

Annual European Community CLRTAP emission inventory 1990–2002

**Submission to the Executive Body of the UNECE
Convention on long-range transboundary air pollution**



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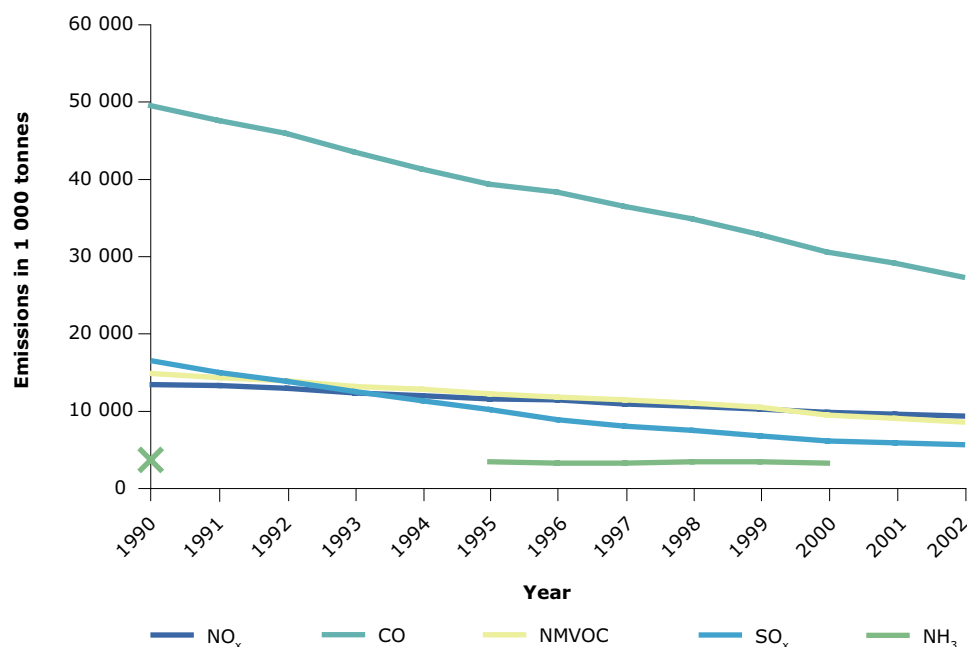
Summary

This report is the annual European Community CLRTAP emission inventory presenting the European Community air pollution data from the years 1990 to 2002. The report only covers the EU Member States before 1 May 2004 (EU15) because the formal reporting deadline to the LRTAP Convention was 15 February 2004. Due to data gaps, European totals were estimated for NO_x, CO, NMVOC_s, SO_x and NH₃ only. The figure and table below show the emission trends for NO_x, CO, NMVOCs and SO_x between 1990 and 2002, and for NH₃ for 1990 and 1995–2000. The greatest reductions in absolute terms were in CO emissions (22191 Gg), followed by SO_x (10803 Gg),

NMVOCs (6251 Gg) and NO_x (4093 Gg). The NH₃ emissions remained nearly stable (a reduction of 380 Gg) between 1990 and 2000.

This report also shows the data availability of the emission data under the European Community directive on national emission ceilings for certain atmospheric pollutants. At present, the data provided under this directive are not complete enough to compile a separate NEC inventory. Therefore, the present CLRTAP inventory data show the current status of the European Community progress towards the reduction targets of air pollutants in the European Community.

European Community emission trends for NO_x, CO, NMVOCs, SO_x between 1990 and 2002, and for NH₃ in 1990 and 1995–2000



Total European Community 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
NO _x	13 449	13 303	12 993	12 371	12 019	11 595	11 446	10 959	10 662	10 292	9 833	9 599	9 356
CO	49 561	47 652	45 977	43 544	41 342	39 399	38 348	36 516	34 903	32 859	30 584	29 176	27 370
NMVOC	14 854	14 364	13 951	13 227	12 833	12 260	11 836	11 466	11 067	10 522	9 511	9 061	8 603
SO _x	16 507	14 992	13 853	12 579	11 364	10 203	8 912	8 070	7 553	6 819	6 127	5 899	5 704
NH ₃	3 696	NE	NE	NE	NE	3 438	3 261	3 276	3 475	3 475	3 316	NE	NE

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 CLRTAP) was ratified by the European Community in 1979. The Convention does not include any binding commitments to undertake concrete measures for reducing specific pollutants. Under Article 2 of the Convention, however, '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 has set up a process for negotiating concrete measures to control specific pollutants through legally binding protocols. Since 1984, eight protocols have been adopted, five of which have entered into force. Those in force call for the reduction of emissions and transboundary fluxes of sulphur dioxide (SO₂ or 'sulphur'), nitrogen oxides (NO_x) and volatile organic compounds (VOCs). The three recent protocols not yet in force call for control of emissions of heavy metals and

persistent organic pollutants (POPs), and of ammonia (NH₃), NO_x, VOCs and sulphur that promote acidification, eutrophication and ground-level ozone. 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 in assessing the state of air pollution in the UNECE region and in 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 4 November 2003, asking the European Community to report its 2002 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 only covers the EU Member States before 1 May 2004 (EU15) because the formal reporting deadline to the LRTAP Convention was 15 February 2004. 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

Convention/Protocol	Status
Convention on long-range transboundary air pollution	Signed and ratified
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
Protocol on the reduction of sulphur emissions or their transboundary fluxes by at least 30 percent	
Protocol concerning the control of emissions of nitrogen oxides or their transboundary fluxes	Ratified
Protocol concerning the control of emissions of volatile organic compounds or their transboundary fluxes	Signed
Protocol on further reduction of sulphur emissions	Signed and ratified
Protocol on persistent organic pollutants	Signed
Protocol on heavy metals	Signed and ratified
Protocol to abate acidification, eutrophication and ground-level ozone	Ratified

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
CLRTAP	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
None	Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants	Emission of SO ₂ , NO _x , NMVOCs, NH ₃	31 December	None
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	31 December (to the European Commission) 14 April (to the UNFCCC)	15 April

Throughout this report, the European Community refers to the 15 Member States up to 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 for the European Community remains the 1979 LRTAP Convention. Within the European Community, the Member States are requested to post a copy of their official submission to CLRTAP on their European environmental information system (Eionet¹) servers (web sites) or on a named web site by 15 February of each year. EEA/ETC-ACC collects the data from these web sites and compiles the European Community CLRTAP 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 pollutants², 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. This year, the EEA/ETC-ACC presents the data availability for a possible NEC inventory.

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 CLRTAP inventory involves the 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.

⁽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 entered into force in March 2004. The compilation of the inventories for 2004 took place under the previous Council Decision 99/296/EC.

1.3. General description of methods and data sources used

The European Community CLRTAP inventory is the sum of the Member States' inventories. The methods of

the Member States are based on the joint EMEP/CORINAIR (Air emissions inventory of the European Environment Agency) guidebook⁴. For the 2004 inventory, 14 out of 15 Member States provided CLRTAP/NEC data. Table 3

Table 3 Date of receipt by EEA, years covered and NFR tables available from Member States by 10 May 2004

Member State	Submission	Submission date	Latest data available	Years covered	Gases covered	Format emissions
Austria	NEC	30 Dec 2003	2002	1990–2002	SO _x , NO _x , VOC, NH ₃	New NFR (Table 1A)
Austria	CLRTAP	15 Mar 2004	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR
Belgium	NEC	14 Jan 2004	2002	2001–2002	SO _x , NO _x , VOC, NH ₃	New NFR (Table 1A)
Belgium	NEC Report	5 Feb 2004				
Denmark	CLRTAP	12 Feb 2004	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR
Denmark	NEC	22 Mar 2004	2002	1980–2002	SO _x , NO _x , VOC, NH ₃	detailed NFR
Finland	NEC	12 Dec 2003	2001	2000–2001	SO _x , NO _x , VOC, NH ₃	Old NFR
Finland	CLRTAP	19 Dec 2003	2001	2001	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR
Finland	CLRTAP	12 Feb 2004	2002	2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR (Table 1A, 1B)
Finland	CLRTAP	1 Mar 2004	2002	2002	SO ₅ , NO _x , VOC, NH ₃ , CO, PM, HM	New NFR (Table 1A, grid)
France	NEC	15 Jan 2004	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR (Table 1A, 1B)
France	CLRTAP/NEC	4 May 2004 (earlier to COM)	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR
Germany	CLRTAP	15 Feb 2004	2002	1990–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM	New NFR
Germany	CLRTAP	22 Mar 2004	2002	1990–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, POP	New NFR
Germany	CLRTAP	30 Apr 2004	2002	1990–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, POP	New NFR
Greece	NEC	5 Jan 2004	2001	1990–2001	SO _x , NO _x , VOC, NH ₃	SNAP
Greece	CLRTAP	17 Feb 2004	2002	2001–2002	SO _x , NO _x , VOC, CO	New NFR (Table 1A, 2A)
Ireland	NEC	31 Dec 2003	2002	2001–2002	SO _x , NO _x , VOC, NH ₃ , CO	New NFR (Table 1A)
Ireland	CLRTAP	16 Feb 2004	2002	2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR (Table 1A, 1B)
Ireland	NEC	16 Feb 2004	2002	2001–2002	SO _x , NO _x , VOC, NH ₃ , CO	New NFR (Table 1A)
Luxembourg	NEC	30 Jan 2004				
Netherlands	NEC	19 Dec 2003	2002	2001–2002	SO _x , NO _x , VOC, NH ₃	New NFR (Table 1A, 2A)
Portugal	CLRTAP	23 Feb 2004	2002	1990–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM	New NFR
Spain	NEC	10 May 2004 (earlier to COM)	2002	2000–2002	NO _x , NMVOC, SO _x , NH ₃	New NFR (Table 1A)
Sweden	NEC	15 Dec 2003	2002	1988–2002	SO _x , NO _x , VOC, NH ₃	New NFR (Table 1A, 2A)
Sweden	CLRTAP	13 Feb 2004	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR
United Kingdom	CLRTAP	13 Feb 2004	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, PM, HM, POP	New NFR
Additional submissions, received after 10 May 2004 (not included in this inventory):						
Italy	CLRTAP	12 May 2004 (earlier to COM)	2002	1980–2002	SO _x , NO _x , VOC, NH ₃ , CO, HM	SNAP level 2

(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>

provides an overview of available emission data submissions at the EEA by 10 May 2004.

Background information on the inventories was obtained in the national inventory reports (NIR), NEC reports and national programmes for the implementation of the NEC Directive. Table 4 provides an overview of available inventory reports, NEC national programmes and NEC reports at the European Environment Agency by 10 May 2004.

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. 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.

Some 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.

Only two Member States reported on their QA/QC plans in their inventory reports and therefore it is not evaluated how these QA/QC activities influenced the quality of the EC inventory (see Table 5).

Table 4 Date of receipt by EEA, national inventory reports, NEC national programmes and NEC reports available from Member States by 10 May 2004

Member State	Scenarios/ National programmes	Inventory	Background data emissions	Format projections	Background data projections
Austria		1980–2002	Yes		
Belgium	Yes	2001–2002			
Denmark		1980–2002	Yes	Totals	Table 2b+2c
Denmark	Yes	1980–2002			
Finland		2000–2001		Totals	Primary energy consumption by fuel
Finland		2001		Totals	
France	Yes	1980–2002	Yes	Totals	Table 2b, 2c, 2d, 2e
Germany		1990–2002	Yes		Table 2d
Greece		1990–2001		Totals	
Greece		2001–2002		Totals	
Ireland	Yes	2001–2002			
Luxembourg	Yes				
Netherlands		2001–2002		Detailed NFR	
Portugal		1990–2002	Yes		
Sweden		1988–2001		Totals	
Sweden	Yes	1980–2002	Yes	Totals	
United Kingdom		1980–2002		Totals	

1.5. Uncertainty evaluation

The uncertainties of the inventory 2004 were not estimated.

1.6. General assessment of the completeness

Due to data gaps and due to lack of an agreed data gap filling procedure, total European Community emissions can be estimated only for NO_x, CO, NMVOCs, SO_x and NH₃.

1.6.1. Data gaps and gap filling

For Member States which did not provide data, the emissions of air pollutants reported by the European Community and its Member States under the UNFCCC were used.

Table 6 shows for which Member States 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).

Table 5 Quality assurance and quality control activities reported by the Member States

Member State	QA/QC activities reported by the Member States	Source
Finland	The quality management system for the air pollutant inventory is currently under development and will be implemented in the inventory for 2002 emissions. Documentation of the calculation methods used in the year 2001 emissions was carried out in 2002–2003. The annually reported NFR tables are archived at the Finnish Environment Institute. The method descriptions together with documents of the original data sources are archived at the Finnish Environment Institute. Inter-comparison with greenhouse gas emission inventory data: Statistics Finland calculates the greenhouse gas emission data from fuel combustion processes that are reported to the UNFCCC Secretariat and the European Union Commission. Inter-comparison between the Finnish Environment Institute and Statistics Finland is carried out with data related to the fuel combustion process source categories in the inventory systems at the two institutes, at the aggregation level allowed for statistical confidentiality. Necessary corrections are made to both of the inventories according to the results of the inter-comparison. The present inventory of the year 2001 emissions is not verified by a third party.	NIR 04, p.8
Sweden	Sweden is currently developing quality assurance procedures. These procedures are planned to be fully implemented in 2005 at the earliest. In this inventory, most general Tier 1 QC measures in the Good Practice Guidance (Table 8.1 in the GPG) have been conducted. In this submission, a web application has been connected to the temporary database (described in Chapter 1.3.2) to facilitate the quality control work. In the application, it is possible to see time series for all sectoral and sub-sectoral emissions, as well as percentage changes of reported emissions compared to reported emissions in the last submission. The web application has been an efficient tool to discover errors.	NIR 04, p. 7–8

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 under EIONET and/or NEC	CRF as used in EEA (2004)
Austria	1990–2002	
Belgium	2001–2002 (NO _x , NMVOC, SO ₂)	1990–2000 (CO: 1990–2002)
Denmark	1990–2002	
Finland	2001–2002	1990–2000
France	1990–2002	
Germany	1990–2002	
Greece	2001–2002	1990–2000
Ireland	2001–2002	1990–2000
Italy		1990–2002
Luxembourg		1990–2002
Netherlands	1990, 1995, 1998–2002	1991–1994, 1996–1997
Portugal	1990–2002	
Spain	2000–2002 (NO _x , NMVOC, SO ₂)	1990–1999 (CO: 1990–2002)
Sweden	1990–2002	
United Kingdom	1990–2002	

Although the new NFR and the CRF are now widely compatible, a few adaptations had to be made in order to use the new NFR together with the CRF (for those Member States which did not provide data in the new NFR). The adaptations were necessary due to the following reasons:

- (1) The CRF data from EEA (2004) are not available for all Member States at the level of detail required under the new NFR. The level of detail available for all Member States is the category split of CRF Table Summary 1.A. Therefore, for those Member States which provided the new NFR, sub-sector totals (e.g. 1.A.3.) had to be calculated in order to be compatible with the more aggregate CRF data.
- (2) The new NFR does not allow for reporting of all sub-sector totals. Therefore, an additional table is provided, in order to make transparent the calculation of EC emissions at total level. This additional table is provided for each year in a separate sheet to NFR Table IV 1A.
 - Geographical coverage: French emissions reported to UNECE/CLRTAP do not include emissions from overseas departments and territories, whereas the French submissions to the UNFCCC do include these emissions.
 - Reporting of NMVOC emissions from 5E: under UNECE/CLRTAP, emissions from 5E are not included in the national total, but reported as a memo item; under UNFCCC, these emissions are included in the national total.

1.6.2. 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).

Annex B provides the status reports for each Member State.

Annex C provides the Tables IV 1A for the years 1990–2002 for the European Community. Because of lack of data and lack of a data gap filling procedure, emissions can be provided for only a limited numbers of years and gases.

2. European Community air pollution trends

2.1. Emission trends by gas

Figure 1 and Table 7 show the EC emission trends for NO_x, CO, NMVOCs, SO_x between 1990 and 2002. NH₃ is shown for 1990 and 1995–2000. The greatest reductions in absolute terms were in CO emissions (22191 Gg),

followed by SO_x (10803 Gg), NMVOC (6251 Gg) and NO_x (4093 Gg). The NH₃ emissions remained nearly stable (a reduction of 380 Gg) between 1990 and 2000.

Figure 1 European Community emission trends for NO_x, CO, NMVOCs, SO_x between 1990 and 2002, and for NH₃ in 1990 and 1995–2000

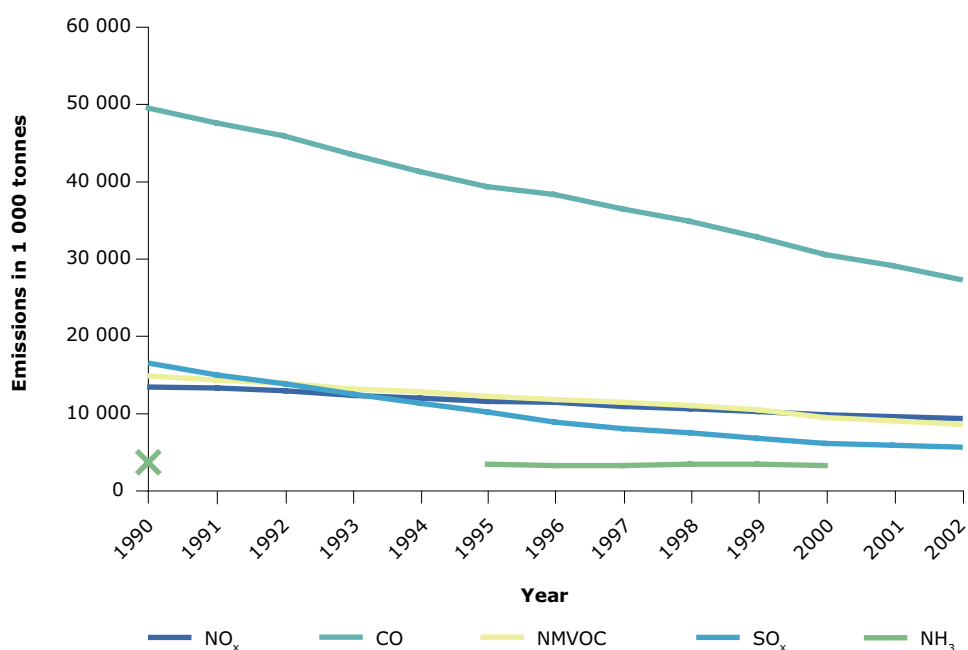


Table 7 Total European Community emissions of NO_x, CO, NMVOCs, SO_x and NH₃ in Gg

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
NO _x	13 449	13 303	12 993	12 371	12 019	11 595	11 446	10 959	10 662	10 292	9 833	9 599	9 356
CO	49 561	47 652	45 977	43 544	41 342	39 399	38 348	36 516	34 903	32 859	30 584	29 176	27 370
NMVOC	14 854	14 364	13 951	13 227	12 833	12 260	11 836	11 466	11 067	10 522	9 511	9 061	8 603
SO _x	16 507	14 992	13 853	12 579	11 364	10 203	8 912	8 070	7 553	6 819	6 127	5 899	5 704
NH ₃	3 696	NE	NE	NE	NE	3 438	3 261	3 276	3 475	3 475	3 316	NE	NE

3. Future improvements of the inventory

The inventory suffers mostly from the lack of data that prohibits the compilation of a more detailed inventory at the European Community level. The compilation procedure itself does not have any detailed QA/QC plan, and no proper uncertainty estimation has been developed. It is essential for the inventory preparation that a formal QA/QC plan would be developed.

Also, an uncertainty estimation should assess the quality of the reported data to identify areas of further improvement. To be able to recognise the weaknesses of the European Community inventory, a discussion on the qualitative level at least should be provided in the future. Likely causes of uncertainty, potential reasons for biases and random errors could be discussed and the degree of quality (e.g. high, good, fair or poor) could be provided.

The European Community CLRTAP inventory 2003 was subject to a trial review by the EEA/ETC-ACC and the EMEP. The review tested the timeliness, consistency, accuracy, completeness and comparability of the European Community submission. The review did not provide any concrete suggestions for improvement as it concentrated more on the individual Member States'

submissions than on the aggregate emissions of the European Community.

The EEA/ETC-ACC have noted that the main future challenge for the European Community is to improve the data reporting procedures, in order to obtain more complete and timely UNECE/CLRTAP emission inventories at European Community level. The improvements cannot take place only at the EC level but should also involve the development of inventory systems in the Member States.

Possibilities for further streamlining and harmonisation of emission reporting, especially with the UNFCCC and the European Community greenhouse gas monitoring mechanism, should be explored. The final goal of emission reporting within the European Community will be a system at national and European Community level for the main international reporting requirements (UNECE/CLRTAP and UNFCCC). In addition, the further implementation of Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants is expected to contribute to improving the timeliness and quality of the European Community CLRTAP inventory.

4.2. Data basis of the European Community NEC inventory

Table 9 shows that an NEC inventory based on new NFR format is not possible with the current data (some countries submitted NEC inventories in old NFR format, see Table 3). Therefore, this inventory is based on CLRTAP inventory submissions, NEC submissions, and by gap filling with the UNFCCC submissions.

4.3. Member State projections

Seven Member States provided data on projections in their submissions (listed in Table 4). The projections for 2010 for national totals in Gg are summarised in Table 10. Based on these projections, it is not possible to determine a projection for the EC total.

Table 10 Reported projections for 2010

Member State	SO _x (as SO ₂)	NO _x (as NO ₂)	NH ₃	NMVOG
Denmark	56	146.4	82.8	83
Finland	97.5	151	31	130
France	387	988	857	954
Greece	< 300	344	73	261
Netherlands	70	289	127	220
Sweden	67	148	57	241
United Kingdom	585	1 167	297	1 200

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
CLRTAP	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
NECD	national emission ceilings directive
NFR	nomenclature for reporting
NH ₃	ammonia
NMVOG	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

European Environment Agency

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