65 %
EU-15	167.40	126.10	120.87	100 %	- 5.23	- 4 %	- 46.54	- 28 %

Note: Notation key NE stands for 'not estimated', NA for 'not applicable' and NO for 'not occurring'.

2.2.3 Key source categories for NMVOC

Table 34 shows that Italy, France and Spain made the highest contribution to NMVOC emissions in the category 1A3b 'Road transportation'. Between 1990 and 2004, all countries except Greece reported reductions in their NMVOC emissions. EU-15 emissions decreased by 70 %.

Table 35 shows that France, Germany and Italy were responsible for 50 % of the NMVOC emissions in the category 3D 'Other'. Between 1990 and 2004, the EU-15 total emissions decreased by 18 %, all reporting countries reported reductions except Portugal, Spain and Luxembourg.

Table 34 NMVOC sector overview for key source 1A3b 'Road transportation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	69.01	22.42	20.70	1 %	- 1.72	- 8 %	- 48.31	- 70 %
Belgium	103.68	46.57	44.59	3 %	- 1.98	- 4 %	- 59.09	- 57 %
Denmark	79.52	29.87	26.48	2 %	- 3.39	- 11 %	- 53.04	- 67 %
Finland	63.94	40.88	37.08	2 %	- 3.80	- 9 %	- 26.86	- 42 %
France	1 051.39	333.39	299.22	18 %	- 34.16	- 10 %	- 752.17	- 72 %
Germany	1 408.99	186.66	168.56	10 %	- 18.10	- 10 %	- 1 240.43	- 88 %
Greece	158.52	170.56	160.34	9 %	- 10.22	- 6 %	1.82	1 %
Ireland	62.02	24.85	21.56	1 %	- 3.30	- 13 %	- 40.47	- 65 %
Italy	962.53	453.62	414.42	24 %	- 39.20	- 9 %	- 548.12	- 57 %
Luxembourg	9.10	4.59	3.60	0 %	- 0.99	- 22 %	- 5.50	- 60 %
Netherlands	188.55	82.39	76.25	4 %	- 6.14	- 7 %	- 112.30	- 60 %
Portugal	83.26	49.01	46.84	3 %	- 2.17	- 4 %	- 36.42	- 44 %
Spain	418.98	230.10	207.28	12 %	- 22.82	- 10 %	- 211.71	- 51 %
Sweden	115.98	38.62	33.68	2 %	- 4.94	- 13 %	- 82.29	- 71 %
United Kingdom	866.87	174.73	144.11	8 %	- 30.62	- 18 %	- 722.76	- 83 %
EU-15	5 642.34	1 888.25	1 704.70	100 %	- 183.55	- 10 %	- 3 937.65	- 70 %

Table 35 NMVOC sector overview for key source 3D 'Other'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	37.99	37.44	37.26	3 %	- 0.18	0 %	- 0.73	- 2 %
Belgium	38.77	33.67	33.27	3 %	- 0.40	- 1 %	- 5.50	- 14 %
Denmark	20.50	18.64	20.30	2 %	1.66	9 %	- 0.20	- 1 %
Finland	18.55	10.28	10.17	1 %	- 0.11	- 1 %	- 8.38	- 45 %
France	215.07	192.82	188.58	14 %	- 4.25	- 2 %	- 26.49	- 12 %
Germany	436.00	303.53	293.11	22 %	- 10.43	- 3 %	- 142.89	- 33 %
Greece	56.84	52.73	38.92	3 %	- 13.81	- 26 %	- 17.92	- 32 %
Ireland	13.25	16.64	11.51	1 %	- 5.13	- 31 %	- 1.74	- 13 %
Italy	185.23	178.07	180.16	14 %	2.09	1 %	- 5.07	- 3 %
Luxembourg	1.28	1.32	1.32	0 %	0.00	0 %	0.04	3 %
Netherlands	41.65	30.90	30.96	2 %	0.06	0 %	- 10.69	- 26 %
Portugal	26.53	28.47	28.60	2 %	0.13	0 %	2.08	8 %
Spain	114.63	164.68	171.98	13 %	7.30	4 %	57.36	50 %
Sweden	63.04	41.83	41.83	3 %	0.00	0 %	- 21.21	- 34 %
United Kingdom	326.53	226.56	228.35	17 %	1.79	1 %	- 98.18	- 30 %
EU-15	1 595.87	1 337.59	1 316.32	100 %	- 21.28	- 2 %	- 279.55	- 18 %

Table 36 shows that France, Germany and Italy were responsible for 62 % of the NMVOC emissions in the category 3A 'Paint application'. Between 1990 and 2004, the EU-15 total emissions decreased by 27 %, all reporting countries reported reductions except Portugal, Spain, Ireland and Luxembourg.

Table 37 shows that France, Sweden and Germany were responsible for 57 % of the NMVOC emissions in the category 1A4b 'Residential'. Between 1990 and 2004, the EU-15 total emissions decreased by 20 %, all reporting countries reported reductions except Denmark, Finland and Italy.

Table 36 NMVOC sector overview for key source 3A 'Paint application'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	46.31	23.11	22.92	2 %	- 0.19	- 1 %	- 23.39	- 51 %
Belgium	49.02	23.16	21.05	2 %	- 2.11	- 9 %	- 27.96	- 57 %
Denmark	7.75	6.07	6.63	1 %	0.56	9 %	- 1.12	- 15 %
Finland	27.50	14.68	14.46	1 %	- 0.23	- 2 %	- 13.04	- 47 %
France	283.42	217.91	214.52	17 %	- 3.39	- 2 %	- 68.90	- 24 %
Germany	540.00	286.58	345.07	27 %	58.50	20 %	- 194.93	- 36 %
Greece	0.00	0.00	11.05	1 %	11.05	NA	11.05	NA
Ireland	6.88	10.45	8.71	1 %	- 1.74	- 17 %	1.84	27 %
Italy	270.79	221.65	221.30	17 %	- 0.35	0 %	- 49.50	- 18 %
Luxembourg	1.35	1.37	1.37	0 %	0.00	0 %	0.02	1 %
Netherlands	80.96	26.30	27.06	2 %	0.77	3 %	- 53.90	- 67 %
Portugal	14.36	29.72	30.77	2 %	1.05	4 %	16.41	114 %
Spain	172.46	206.28	201.50	16 %	- 4.78	- 2 %	29.04	17 %
Sweden	34.61	17.28	17.28	1 %	0.00	0 %	- 17.34	- 50 %
United Kingdom	208.81	121.67	121.84	10 %	0.17	0 %	- 86.97	- 42 %
EU-15	1 744.22	1 206.22	1 265.53	100 %	59.31	5 %	- 478.69	- 27 %

Note: Notation key NA stands for 'not applicable'.

Table 37 NMVOC sector overview for key source 1A4b 'Residential'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	57.31	35.27	33.94	5 %	- 1.34	- 4 %	- 23.37	- 41 %
Belgium	8.83	7.10	7.03	1 %	- 0.07	- 1 %	- 1.81	- 20 %
Denmark	13.22	20.47	21.29	3 %	0.82	4 %	8.07	61 %
Finland	22.18	27.46	27.31	4 %	- 0.16	- 1 %	5.13	23 %
France	210.23	199.76	196.25	31 %	- 3.52	- 2 %	- 13.98	- 7 %
Germany	108.82	62.47	60.51	10 %	- 1.96	- 3 %	- 48.30	- 44 %
Greece	14.55	14.36	14.36	2 %	0.00	0 %	- 0.19	- 1 %
Ireland	8.92	3.65	4.22	1 %	0.57	16 %	- 4.70	- 53 %
Italy	29.36	34.79	40.27	6 %	5.47	16 %	10.91	37 %
Luxembourg	0.83	0.68	0.68	0 %	0.00	0 %	- 0.15	- 18 %
Netherlands	11.42	8.64	8.62	1 %	- 0.01	0 %	- 2.80	- 24 %
Portugal	21.92	19.61	19.76	3 %	0.15	1 %	- 2.16	- 10 %
Spain	40.77	38.86	38.89	6 %	0.03	0 %	- 1.88	- 5 %
Sweden	138.50	110.61	104.09	17 %	- 6.52	- 6 %	- 34.41	- 25 %
United Kingdom	100.49	51.76	52.64	8 %	0.88	2 %	- 47.85	- 48 %
EU-15	787.35	635.49	629.85	100 %	- 5.64	- 1 %	- 157.49	- 20 %

Table 38 shows that the United Kingdom and Italy were responsible for 46 % of the NMVOC emissions in the category 1B2 'Oil and Natural Gas'. Between 1990 and 2004, the EU-15 total emissions decreased by 49 %, although some countries reported increases during this period.

Table 39 shows that Spain, France and Italy were responsible for 61 % of the NMVOC emissions in the category 3C 'Chemical Products, Manufacture and Processing'. Between 1990 and 2004, the EU-15 total emissions decreased by 11 %, although Portugal and Spain reported increasing emissions.

Table 38 NMVOC sector overview for key source 1B2 'Oil and natural gas'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	12.22	3.44	3.27	1 %	- 0.17	- 5 %	- 8.94	- 73 %
Belgium	33.00	19.19	17.37	3 %	- 1.82	- 9 %	- 15.63	- 47 %
Denmark	10.88	14.91	16.45	3 %	1.53	10 %	5.57	51 %
Finland	32.54	8.22	8.03	1 %	- 0.19	- 2 %	- 24.52	- 75 %
France	164.92	73.06	70.35	11 %	- 2.71	- 4 %	- 94.57	- 57 %
Germany	277.23	53.34	50.98	8 %	- 2.36	- 4 %	- 226.25	- 82 %
Greece	0.00	0.00	28.96	5 %	28.96	NA	28.96	NA
Ireland	3.90	6.77	6.86	1 %	0.08	1 %	2.96	76 %
Italy	117.95	78.12	77.72	13 %	- 0.40	- 1 %	- 40.23	- 34 %
Luxembourg	1.42	0.69	0.69	0 %	0.00	0 %	- 0.73	- 51 %
Netherlands	54.94	20.06	20.35	3 %	0.28	1 %	- 34.60	- 63 %
Portugal	19.13	25.18	24.93	4 %	- 0.25	- 1 %	5.79	30 %
Spain	62.26	66.56	66.91	11 %	0.35	1 %	4.65	7 %
Sweden	31.27	14.31	13.58	2 %	- 0.73	- 5 %	- 17.69	- 57 %
United Kingdom	380.71	229.47	207.95	34 %	- 21.53	- 9 %	- 172.76	- 45 %
EU-15	1 202.38	613.33	614.39	100 %	1.06	0 %	- 587.99	- 49 %

Note: Notation key NA stands for 'not applicable'.

Table 39 NMVOC sector overview for key source 3C 'Chemical products, manufacture and processing'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	18.76	11.75	11.75	3 %	- 0.01	0 %	- 7.01	- 37 %
Belgium	7.60	6.23	5.46	2 %	- 0.77	- 12 %	- 2.14	- 28 %
Denmark	0.88	0.65	0.74	0 %	0.09	14 %	- 0.14	- 16 %
Finland	3.95	3.35	3.94	1 %	0.59	18 %	- 0.01	0 %
France	72.68	53.99	52.09	15 %	- 1.90	- 4 %	- 20.59	- 28 %
Germany	70.00	46.32	47.37	14 %	1.05	2 %	- 22.63	- 32 %
Greece	0.00	0.00	IE	NA	NA	NA	NA	NA
Ireland	3.53	3.97	2.52	1 %	- 1.45	- 37 %	- 1.02	- 29 %
Italy	59.54	54.10	52.47	15 %	- 1.63	- 3 %	- 7.07	- 12 %
Luxembourg	NO	0.09	0.09	0 %	0.00	0 %	NA	NA
Netherlands	0.85	NO	NO	NA	NA	NA	NA	NA
Portugal	28.98	45.59	46.89	14 %	1.30	3 %	17.91	62 %
Spain	67.71	93.98	102.54	30 %	8.56	9 %	34.83	51 %
Sweden	3.61	0.77	0.77	0 %	0.00	0 %	- 2.84	- 79 %
United Kingdom	47.99	15.20	15.13	4 %	- 0.07	0 %	- 32.86	- 68 %
EU-15	386.08	335.98	341.75	100 %	5.77	2 %	- 44.33	- 11 %

Note: Notation key NA stands for 'not applicable', NO for 'not occurring' and IE for 'included elsewhere'.

Table 40 shows that the United Kingdom, Spain and Germany were responsible for 62 % of the NMVOC emissions in the category 2D 'Other production'. Between 1990 and 2004, the EU-15 total emissions increased by 7 %, only Denmark, France, Italy and the Netherlands reported reductions.

Table 41 shows that Spain was responsible for 58 % of the NMVOC emissions in the category 2A 'Mineral products'. Between 1990 and 2004, the EU-15 total emissions increased by 36 %, mainly due to emissions reported by Spain and Greece.

Table 40 NMVOC sector overview for key source 2D 'Other production'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	2.29	2.57	2.57	1 %	0.00	0 %	0.28	12 %
Belgium	3.07	3.93	3.98	1 %	0.05	1 %	0.92	30 %
Denmark	0.58	0.52	0.53	0 %	0.01	2 %	- 0.05	- 8 %
Finland	5.29	4.73	5.47	2 %	0.74	16 %	0.18	3 %
France	33.31	31.67	32.76	12 %	1.09	3 %	- 0.55	- 2 %
Germany	42.21	40.91	42.79	15 %	1.88	5 %	0.58	1 %
Greece	0.00	0.00	4.41	2 %	4.41	NA	4.41	NA
Ireland	NE	NO	NO	NA	NA	NA	NA	NA
Italy	33.21	27.78	26.36	9 %	- 1.42	- 5 %	- 6.85	- 21 %
Luxembourg	0.12	0.25	0.12	0 %	- 0.13	- 52 %	0.00	0 %
Netherlands	7.11	4.92	4.64	2 %	- 0.28	- 6 %	- 2.47	- 35 %
Portugal	15.06	15.50	15.64	6 %	0.14	1 %	0.58	4 %
Spain	32.30	41.72	48.58	17 %	6.86	16 %	16.29	50 %
Sweden	9.42	10.52	10.36	4 %	- 0.16	- 2 %	0.94	10 %
United Kingdom	77.74	80.59	80.88	29 %	0.29	0 %	3.14	4 %
EU-15	261.72	265.62	279.10	100 %	- 13.48	- 5 %	17.38	7 %

Note: Notation key NA stands for 'not applicable', NO for 'not occurring' and NE for 'not estimated'.

Table 41 NMVOC sector overview for key source 2A 'Mineral products'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	IE	IE	IE	NA	NA	NA	NA	NA
Belgium	2.24	1.90	2.06	1 %	0.16	9 %	- 0.18	- 8 %
Denmark	0.55	0.56	0.57	0 %	0.01	1 %	0.02	3 %
Finland	7.16	1.62	0.95	0 %	- 0.67	- 42 %	- 6.21	- 87 %
France	19.44	21.17	21.60	9 %	0.43	2 %	2.16	11 %
Germany	1.88	1.65	1.56	1 %	- 0.09	- 5 %	- 0.32	- 17 %
Greece	0.00	0.00	47.69	20 %	47.69	NA	47.69	NA
Ireland	NE, NO	NO	NO	NA	NA	NA	NA	NA
Italy	9.18	11.56	11.86	5 %	0.30	3 %	2.68	29 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	1.04	0.15	0.15	0 %	0.00	3 %	- 0.89	- 85 %
Portugal	0.81	3.77	3.72	2 %	- 0.05	- 1 %	2.91	360 %
Spain	116.63	143.15	139.66	58 %	- 3.49	- 2 %	23.03	20 %
Sweden	6.41	0.75	1.08	0 %	0.32	43 %	- 5.34	- 83 %
United Kingdom	10.21	8.05	8.37	3 %	0.33	4 %	- 1.84	- 18 %
EU-15	175.55	194.33	239.27	100 %	44.94	23 %	63.72	36 %

Note: Notation key NA stands for 'not applicable', NO for 'not occurring' and NE for 'not estimated'.

Table 42 shows that the United Kingdom, Germany and France were responsible for 61 % of the NMVOC emissions in the category 2B 'Chemical industry'. Between 1990 and 2004, the EU-15 total emissions decreased by 47 %, all countries except Austria, Portugal and Spain reported decreases.

Table 43 shows that Italy was responsible for 61 % of the NMVOC emissions in the category 1A3dii 'National navigation'. Between 1990 and 2004, the EU-15 total emissions increased by 14 %, which is mainly due to an increase reported by France.

Table 42 NMVOC sector overview for key source 2B 'Chemical industry'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	8.29	12.34	12.34	6 %	0.00	0 %	4.05	49 %
Belgium	33.51	14.66	14.24	7 %	- 0.42	- 3 %	- 19.28	- 58 %
Denmark	0.39	0.03	0.03	0 %	0.01	24 %	- 0.36	- 92 %
Finland	9.36	3.96	3.08	2 %	- 0.88	- 22 %	- 6.28	- 67 %
France	40.51	34.82	34.76	17 %	- 0.06	0 %	- 5.75	- 14 %
Germany	44.12	64.55	35.00	17 %	- 29.55	- 46 %	- 9.11	- 21 %
Greece	0.00	0.00	1.97	1 %	1.97	NA	1.97	NA
Ireland	NA, NO	NO	NO	NA	NA	NA	NA	NA
Italy	18.46	4.30	4.10	2 %	- 0.19	- 4 %	- 14.36	- 78 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	33.34	10.04	9.61	5 %	- 0.43	- 4 %	- 23.72	- 71 %
Portugal	11.43	15.15	15.57	8 %	0.41	3 %	4.13	36 %
Spain	11.36	15.58	15.58	8 %	0.00	0 %	4.21	37 %
Sweden	5.88	3.51	3.75	2 %	0.23	7 %	- 2.13	- 36 %
United Kingdom	165.71	52.10	53.71	26 %	1.61	3 %	- 112.01	- 68 %
EU-15	382.37	231.04	203.73	100 %	- 27.30	- 12 %	- 178.63	- 47 %

Note: Notation key NA stands for 'not applicable' and NO for 'not occurring'.

Table 43 NMVOC sector overview for key source 1A3dii 'National navigation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	0.72	0.67	0.66	0 %	- 0.01	- 1 %	- 0.06	- 8 %
Belgium	0.36	0.39	0.39	0 %	0.00	0 %	0.03	9 %
Denmark	1.85	1.59	1.47	1 %	- 0.12	- 7 %	- 0.37	- 20 %
Finland	9.65	8.77	9.12	5 %	0.35	4 %	- 0.53	- 5 %
France	25.24	43.56	45.06	24 %	1.50	3 %	19.82	79 %
Germany	3.23	1.03	1.15	1 %	0.12	12 %	- 2.09	- 65 %
Greece	1.38	1.46	1.64	1 %	0.18	13 %	0.26	19 %
Ireland	0.12	0.09	0.08	0 %	- 0.01	- 7 %	- 0.04	- 34 %
Italy	107.55	120.41	115.69	61 %	- 4.72	- 4 %	8.13	8 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	2.93	3.30	3.30	2 %	0.00	0 %	0.37	13 %
Portugal	0.18	0.16	0.16	0 %	0.00	2 %	- 0.02	- 12 %
Spain	1.60	2.35	2.40	1 %	0.04	2 %	0.80	50 %
Sweden	10.06	7.07	6.82	4 %	- 0.25	- 3 %	- 3.24	- 32 %
United Kingdom	2.66	2.40	2.34	1 %	- 0.05	- 2 %	- 0.32	- 12 %
EU-15	167.52	193.25	190.29	100 %	- 2.96	- 2 %	22.76	14 %

Note: Notation key NA stands for 'not applicable'.

2.2.4 Key source categories for SO_x

Table 44 shows that the United Kingdom and Spain were responsible for 55 % of the SO_x emissions in the category 1A1a 'Public electricity and heat production'. Between 1990 and 2004, the EU-15 total emissions decreased by 70 %, all countries except Greece reported decreasing emissions.

Table 45 shows that the United Kingdom, France and Spain were responsible for 55 % of the SO_x emissions in the category 1A2 'Manufacturing industries and construction'. Between 1990 and 2004, the EU-15 total emissions decreased by 71 %, all countries reported decreasing emissions.

Table 44 SO_x sector overview for key source 1A1a 'Public electricity and heat production'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	11.79	4.26	3.85	0 %	- 0.41	- 10 %	- 7.94	- 67 %
Belgium	95.16	29.70	33.74	1 %	4.04	14 %	- 61.42	- 65 %
Denmark	126.19	16.97	9.77	0 %	- 7.21	- 42 %	- 116.42	- 92 %
Finland	69.64	51.02	40.39	2 %	- 10.64	- 21 %	- 29.25	- 42 %
France	340.51	124.33	113.11	4 %	- 11.22	- 9 %	- 227.40	- 67 %
Germany	2 411.39	245.20	235.41	9 %	- 9.78	- 4 %	- 2 175.98	- 90 %
Greece	276.70	393.23	379.45	15 %	- 13.78	- 4 %	102.75	37 %
Ireland	103.04	44.58	44.00	2 %	- 0.58	- 1 %	- 59.04	- 57 %
Italy	769.28	198.23	174.20	7 %	- 24.04	- 12 %	- 595.09	- 77 %
Luxembourg	0.14	0.02	0.03	0 %	0.01	50 %	- 0.11	- 79 %
Netherlands	44.25	13.98	13.61	1 %	- 0.37	- 3 %	- 30.64	- 69 %
Portugal	180.95	103.66	102.16	4 %	- 1.49	- 1 %	- 78.79	- 44 %
Spain	1 459.01	893.28	947.39	36 %	54.12	6 %	- 511.62	- 35 %
Sweden	19.77	9.63	8.73	0 %	- 0.90	- 9 %	- 11.04	- 56 %
United Kingdom	2728.93	661.31	495.81	19 %	- 165.50	- 25 %	- 2 233.12	- 82 %
EU-15	8 636.76	2 789.39	2 601.64	100 %	- 187.75	- 7 %	- 6 035.12	- 70 %

Table 45 SO_x sector overview for key source 1A2 'Manufacturing industries and construction'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	18.30	10.53	9.47	1 %	- 1.06	- 10 %	- 8.83	- 48 %
Belgium	94.63	37.13	38.81	5 %	1.69	5 %	- 55.81	- 59 %
Denmark	15.33	5.45	5.68	1 %	0.23	4 %	- 9.66	- 63 %
Finland	72.92	13.69	19.50	2 %	5.81	42 %	- 53.42	- 73 %
France	406.95	123.60	114.86	14 %	- 8.74	- 7 %	- 292.08	- 72 %
Germany	907.65	95.33	90.71	11 %	- 4.62	- 5 %	- 816.93	- 90 %
Greece	117.97	61.35	62.20	7 %	0.85	1 %	- 55.77	- 47 %
Ireland	35.19	10.60	7.17	1 %	- 3.42	- 32 %	- 28.02	- 80 %
Italy	302.90	88.00	83.13	10 %	- 4.87	- 6 %	- 219.77	- 73 %
Luxembourg	12.56	0.99	1.50	0 %	0.51	52 %	- 11.06	- 88 %
Netherlands	35.81	12.66	12.96	2 %	0.30	2 %	- 22.85	- 64 %
Portugal	80.90	37.96	43.49	5 %	5.53	15 %	- 37.42	- 46 %
Spain	349.44	159.66	190.32	22 %	30.66	19 %	- 159.12	- 46 %
Sweden	23.93	10.47	10.48	1 %	0.01	0 %	- 13.45	- 56 %
United Kingdom	422.15	140.26	158.04	19 %	17.78	13 %	- 264.11	- 63 %
EU-15	2 896.62	807.67	848.32	100 %	40.65	5 %	- 2 048.30	- 71 %

Table 46 shows that the Italy, France and Spain were responsible for 47 % of the SO_x emissions in the category 1A1b 'Petroleum refining'. Between 1990 and 2004, the EU-15 total emissions decreased by 51 %, all countries except Austria, Greece and Portugal reported decreasing emissions.

Table 47 shows that Italy, France and the United Kingdom were responsible for 62 % of the SO_x emissions in the category 1A4b 'Residential'. Between 1990 and 2004, the EU-15 total emissions decreased by 76 %, all countries reported decreasing emissions.

Table 46 SO_x sector overview for key source 1A1b 'Petroleum refining'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	2.25	3.68	3.84	1 %	0.15	4 %	1.58	70 %
Belgium	40.85	0.00	25.29	6 %	25.29	NA	- 15.56	- 38 %
Denmark	3.41	0.49	0.42	0 %	- 0.07	- 15 %	- 2.99	- 88 %
Finland	21.79	3.01	3.22	1 %	0.20	7 %	- 18.57	- 85 %
France	135.34	75.85	68.94	15 %	- 6.91	- 9 %	- 66.40	- 49 %
Germany	149.05	52.87	52.08	11 %	- 0.79	- 1 %	- 96.97	- 65 %
Greece	21.48	22.65	34.80	8 %	12.15	54 %	13.32	62 %
Ireland	0.76	0.46	0.70	0 %	0.24	51 %	- 0.06	- 8 %
Italy	192.21	73.78	72.26	16 %	- 1.52	- 2 %	- 119.95	- 62 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	59.56	29.51	32.18	7 %	2.67	9 %	- 27.38	- 46 %
Portugal	18.65	23.35	21.13	5 %	- 2.22	- 9 %	2.49	13 %
Spain	134.40	73.56	72.55	16 %	- 1.01	- 1 %	- 61.86	- 46 %
Sweden	7.72	5.78	5.81	1 %	0.03	0 %	- 1.92	- 25 %
United Kingdom	152.97	64.32	64.90	14 %	0.58	1 %	- 88.07	- 58 %
EU-15	940.44	454.20	458.11	100 %	3.91	1 %	- 482.32	- 51 %

Note: Notation key NA stands for 'not applicable'.

Table 47 SO_x sector overview for key source 1A4b 'Residential'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	25.92	7.95	7.14	4 %	- 0.81	- 10 %	- 18.79	- 72 %
Belgium	27.27	21.32	20.99	10 %	- 0.32	- 2 %	- 6.27	- 23 %
Denmark	6.42	1.80	1.75	1 %	- 0.05	- 3 %	- 4.67	- 73 %
Finland	4.67	1.82	1.91	1 %	0.08	5 %	- 2.76	- 59 %
France	78.46	37.28	37.22	19 %	- 0.06	0 %	- 41.24	- 53 %
Germany	449.61	62.44	54.48	27 %	- 7.96	- 13 %	- 395.13	- 88 %
Greece	16.29	18.72	2.37	1 %	- 16.35	- 87 %	- 13.92	- 85 %
Ireland	25.45	12.39	11.30	6 %	- 1.09	- 9 %	- 14.15	- 56 %
Italy	60.02	13.49	12.35	6 %	- 1.14	- 8 %	- 47.67	- 79 %
Luxembourg	0.59	0.42	0.43	0 %	0.01	2 %	- 0.16	- 27 %
Netherlands	1.13	0.50	0.50	0 %	0.00	- 1 %	- 0.63	- 56 %
Portugal	0.18	0.03	0.04	0 %	0.00	12 %	- 0.14	- 79 %
Spain	22.49	15.26	15.47	8 %	0.21	1 %	- 7.02	- 31 %
Sweden	8.77	2.23	2.01	1 %	- 0.22	- 10 %	- 6.76	- 77 %
United Kingdom	112.72	31.25	32.89	16 %	1.64	5 %	- 79.84	- 71 %
EU-15	839.98	226.91	200.84	100 %	- 26.08	- 11 %	- 639.15	- 76 %

Table 48 shows that France, Italy and Spain were responsible for 79 % of the SO_x emissions in the category 1B2 'Oil and natural gas'. Between 1990 and 2004, the EU-15 total emissions decreased by 41 %, all countries except Portugal reported decreasing emissions.

Table 49 shows that Italy, Spain and the United Kingdom were responsible for 76 % of the SO_x emissions in the category 1A3dii 'National navigation'. Between 1990 and 2004, the EU-15 total emissions decreased by 5 %, most countries reported decreasing emissions.

Table 48 SO_x sector overview for key source 1B2 'Oil and natural gas'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	2.00	0.15	0.14	0 %	- 0.01	- 4 %	- 1.86	- 93 %
Belgium	0.25	0.00	0.00	0 %	0.00	NA	- 0.25	- 100 %
Denmark	4.28	0.34	0.18	0 %	- 0.17	- 49 %	- 4.10	- 96 %
Finland	NA, NO	1.32	1.35	1 %	0.03	3 %	NA	NA
France	95.18	53.12	59.69	34 %	6.57	12 %	- 35.49	- 37 %
Germany	26.89	18.78	17.47	10 %	- 1.32	- 7 %	- 9.42	- 35 %
Greece	0.00	0.00	7.41	4 %	7.41	NA	7.41	NA
Ireland	NE, NO	NO	NE	NA	NA	NA	NA	NA
Italy	79.72	39.77	37.21	21 %	- 2.55	- 6 %	- 42.51	- 53 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	7.61	0.08	0.08	0 %	0.00	0 %	- 7.53	- 99 %
Portugal	1.30	7.13	7.15	4 %	0.02	0 %	5.85	452 %
Spain	64.43	41.65	41.75	24 %	0.10	0 %	- 22.68	- 35 %
Sweden	4.48	1.03	1.03	1 %	0.00	0 %	- 3.44	- 77 %
United Kingdom	7.78	1.23	1.35	1 %	0.12	10 %	- 6.43	- 83 %
EU-15	293.90	164.61	174.81	100 %	10.20	6 %	- 119.09	- 41 %

Note: Notation key NA stands for 'not applicable', NE for 'not estimated' and NO for 'not occurring'.

Table 49 SO_x sector overview for key source 1A3dii 'National navigation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	0.04	0.02	0.02	0 %	0.00	0 %	- 0.01	- 31 %
Belgium	0.31	0.40	0.39	0 %	0.00	- 1 %	0.08	27 %
Denmark	5.53	1.93	2.26	1 %	0.33	17 %	- 3.28	- 59 %
Finland	1.38	1.47	1.14	1 %	- 0.33	- 22 %	- 0.24	- 18 %
France	4.72	2.90	2.43	1 %	- 0.47	- 16 %	- 2.29	- 48 %
Germany	2.04	0.00	0.00	0 %	0.00	13 %	- 2.04	- 100 %
Greece	18.61	22.62	27.48	17 %	4.86	21 %	8.87	48 %
Ireland	1.18	0.37	0.34	0 %	- 0.02	- 7 %	- 0.84	- 71 %
Italy	77.94	55.36	55.31	34 %	- 0.05	0 %	- 22.63	- 29 %
Luxembourg	0.01	0.01	0.01	0 %	0.00	0 %	0.00	0 %
Netherlands	0.47	0.69	0.69	0 %	0.00	0 %	0.21	45 %
Portugal	0.30	0.22	0.23	0 %	0.01	2 %	- 0.07	- 24 %
Spain	28.51	37.86	38.57	23 %	0.72	2 %	10.06	35 %
Sweden	5.02	4.16	4.01	2 %	- 0.15	- 4 %	- 1.01	- 20 %
United Kingdom	27.75	24.33	31.84	19 %	7.51	31 %	4.08	15 %
EU-15	173.80	152.32	164.72	100 %	12.40	8 %	- 9.08	- 5 %

Table 50 shows that Germany and France were responsible for 51 % of the SO_x emissions in the category 1A4a 'Commercial/institutional'. Between 1990 and 2004, the EU-15 total emissions decreased by 84 %, all countries except Belgium reported decreasing emissions.

Table 51 shows that Germany and Portugal were responsible for 49 % of the SO_x emissions in the category 2B 'Chemical industry'. Between 1990 and 2004, the EU-15 total emissions decreased by 63 %, all countries except Portugal reported decreasing emissions.

Table 50 SO_x sector overview for key source 1A4a 'Commercial/institutional'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	4.95	2.54	1.80	2 %	- 0.75	- 29 %	- 3.16	- 64 %
Belgium	3.10	4.33	4.29	5 %	- 0.05	- 1 %	1.18	38 %
Denmark	1.88	0.40	0.26	0 %	- 0.13	- 33 %	- 1.62	- 86 %
Finland	11.57	2.11	2.28	3 %	0.17	8 %	- 9.28	- 80 %
France	45.77	22.77	24.59	28 %	1.82	8 %	- 21.18	- 46 %
Germany	344.49	22.51	20.93	23 %	- 1.59	- 7 %	- 323.57	- 94 %
Greece	2.41	2.57	1.79	2 %	- 0.78	- 30 %	- 0.62	- 26 %
Ireland	11.00	5.40	4.67	5 %	- 0.73	- 13 %	- 6.33	- 58 %
Italy	28.95	6.58	6.69	7 %	0.11	2 %	- 22.26	- 77 %
Luxembourg	0.59	0.42	0.43	0 %	0.01	2 %	- 0.16	- 27 %
Netherlands	2.02	0.16	0.18	0 %	0.02	13 %	- 1.84	- 91 %
Portugal	4.17	3.08	3.38	4 %	0.30	10 %	- 0.79	- 19 %
Spain	18.12	13.74	13.78	15 %	0.03	0 %	- 4.34	- 24 %
Sweden	4.04	0.35	0.29	0 %	- 0.06	- 18 %	- 3.76	- 93 %
United Kingdom	79.49	7.82	4.01	4 %	- 3.81	- 49 %	- 75.48	- 95 %
EU-15	562.56	94.79	89.36	100 %	- 5.43	- 6 %	- 473.20	- 84 %

Table 51 SO_x sector overview for key source 2B 'Chemical industry'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	1.56	0.77	0.77	1 %	0.00	0 %	- 0.80	- 51 %
Belgium	18.00	4.63	4.62	6 %	- 0.01	0 %	- 13.38	- 74 %
Denmark	0.33	0.00	0.00	0 %	0.00	NA	- 0.33	- 100 %
Finland	16.00	6.41	3.55	5 %	- 2.86	- 45 %	- 12.45	- 78 %
France	23.80	6.73	5.09	7 %	- 1.64	- 24 %	- 18.70	- 79 %
Germany	26.05	27.24	21.56	28 %	- 5.68	- 21 %	- 4.49	- 17 %
Greece	0.00	0.00	2.34	3 %	2.34	NA	2.34	NA
Ireland	NA, NO	NO	NO	NA	NA	NA	NA	NA
Italy	60.80	7.50	7.85	10 %	0.35	5 %	- 52.95	- 87 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	3.39	NO	0.00	0 %	NA	NA	- 3.39	- 100 %
Portugal	7.56	15.65	16.54	21 %	0.90	6 %	8.98	119 %
Spain	9.76	6.76	7.27	9 %	0.52	8 %	- 2.48	- 25 %
Sweden	5.98	2.93	0.64	1 %	- 2.29	- 78 %	- 5.34	- 89 %
United Kingdom	39.02	9.51	7.41	10 %	- 2.10	- 22 %	- 31.61	- 81 %
EU-15	212.25	88.12	77.64	100 %	- 10.48	- 12 %	- 134.61	- 63 %

Note: Notation key NA stands for 'not applicable' and NO for 'not occurring'.

Table 52 shows that France, Italy and Spain were responsible for 78 % of the SO_x emissions in the category 1A3b 'Road transportation'. Between 1990 and 2004, the EU-15 total emissions decreased by 88 %, all countries reported decreasing emissions.

Table 53 shows that Germany was responsible for 47 % of the SO_x emissions in the category 1A1c 'Manufacture of solid fuels and other energy industries'. Between 1990 and 2004, the EU-15 total emissions decreased by 91 %; a large contribution to this reduction was made by Germany.

Table 52 SO_x sector overview for key source 1A3b 'Road transportation'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	3.76	2.09	0.78	1 %	- 1.32	- 63 %	- 2.98	- 79 %
Belgium	14.89	0.64	0.65	1 %	0.00	1 %	- 14.25	- 96 %
Denmark	5.77	0.37	0.38	1 %	0.01	3 %	- 5.39	- 93 %
Finland	5.26	0.14	0.09	0 %	- 0.05	- 38 %	- 5.17	- 98 %
France	139.50	23.87	24.16	36 %	0.29	1 %	- 115.34	- 83 %
Germany	90.20	0.82	0.83	1 %	0.01	1 %	- 89.37	- 99 %
Greece	12.92	2.56	2.56	4 %	0.00	0 %	- 10.36	- 80 %
Ireland	5.24	1.47	1.35	2 %	- 0.12	- 8 %	- 3.89	- 74 %
Italy	131.17	13.68	14.51	22 %	0.82	6 %	- 116.66	- 89 %
Luxembourg	0.39	0.13	0.12	0 %	- 0.01	- 8 %	- 0.27	- 69 %
Netherlands	12.56	0.92	0.94	1 %	0.02	2 %	- 11.62	- 92 %
Portugal	12.16	3.38	3.39	5 %	0.02	0 %	- 8.77	- 72 %
Spain	54.28	12.87	13.56	20 %	0.69	5 %	- 40.72	- 75 %
Sweden	6.77	0.47	0.47	1 %	- 0.01	- 1 %	- 6.30	- 93 %
United Kingdom	63.88	3.76	3.51	5 %	- 0.25	- 7 %	- 60.37	- 94 %
EU-15	558.74	67.19	67.29	100 %	0.11	0 %	- 491.45	- 88 %

Table 53 SO_x sector overview for key source 1A1c 'Manufacture of solid fuels and other energy industries'

	Emissions (Gg)			Share in EU-15 emissions in 2004 (%)	Change 2003–2004		Change 1990–2004	
	1990	2003	2004		(Gg)	(%)	(Gg)	(%)
Austria	0.00	0.03	0.00	0 %	- 0.03	- 100 %	0.00	- 100 %
Belgium	7.10	1.98	1.98	4 %	0.00	0 %	- 5.12	- 72 %
Denmark	0.00	0.01	0.01	0 %	0.00	10 %	0.01	216 %
Finland	0.80	NA	0.00	0 %	NA	NA	- 0.80	- 100 %
France	21.37	6.64	5.83	10 %	- 0.81	- 12 %	- 15.53	- 73 %
Germany	538.40	25.34	26.25	47 %	0.90	4 %	- 512.15	- 95 %
Greece	0.00	0.00	NO	NA	NA	NA	NA	NA
Ireland	0.10	NO	0.30	1 %	NA	NA	0.20	200 %
Italy	39.28	11.51	12.00	21 %	0.49	4 %	- 27.28	- 69 %
Luxembourg	0.00	0.00	0.00	0 %	0.00	NA	0.00	NA
Netherlands	1.25	0.01	0.01	0 %	0.00	6 %	- 1.24	- 99 %
Portugal	1.32	0.00	0.00	0 %	0.00	NA	- 1.32	- 100 %
Spain	10.60	19.57	5.18	9 %	- 14.40	- 74 %	- 5.42	- 51 %
Sweden	0.44	0.38	0.43	1 %	0.05	13 %	- 0.01	- 3 %
United Kingdom	6.05	3.95	4.38	8 %	0.44	11 %	- 1.67	- 28 %
EU-15	626.71	69.42	56.37	100 %	- 13.05	- 19 %	- 570.33	- 91 %

Note: Notation key NA stands for 'not applicable' and NO for 'not occurring'.

3 Reporting under the EU National Emission Ceilings Directive

3.1 Requirements of the Directive

Under Article 7 of the national emission ceilings directive (NECD), Member States are required to prepare and update emission inventories on an annual basis. Table 54 includes the national ceilings for each Member State according to the directive as amended by the Accession Treaty ⁽⁵⁾. All of the ceilings under the NEC for the Member States are equal to or lower than those under the LRTAP Convention.

Further, according to the directive, the Commission, assisted by the EEA, shall establish inventories and make them publicly available.

3.2 Data basis of the European Community NEC Inventory

Table 55 provides an overview of available NEC emission data submissions by 23 June 2006. It shows that for the 2006 Inventory, 22 out of 25 Member States provided NEC data. The official reporting date to the European Commission for Member State NEC submissions is 31 December of each year.

Table 56 provides an overview of NEC national programmes and projections available by 23 June 2006.

Table 54 National EU emission ceilings for SO₂, NO_x, NMVOC and NH₃ (in Gg) to be attained by 2010

Member State	SO ₂	NO _x	VOC	NH ₃
Austria	39	103	159	66
Belgium	99	176	139	74
Denmark	55	127	85	69
Finland	110	170	130	31
France	375	810	1 050	780
Germany	520	1 051	995	550
Greece	523	344	261	73
Ireland	42	65	55	116
Italy	475	990	1 159	419
Luxembourg	4	11	9	7
Netherlands	50	260	185	128
Portugal	160	250	180	90
Spain	746	847	662	353
Sweden	67	148	241	57
United Kingdom	585	1 167	1 200	297
EU-15	3 850	6 519	6 510	3 110
Cyprus	39	23	14	9
Czech Republic	265	286	220	80
Estonia	100	60	49	29
Hungary	500	198	137	90
Latvia	101	61	136	44
Lithuania	145	110	92	84
Malta	9	8	12	3
Poland	1 397	879	800	468
Slovakia	110	130	140	39
Slovenia	27	45	40	20
EU-25	6 543	8 319	8 150	3 976

⁽⁵⁾ Accession Treaty AA2003/ACT/Annex II/en 2073 — page 153.

Table 55 Date of receipt by the European Commission and/or the EEA, years covered and NFR tables available from Member States by 23 June 2006 under NEC Directive

EU-15 Member State	Submission date			Latest data available	Years covered	Gases covered	Format emissions
	Uploaded to CDR	Not in CDR but e-mailed to the EC	Not in CDR but e-mailed to EEA-ETC/ACC				
Austria	30 Dec 2005			2004	1990–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Belgium	23 Dec 2005			2004	1990, 1995, 2001–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Denmark		21 Dec 2005	21 Dec 2005	2004	1980–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Finland		8 Dec 2005	8 Dec 2005	2003	2003	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	New NFR
France	30 Dec 2005			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	New NFR
	15 Feb 2006			2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	New NFR
		24 Mar 2006		2004	1980–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	New NFR
Germany	22 June 2006			2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM, POPs	New NFR
Greece		15 Feb 2006		2004	2004	NO _x , CO, NMVOC, SO _x	New NFR
Ireland	16 Jan 2006			2004	2001–2004	NO _x , CO, NMVOC, SO _x , NH ₃	New NFR
Italy		31 May 2005		2003	1990–2003	NO _x , CO, NMVOC, SO _x , NH ₃	New NFR
		8 May 2006 (CIRCA)		2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Luxembourg			24 Aug 2006	2004	2003–2004	NO _x , NMVOC, SO ₂ , NH ₃	Excel table
Netherlands	22 Dec 2005			2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Portugal		24 Mar 2006	24 Mar 2006	2004	1990–2004	NO _x , CO, NMVOC, SO _x , NH ₃ , PM, HM	New NFR
Spain	20 June 2006	8 June 2006		2004	1990–2004	NO _x , NMVOC, SO _x , NH ₃	1990–1999 Totals; 2000–2004 new NFR
Sweden	20 Dec 2005			2004	1988–2004	NO _x , CO, NMVOC, SO _x , NH ₃	New NFR
United Kingdom	11 Jan 2006			2004	2001–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR

Note: Emission data on CO, POP, HM, and PM are voluntarily reported by Member States.

New Member State	Submission date			Latest data available	Years covered	Gases covered	Format emissions
	Uploaded to CDR	Not in CDR but e-mailed to the EC	Not in CDR but e-mailed to EEA-ETC/ACC				
Cyprus		25 Apr 2006		2004	2000–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
		15 June 2006		2004	2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Czech Republic							
Estonia	5 Jan 2006			2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Hungary	28 Dec 2005			2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	Totals
Latvia	30 Dec 2005			2004	1990–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Lithuania	30 Dec 2005			2004	2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Malta	4 May 2006			2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Poland							
Slovakia	15 Dec 2005			2004	2003–2004	NO _x , NMVOC, SO _x , NH ₃	New NFR
Slovenia	27 Dec 2005			2004	2002–2004	NO _x , CO, NMVOC, SO _x , NH ₃	New NFR

Table 56 NEC national programmes and NEC reports reported in 2006 by Member States by 23 June 2006

EU-15 Member States	National programmes	Projections	Background data projections
Austria		Sectoral (2010)	Yes
Belgium			
Denmark		Totals (2010)	
Finland			
France		Totals (2010)	Yes
Germany			
Greece			
Ireland			
Italy			
Luxembourg			
Netherlands		Totals (2010)	Only for use within CAFÉ project
Portugal			
Spain			
Sweden		Totals (2010)	
United Kingdom		Sectoral (2010)	
New Member States	National programmes	Projections	Background data projections
Cyprus	2005 report		
Czech Republic			
Estonia		Totals (2010)	
Hungary		Totals (2010)	
Latvia		Sectoral (2010)	
Lithuania		Totals (2010)	
Malta			
Poland			
Slovenia	Yes	Totals	
Slovakia		Totals	

Table 57 shows that a more detailed NEC Inventory cannot be compiled because for some Member States no NEC submissions are available. EU-15 totals are available for the years 2001 and 2002.

3.3 NEC emission trends

Tables 58-61 show the NEC emission trends of the EC Member States for NO_x, NMVOCs, SO_x and NH₃ ⁽⁶⁾.

NO_x emissions of all EU-15 Member States except Greece exceeded the national emission ceilings in 2004. France, Germany, Italy, Spain and the United Kingdom are the largest emitters of NO_x. Germany (46 %), France (33 %) and Italy (40 %) had important

decreases between 1990 and 2004. Between 2003 and 2004, the trend for all countries reporting NO_x emissions is decreasing, except for Spain (Table 58).

NO_x emission of the new Member States (EU-10) except Slovenia and Malta were lower than their national emission ceilings in 2004. The Czech Republic and Poland did not report NO_x emissions for 2004 (Table 58).

Total trends and numbers for NO_x cannot be given because of a lack of data in time series; Austria, Denmark, France, Germany, Greece, Italy, Portugal, Spain, Sweden and Latvia are the only countries reporting the entire time series (Table 58) (Note: it is not a requirement under NEC that Member States report a complete time series from 1990).

Table 57 Data availability as by 10 September

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Belgium	INV06					INV06					INV05	INV06	INV06	INV06	INV06
Cyprus											INV06	INV06	INV06	INV06	INV06
Czech Republic															
Denmark	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Estonia														INV06	INV06
Finland											INV04	INV04	*)	INV06	
France	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Germany	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Greece	INV05	INV05	INV05	INV05	INV05	INV05	INV05	INV05	INV05	INV05	INV05	INV05	INV05		INV06
Hungary														INV06	INV06
Ireland												INV06	INV06	INV06	INV06
Italy	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Latvia	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Lithuania													INV05	INV05	INV06
Luxembourg												INV05	INV05	INV06	INV06
Malta														INV06	INV06
Netherlands												INV04	INV05	INV06	INV06
Poland															
Portugal	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Slovakia														INV06	INV06
Slovenia													INV06	INV06	INV06
Spain	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
Sweden	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06	INV06
United Kingdom											INV04	INV06	INV06	INV06	INV06

*) Finish Environment Institute (2004).

Note: INV06 resp. INV05 are standing for the reports submitted for 2006 resp. 2005 containing emission data from 1990–2004 resp. 1990–2003.

⁽⁶⁾ Note that for some Member States NEC estimates differ from LRTAP Convention figures (see Chapter 4.6).

Table 58 NEC emission trends of EC Member States of NO_x in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	221	218	209	200	196	190	187	189	183	178	172	172	168	169	164
Belgium	382	NE	NE	NE	NE	372	NE	NE	NE	NE	329	316	300	298	298
Denmark	273	323	280	279	277	262	300	254	232	215	198	194	190	198	181
Finland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	214	215	211	219	204
France	1 827	1 886	1 851	1 738	1 692	1 640	1 613	1 548	1 529	1 459	1 388	1 333	1 280	1 242	1 217
Germany	2 878	2 648	2 492	2 383	2 236	2 131	2 050	1 976	1 940	1 916	1 855	1 763	1 674	1 605	1 554
Greece	300	312	315	314	321	321	326	332	350	337	330	344	341	343	317
Ireland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	135	125	120	119
Italy	1 947	2 000	2 019	1 921	1 840	1 808	1 732	1 654	1 553	1 456	1 378	1 367	1 276	1 245	1 173
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	17	18	17	15
Netherlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	420	396	393	385
Portugal	243	257	277	266	265	274	268	267	278	287	285	286	294	271	271
Spain	1 150	1 187	1 221	1 201	1 218	1 242	1 204	1 257	1 268	1 328	1 347	1 332	1 392	1 380	1 422
Sweden	306	295	293	281	283	271	261	250	242	230	217	211	206	203	197
United Kingdom	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1 512	1 799	1 693	1 685	1 621
EU-15	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	9 904	9 564	9 387	9 139
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	22	21	22	18
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Estonia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	39	38
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	180	187
Latvia	70	57	47	47	42	41	43	41	39	37	35	38	37	39	39
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	51	53	48
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	12	12
Poland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	98	98
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	58	56	57
EU-10	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
EU-25	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Note: Notation key NE stands for 'not estimated'.

Concerning the EU-15 Member States, only the United Kingdom's NMVOC emissions were lower than their national emission ceilings. All other Member States had NMVOC emissions exceeding their national emission ceilings. The trend between 1990 and 2004 is decreasing in the EU-15 (Table 59).

Regarding the new Member States, only NMVOC emissions in Hungary and Slovenia exceeded the national emission ceilings. The Czech Republic and

Poland did not report NMVOC emissions in 2004 (Table 59).

Total trends and numbers for NMVOC cannot be given because of a lack of data in time series; Austria, Denmark, France, Germany, Italy, Portugal, Spain, Sweden and Latvia were the only countries reporting the whole time series (Table 59) (Note: it is not a requirement under NEC that Member States report a complete time series from 1990).

Table 59 NEC emission trends of EC Member States of NMVOCs in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	285	269	242	238	221	221	215	203	189	178	178	180	173	171	168
Belgium	359	NE	NE	NE	NE	311	NE	NE	NE	NE	245	250	237	231	221
Denmark	166	167	165	161	156	152	152	145	135	130	127	122	118	116	116
Finland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	160	157	152	145	139
France	2 415	2 394	2 345	2 241	2 119	2 033	1 944	1 871	1 813	1 733	1 659	1 588	1 476	1 412	1 368
Germany	3 584	3 043	2 775	2 520	2 247	2 100	1 974	1 913	1 842	1 714	1 569	1 476	1 381	1 272	1 268
Greece	280	288	296	302	308	305	309	308	312	307	299	294	289	288	332
Ireland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	78	71	67	63
Italy	2 032	2 093	2 150	2 112	2 050	2 023	1 972	1 909	1 803	1 714	1 544	1 456	1 346	1 299	1 263
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	14	13	13	12
Netherlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	251	232	224	218
Portugal	273	277	287	280	287	288	290	293	293	285	282	284	286	287	287
Spain	1 132	1 166	1 174	1 102	1 124	1 072	1 086	1 101	1 156	1 144	1 117	1 089	1 074	1 078	1 072
Sweden	443	428	417	395	373	362	349	330	303	293	282	270	264	265	255
United Kingdom	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1 683	1 252	1 175	1 073	1 024
EU-15	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	8 761	8 287	7 941	7 805
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	16	16	16	12
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Estonia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	40	41
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	155	154
Latvia	103	82	75	61	67	65	67	67	66	66	60	59	61	62	66
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	72	74	41
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	8	6
Poland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	82	85
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	48	46	46
EU-10	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
EU-25	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Note: Notation key NE stands for 'not estimated'.

SO_x emissions reported for Austria, Denmark, Finland and Sweden were below the national emission ceilings in 2004, all others are above their SO_x ceilings. Germany achieved important reductions (– 89 %) between 1990 and 2004. The trend between 1990 and 2004 is decreasing in the EU-15 (Table 60).

Regarding the new Member States, SO_x emissions in Estonia, Hungary, Latvia, Lithuania and Slovakia were below the national emission ceilings. The Czech Republic and Poland did not report NMVOC

emissions in 2004. Emissions between 2003 and 2004 in all reporting countries decreased (Table 60).

Total trends and numbers for SO_x cannot be given because of a lack of data in time series; Austria, Denmark, France, Germany, Italy, Portugal, Spain, Sweden and Latvia are the only countries reporting the whole time series (Table 60). (Note: it is not a requirement under NEC for Member States to report a complete time series from 1990).

Table 60 NEC emission trends of EC Member States of SO_x in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	75	71	55	53	48	47	44	40	35	33	31	32	32	33	28
Belgium	363	NE	NE	NE	NE	262	NE	NE	NE	NE	172	169	158	154	161
Denmark	178	237	182	148	146	136	171	99	76	55	28	26	25	32	24
Finland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	76	85	83	99	82
France	1 332	1 437	1 256	1 099	1 033	967	943	795	816	704	612	549	509	504	483
Germany	5 289	3 920	3 222	2 859	2 401	1 708	1 426	1 197	956	776	630	628	588	595	559
Greece	487	525	544	542	513	536	523	518	527	544	493	502	513	545	529
Ireland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	126	96	77	71
Italy	1 795	1 677	1 578	1 477	1 388	1 320	1 209	1 133	995	899	753	708	632	528	496
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3	2	2	3
Netherlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	89	67	65	68
Portugal	317	308	370	316	296	332	270	292	341	341	306	294	294	200	203
Spain	2 105	2 103	2 073	1 953	1 906	1 761	1 545	1 730	1 576	1 590	1 450	1 427	1 532	1 255	1 329
Sweden	117	114	109	96	93	79	77	70	67	54	52	51	51	52	47
United Kingdom	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1 165	1 111	994	973	833
EU-15	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	5 800	5 577	5 114	4 917
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	53	50	51	46
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Estonia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	101	89
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	348	249
Latvia	97	81	66	65	64	47	53	39	34	29	10	8	6	5	4
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	43	43	37
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	33	17
Poland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	106	97
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	71	66	56
EU-10	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
EU-25	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Note: Notation key NE stands for 'not estimated'.

In the EU-15 Member States, Austria, France, Ireland, Portugal and Sweden NH₃ emissions were below the national emission ceiling in 2004. Greece did not report NH₃ emissions for 2004. The trend between 1990 and 2004 is decreasing in the EU-15 (Table 61).

NH₃ emissions were lower than the national emission ceilings in all new Member States in 2004, for which data was available (Table 61).

Total trends and numbers for NH₃ can not be given because of lack of data in time series; Austria, Denmark, France, Germany, Italy, Portugal, Spain, Sweden and Latvia are the only countries reporting the whole time series (Table 61) (Note: it is not a requirement under NEC that Member States report a complete time series from 1990).

Table 61 NEC emission trends of EC Member States of NH₃ in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	69	70	68	68	69	70	69	69	69	67	66	65	64	65	64
Belgium	112	NE	NE	NE	NE	103	NE	NE	NE	NE	79	84	82	79	74
Denmark	134	130	128	125	121	114	110	110	111	106	105	104	102	98	98
Finland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	33	33	33	33	32
France	787	772	777	757	766	772	775	789	788	780	789	775	778	750	742
Germany	758	670	653	654	633	642	645	636	644	650	646	659	649	648	639
Greece	79	78	75	75	73	85	73	71	74	73	74	74	73	NE	NE
Ireland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	117	115	114	114
Italy	405	417	412	421	416	417	411	426	428	436	425	434	435	433	426
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	7	5	5	5
Netherlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	142	136	130	134
Portugal	55	60	61	60	63	63	63	66	65	65	64	66	64	64	64
Spain	344	337	334	318	344	341	372	378	396	405	417	419	420	430	433
Sweden	55	55	55	62	62	64	61	62	61	59	58	57	57	56	56
United Kingdom	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	297	330	319	308	336
EU-15	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3 366	3 333	NE	NE
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	6	7	7	6	6
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Estonia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	10	10
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	67	66
Latvia	47	44	32	20	17	15	14	14	13	12	12	14	13	14	13
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	51	34	33
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1	1
Poland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	29	26
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	19	19	17
EU-10	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
EU-25	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Note: Notation key NE stands for 'not estimated'.

3.4 Recalculations

Tables 62 to 65 provide an overview of Member States' NO_x, NMVOC, SO_x, NH₃ contributions to EU-15 recalculations. The following tables represent the difference between data reported in 2006 and data reported in 2005. Empty fields indicate that one of the two submissions did not contain data, and '0' indicates that nothing has changed after recalculations.

It is important and necessary to identify inventory recalculations and to understand their origin in order to correctly evaluate the officially reported emission data. This is especially the case when emission ceiling targets are expressed in absolute terms, and not as percentage reduction targets. From

a country perspective, it is necessary to recalculate the whole of the time series when new information (i.e. activity or emission factor data) becomes available in order to provide comparable and consistent data. The magnitude of recalculations also provides some indication of the general uncertainty of the emissions.

Looking at the respective NO_x time series submitted in 2005 and 2006 major recalculations occurred in Germany (2000–2003), Belgium (2001), Austria (1998–2003), Denmark, France (2003), Italy (2003) and United Kingdom (2001–2003). The largest changes after recalculation reported Germany for 2000 (220 Gg), followed by the United Kingdom for 2001 (139 Gg), Austria in 2003 (60 Gg), Italy for 2003

(45 Gg) and Belgium for 2001 (33 Gg). Values for Greece, Ireland and Luxembourg did not change. The resulting recalculation for the EU-15 amounts to 314 Gg for 2001 and 227 Gg for 2002, which is equivalent to 3.2 % (2001) and 2.4 % (2002) of the EU-15 total (Table 62).

Major recalculations for NMVOC were reported for Germany (2000–2003), Denmark (1990–2003) and Sweden (1990–2003); Germany exhibited the largest changes after recalculation (– 188 Gg for 2003), Italy had one major recalculation for 2003 (53 Gg). In Greece and Luxembourg emission values were not recalculated. The resulting recalculation for the EU-15 amounted to – 171 Gg for 2001 and – 178 Gg for 2002, which is equivalent to 2.0 % (2001) and 2.2 % (2002) of the EU-15 total (Table 63).

Table 62 Member States contribution to NO_x recalculation (in Gg)

NO _x recalculations	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Austria	10	- 4	- 2	- 3	2	- 2	- 25	- 10	- 28	- 21	- 32	- 42	- 51	- 60
Belgium											0	33	- 2	- 1
Denmark	- 10	- 10	- 10	- 11	- 13	- 10	- 11	- 10	- 12	- 10	- 9	- 9	- 11	- 11
Finland											0	0	0	1
France	- 3	- 6	- 5	- 5	- 6	- 6	- 6	- 6	- 4	- 4	- 2	- 2	6	22
Germany											220	203	181	177
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ireland												0	0	0
Italy	22	22	22	21	22	23	7	6	7	11	11	14	15	45
Luxembourg												0	0	
Netherlands												0	0	3
Portugal	- 10	- 10	- 9	- 12	- 12	- 12	- 12	- 8	- 4	- 7	- 3	1	2	- 1
Spain											- 23	- 19	- 26	- 27
Sweden	- 9	- 10	- 6	- 3	- 4	- 4	- 1	- 1	- 1	- 1	- 2	- 3	- 2	- 3
United Kingdom											0	139	115	115
EU-15												314	227	

Table 63 Member States contribution to NMVOC recalculation (in Gg)

NMVOC recalculations	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Austria	- 1	- 4	- 3	- 1	0	0	- 1	0	- 2	- 2	- 3	- 5	- 9	- 11
Belgium											0	- 13	7	5
Denmark	- 63	- 61	- 58	- 58	- 57	- 48	- 56	- 55	- 38	- 39	- 45	- 18	- 28	- 42
Finland											0	0	0	- 2
France	- 1	- 1	- 1	- 1	1	0	- 2	- 3	- 6	- 6	- 2	2	1	12
Germany											- 128	- 117	- 113	- 188
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ireland												- 9	- 10	- 11
Italy	- 7	- 5	4	9	5	2	- 2	0	0	3	2	13	5	53
Luxembourg												0	0	
Netherlands												0	0	- 2
Portugal	13	9	10	9	9	9	10	10	11	11	13	14	15	21
Spain											3	- 8	- 17	- 21
Sweden	- 73	- 68	- 65	- 54	- 55	- 59	- 57	- 46	- 49	- 38	- 38	- 41	- 39	- 38
United Kingdom											0	11	9	- 15
EU-15												- 171	- 178	

Major changes after recalculations for SO_x emissions occurred in Italy, with the highest for 2003 (- 54 Gg) and in Spain for 2003 (- 65 Gg); the other Member States reported minor recalculations, in the range of - 20 Gg (Germany 2002) to 17 Gg (Belgium 2001). In Greece, Ireland and Luxembourg emission values were not recalculated. The resulting recalculation for the EU-15 amounts to - 17 Gg for 2001 and - 39 Gg for 2002, which is equivalent to - 0.3 % (2001) and - 0.7 % (2002) of the EU-15 total (Table 64).

The largest changes after recalculation for NH₃ occurred in Germany (max. 48 Gg for 2003) and Spain for 2001 and 2002 (38 Gg), in Italy for 1990 (- 24 Gg) and in Portugal for 1990 (- 25 Gg). Other countries reported smaller changes after recalculation. Data for Denmark, Greece, Luxembourg and Sweden were not recalculated. The resulting recalculation for the EU-15 amounts to 70 Gg for 2001 and 28 Gg for 2002, which is equivalent to - 2.1 % (2001 and 2002) of the EU-15 total (Table 65).

Table 64 Member States contribution to SO_x recalculation (in Gg)

SO _x recalculations	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Austria	- 1	0	- 2	- 2	- 1	- 2	- 2	- 2	- 2	- 3	- 2	- 2	- 1	- 2
Belgium											0	17	0	1
Denmark	1	1	1	1	1	0	0	0	0	0	0	0	0	1
Finland											0	0	0	- 11
France	2	- 14	- 8	- 6	- 8	- 7	- 6	- 5	2	3	7	5	9	12
Germany											- 4	- 13	- 20	- 19
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ireland												0	0	0
Italy	21	22	21	23	29	33	- 18	- 18	- 21	- 22	- 18	- 28	- 32	- 54
Luxembourg												0	0	
Netherlands												0	0	- 1
Portugal	- 6	- 5	- 5	- 4	- 3	- 3	- 3	- 1	- 2	- 2	- 1	0	0	- 1
Spain											- 10	10	12	- 65
Sweden	5	3	4	4	1	1	2	2	1	2	3	2	1	0
United Kingdom											0	- 7	- 8	- 5
EU-15												- 17	- 39	

Table 65 Member States contribution to NH₃ recalculation (in Gg)

NH ₃ recalculations	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Austria	11	11	11	11	10	11	11	11	10	11	11	10	10	10
Belgium											0	1	3	2
Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland											0	0	0	1
France	0	0	0	0	0	1	1	1	1	1	1	1	1	- 2
Germany											39	43	43	48
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ireland												- 5	- 4	- 2
Italy	- 24	- 18	- 16	- 9	- 9	- 10	- 8	- 8	- 7	0	- 8	- 12	- 12	- 15
Luxembourg												0	0	
Netherlands												0	0	2
Portugal	- 25	- 19	- 16	- 15	- 14	- 14	- 14	- 12	- 13	- 15	- 15	- 15	- 17	- 17
Spain											32	38	38	34
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom											0	9	9	9
EU-15												70	71	

3.5 Member State projections

For all EU-15 Member States, data on projections are available (see Table 66). Therefore, the EU-15 total projections for 2010 can be estimated. Additionally, seven new Member States reported projected emissions for 2010.

For the EU-15 as a whole, emission projections for SO₂ are below the emission ceiling included in the NEC Directive, whereas the projections for NO_x, NMVOC and NH₃ are above the emission ceilings. For the EU-15 Member States, projected SO_x emissions for 2010 exceed the emission ceilings in Belgium, Denmark, the Netherlands and Portugal. Projected NO_x emissions exceed the national

emission ceilings in most countries. Projected NH₃ emissions for 2010 are in most countries below the emissions ceilings, except for Belgium, Finland, Germany and Italy. The national emission ceilings for NMVOC are exceeded by Belgium, Finland, Germany, Ireland and Portugal.

Projections of Spain, Sweden and the United Kingdom meet their national emissions ceiling for all gases exactly.

Seven new Member States reported their projections for 2010, two more than last year. Projected emissions were smaller than the national emission ceilings, with the exception of the Czech Republic for NO_x and NH₃, as well Slovenia for NO_x.

Table 66 Member States projections for 2010 for SO₂, NO_x, NMVOC and NH₃ (in Gg)

Member State	SO _x (as SO ₂)	NO _x (as NO ₂)	NH ₃	NMVOC
Austria	25.62	172.94	52.89	152.18
Belgium **)	102	259	85	147
Denmark	56**)	142	63	83
Finland	81.5	203.6	32.4	138.8
France	375	810	780	1050
Germany **)	513	1126	585	1192
Greece **)	< 300	344	73	261
Ireland **)	42	94	110	66
Italy **)	434	1065	433	1117
Luxembourg **)	2.3	14.2	5.5	7.2
Netherlands	66	288	126	176
Portugal *) **)	165.1/170	248.6/261.5	88.3/91.2	239.9/264.7
Spain **)	746	847	353	662
Sweden **)	67	148	57	241
United Kingdom	585	1167	297	1200
EU-15	3 504.5/3 509.4	6 929.3/6 942.2	3 141.1/3 144.0	6 733.1/6 757.9
Czech Republic **)	247.4	333.9	80.7	204.1
Estonia	100	60	29	49
Hungary	350	198	70	137
Lithuania	145	110	84	92
Latvia	11.59	42.4	14.07	58.85
Slovenia	18.7	47.4	20.4	36.8
Slovakia	55	96	29.8	84

*) Emissions were projected based on a low and a high scenario.

**) Projections taken from last year's submission.

Note: Grey fields indicate emission projections exceeding NEC targets.

3.6 Differences between emission trends of NO_x, SO_x, NMVOC and NH₃ reported under LRTAP Convention and NEC

This chapter shows the absolute differences between data provided under CLTRAP and NEC (Table 63–66). In most cases data are identical, or a comparison is not applicable (NA), when an emission under one of the regulations is not reported. Resulting differences on the EU-15 level cannot be given, as for all pollutants some Member State NEC emission

data missing. In some cases different values under LRTAP Convention and NEC are reported but the difference is very small. As a result, the rounded difference amounts to zero.

Differences between NEC and LRTAP Convention emission data for NO_x occurred in Austria, France, Italy and Spain for 1990 and in Austria, France, the Netherlands and Spain for 2004 (Table 67).

Differences for NMVOC emissions between NEC and LRTAP Convention emission data occurred

Table 67 Differences between emissions trends of NO_x reported under LRTAP Convention and NEC for 1990 and 2004

NO _x in Gg	NEC 1990	CLRTAP 1990	Difference 1990	NEC 2004	CLRTAP 2004	Difference 2004
Austria	221	212	10	164	227	- 63
Belgium	382	382	0	298	298	0
Denmark	273	273	0	181	181	0
Finland	NE	298	NA	204	203	0
France	1 827	1 830	- 3	1 217	1 219	- 2
Germany	2 878	2 878	0	1 554	1 554	0
Greece	300	300	0	317	317	0
Ireland	NE	116	NA	119	119	0
Italy	1 947	1 943	4	1 173	1 173	0
Luxembourg	NE	23	NA	15	15	0
Netherlands	NE	552	NA	385	360	25
Portugal	243	243	0	271	271	0
Spain	1 150	1 217	- 67	1 422	1 535	- 113
Sweden	306	306	0	197	197	0
United Kingdom	NE	2 933	NA	1 621	1 621	0
EU-15	NE	13 504	NA	9 139	9 289	NA

Note: Notation key NE stands for 'not estimated'.

Table 68 Differences between emissions trends of NMVOC reported under LRTAP Convention and NEC for 1990 and 2004

NMVOC in Gg	NEC 1990	CLRTAP 1990	Difference 1990	NEC 2004	CLRTAP 2004	Difference 2004
Austria	285	284	0	168	172	- 4
Belgium	359	354	5	221	213	8
Denmark	166	166	0	116	116	0
Finland	NE	222	NA	139	141	- 3
France	2 415	2 414	1	1 368	1 367	0
Germany	3 584	3 584	0	1 268	1 268	0
Greece	280	280	0	332	332	0
Ireland	NE	103	NA	63	63	0
Italy	2 032	1 986	46	1 263	1 263	0
Luxembourg	NE	18	NA	12	10	2
Netherlands	NE	491	NA	218	216	2
Portugal	273	273	0	287	287	0
Spain	1 132	1 170	- 38	1 072	1 119	- 47
Sweden	443	443	0	255	255	0
United Kingdom	NE	2396	NA	1024	1 024	0
EU-15	NE	14 185	NA	7 805	7 847	NA

Note: Notation key NE stands for 'not estimated'.

in Belgium, France, Italy and Spain for 1990 and in Austria, Belgium, Finland, Luxembourg, the Netherlands and Spain for 2004 (Table 68).

Differences between NEC and LRTAP Convention emission data for SO_x occurred for 1990 in Austria, Belgium, France and Spain. For 2004, Austria, Finland, the Netherlands and Spain reported differences under NEC and LRTAP Convention regulations. Differences in Belgium for 1990 were

due to revised emissions factors of the Brussels coke plant used for the LRTAP Convention submission following Walloon case studies after the NEC submission (Table 69).

NH₃ emissions reported under LRTAP Convention and NEC are for 1990 different in Italy and Spain; for 2004, Finland and Spain show different data (Table 70).

Table 69 Differences between emissions trends of SO_x reported under LRTAP Convention and NEC for 1990 and 2004

SO _x in Gg	NEC 1990	CLRTAP 1990	Difference 1990	NEC 2004	CLRTAP 2004	Difference 2004
Austria	75	74	1	28	29	- 1
Belgium	363	361	2	161	161	0
Denmark	178	178	0	24	24	0
Finland	NE	273	NA	82	85	- 3
France	1 332	1 333	- 1	483	484	- 1
Germany	5 289	5 289	0	559	559	0
Greece	487	487	0	529	529	0
Ireland	NE	183	NA	71	71	0
Italy	1 795	1 795	0	496	496	0
Luxembourg	NE	15	NA	3	3	0
Netherlands	NE	189	NA	68	66	2
Portugal	317	317	0	203	203	0
Spain	2 105	2 180	- 75	1 329	1 360	- 31
Sweden	117	117	0	47	47	0
United Kingdom	NE	3 699	NA	833	833	0
EU-15	NE	16 491	NA	4 917	4 951	NA

Note: Notation key NE stands for 'not estimated' and NA for 'not applicable'.

Table 70 Differences between emissions trends of NH₃ reported under LRTAP Convention and NEC for 1990 and 2004

NH ₃ in Gg	NEC 1990	CLRTAP 1990	Difference 1990	NEC 2004	CLRTAP 2004	Difference 2004
Austria	69	69	0	64	64	0
Belgium	112	112	0	74	74	0
Denmark	134	134	0	98	98	0
Finland	NE	38	NA	32	33	- 1
France	787	787	0	742	742	0
Germany	758	758	0	639	639	0
Greece	79	79	0	NE	NE	NA
Ireland	NE	112	NA	114	114	0
Italy	405	465	- 60	426	426	0
Luxembourg	NE	8	NA	5	NE	NA
Netherlands	NE	249	NA	134	134	0
Portugal	55	55	0	64	64	0
Spain	344	347	- 3	433	436	- 4
Sweden	55	55	0	56	56	0
United Kingdom	NE	382	NA	336	336	0
EU-15	NE	3 649	NA	NE	NE	NA

Note: Notation key NE stands for 'not estimated' and NA for 'not applicable'.

4 Future improvements of the Inventory

The Inventory still suffers from incompleteness of Member States' data which does not allow preparation of a comprehensive inventory at European Community level. The compilation procedure itself has no formal QA/QC plan, but some routine checks are made mainly on timeliness, completeness and consistency. More detailed checks on LRTAP Convention and NEC data are made by EMEP/EEA in the annual review of emission data reported under the UNECE LRTAP Convention and the NEC Directive. During this review tests on completeness, timeliness, transparency, comparability, recalculations and sector specific aspects are made. The results are sent to the Member States for comments and/or clarifications (for the latest review report see EMEP 2006). The EC inventories benefit indirectly from this annual review procedure through the improvement of the quality of Member State submissions.

It is essential for the inventory preparation that the completeness of Member States' submissions

increases. In addition, more formal QA/QC procedures should be developed and uncertainty analyses could help to identify areas for further improvement. In order to compile uncertainty estimates for the EC Inventory, individual uncertainty analyses from the Member States' inventories are also required.

The EC/EEA plans to work with Member States to further improve inventory system and reporting procedures in order to improve the quality of data submitted to the LRTAP Convention.

Possibilities for further streamlining and harmonising of emission reporting, especially with the UNFCCC and the European Community greenhouse gas monitoring mechanism, should be explored. In addition, a strict implementation of Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants will contribute to improving the timeliness and quality of the European Community LRTAP Convention Inventory.

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Units and abbreviations

t	1 tonne (metric) = 1 megagram (Mg) = 10 ⁶ g
Mg	1 megagram = 10 ⁶ g = 1 tonne (t)
Gg	1 gigagram = 10 ⁹ g = 1 kilotonne (kt)
Tg	1 teragram = 10 ¹² g = 1 megatonne (Mt)
TJ	1 terajoule
Cd	cadmium
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
LRTAP Convention	Convention on Long-range Transboundary Air Pollution
CRF	common reporting format
EC	European Community
EEA	European Environment Agency
Eionet	European environmental information and observation network
EMEP	European monitoring evaluation programme
ETC/ACC	European Topic Centre on Air and Climate Change
EU	European Union
HFCs	hydrofluorocarbons
Hg	mercury
HM	heavy metals
INV05	NEC Inventory 2005
NECD	National Emission Ceilings Directive
NFR	nomenclature for reporting
NH ₃	ammonia
NMVOC	non-methane volatile organic compounds
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
N ₂ O	nitrous oxide
Pb	lead
PFCs	perfluorocarbons
PM	particulate matter
POP	persistent organic pollutants
QA/QC	quality assurance/quality control
SF ₆	sulphur hexafluoride
SO ₂	sulphur dioxide
SO _x	sulphur oxides
TSP	total suspended particles
Umweltbundesamt	Federal Environment Agency — Austria
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
VOC	volatile organic compounds

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