

Annual European Community CLRTAP emission inventory 1990–99

**Submission to the Executive Body of the UNECE
Convention on Long-range Transboundary Air Pollution**

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Printed in Denmark

Printed on recycled and chlorine-free bleached paper

ISBN: 92-9167-415-X

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1. Reporting by the European Community

This report was prepared by the European Commission on behalf of the European Community (EC) in fulfilment of its obligations as a party to the Convention on Long-range Transboundary Air Pollution (CLRTAP). It is submitted to the Environment and Human Settlements Division of the United Nations Economic Commission for Europe (UNECE) in its function as the Secretariat for the Executive Body of the Convention. The UNECE requests parties to report their 1999 emission data on SO_x (as SO₂), NO_x (as NO₂), NH₃, NMVOCs, CO, heavy metals (HMs), and persistent organic pollutants (POPs) and for CO₂ and CH₄ the same data as reported under the United Nations Framework Convention on Climate Change (UNFCCC).

The European Community is a party to the CLRTAP and is furthermore a party to the 1988 NO_x Protocol, and the 1994 Protocol on Further Reduction of Sulphur Emissions. In addition, the European Community has signed, but not yet ratified, the 1991 Protocol on Volatile Organic Compounds, the 1998 Heavy Metals Protocol, and the 1998 Protocol on Persistent Organic Pollutants. The EC has not yet signed the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone.

Apart from the European Community, all of its Member States are individual parties to CLRTAP. The Member States of the European Union and the European Communities are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. The Member States also report their emission data directly to the UNECE.

The EC CLRTAP emission inventory is based on data that EC Member States submit to the European Commission and the EEA in the framework of the European Environmental Information and Observation Network (EIONET). The EIONET is an extended network consisting of the EEA as the 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. The main aim of the EIONET is to collect and provide objective, reliable and comparable information on the environment at European level. The EEA assists the Commission in the compilation of the annual EC CLRTAP inventory, based on the Member States' data, through the work of its European Topic Centre on Air and Climate Change (ETC/ACC) within the EIONET framework.

This report presents air emission inventories for the European Community as a whole (EU-15) for 1990–99 (and 1980 to 1990 where available). It contains data on CO₂, CH₄, SO_x (as SO₂), NO_x (as NO₂), NH₃, NMVOCs, and CO. Since the data have been revised and updated, this submission replaces any previous EC inventory data submitted to the UNECE/CLRTAP.

2. Methodology and data basis of the EC inventory

Methodology and use of the EIONET

The EC inventory is based on the data provided by the EC Member States within the EIONET framework. The legal basis of the EIONET is Council Regulation (EC) No 933/1999 of 29 April 1999 ⁽¹⁾ amending Regulation (EEC) No 1210/90 on the establishment of the European Environment Agency and the European Environmental Information and Observation Network (EIONET).

Several priority data flows have been agreed within the EIONET to provide complete, consistent, comparable, transparent, accurate and timely data sets needed for effective and efficient framing, implementation, monitoring and evaluation of environmental policies at EU and Member State level. In addition, these data sets are needed to fulfil the international reporting requirements of the European Community. In order for the EEA and ETC/ACC to prepare the EC CLRTAP submission, EC Member States are requested to post a copy of their official submission to the CLRTAP on their EIONET servers (web sites) or on a named web site. The ETC/ACC collects the data from these web sites and compiles the EC CLRTAP inventory database.

Although the European Community fully recognises the reporting obligations under the CLRTAP, reporting complete EC inventories has been difficult. The main reasons for this are that:

- the EC inventory relies on the availability and submission of Member States' data;
- there is no officially agreed data gap procedure within the EC that can be applied to those Member States that reported incomplete or no emission data for a certain year.

Complete EC inventories can therefore only be provided for a limited number of air pollutants and years (see Annexes A, B and C).

However, in order to provide a more complete picture, the emissions of air pollutants reported by the EC and its Member States under the UNFCCC (SO_x, NO_x, CO and NMVOCs) have been used (see the latest EC submission to the UNFCCC as compiled by the EEA and ETC/ACC *Annual European Community greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001). The advantage of using the EC inventory to the UNFCCC is that the data availability is better and that an officially agreed data gap procedure is defined in the guidelines to the EC greenhouse gas monitoring mechanism (Council Decision 1999/296/EC). Furthermore, for CO₂ and CH₄ emissions, the UNECE/CLRTAP request is for the same data as reported under the UNFCCC.

Therefore, in summary, the data basis for this report is as follows.

For **NH₃, heavy metals (HMs), and persistent organic pollutants (POPs)**, all EIONET submissions of the Member States have been used. Because of lack of data and lack of a data gap procedure, EU totals can only be provided for NH₃ for the years 1990, 1995 and 1997 (see Annexes A and B).

For **CO₂, CH₄, SO_x, NO_x, CO, and NMVOCs**, data as compiled for the inventory submission by the European Community to the UNFCCC have been used (see Annex B).

(1) OJ L 117, 5.5.1999, p. 1.

Future improvements of the EC CLRTAP inventory

A main future challenge for the European Community is to improve the data reporting procedures in place, in order to obtain more complete and timelier UNECE/CLRTAP emission inventories at EU level. For this purpose, the possibilities of further streamlining and harmonisation of emission reporting especially with the UNFCCC and the EC greenhouse gas monitoring mechanism should be explored. The final goal of emission reporting within the European Community should be to have one system at national and EU level for both main international reporting requirements (UNECE/CLRTAP and UNFCCC).

Therefore, EC Member States and the Commission will investigate how to make use of the experiences gained over the past years within the EC greenhouse gas monitoring mechanism. The monitoring mechanism has been very successful in improving the timeliness and completeness of Member States' greenhouse gas submissions. In addition, the possible use of the foreseen EU 'greenhouse gas inventory system' required under the Kyoto Protocol will be investigated. Furthermore, the adoption and implementation of Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants ⁽²⁾ is also expected to contribute to improvement in the timeliness and quality of the EC CLRTAP inventory.

(2) OJ L 309, 27.11.2001, p. 22.

3. Reporting format and data provided

Reporting format

The report follows the draft reporting procedures described in document EB.AIR/GE.1/1997/5 and the UNECE Environment and Human Settlements Division's letter of 17 November 2000 requesting the submission of 1999 emission data by the parties to the CLRTAP.

As required under the UNECE/CLRTAP reporting procedures, for CO₂ and CH₄ the same data as reported under the United Nations Framework Convention on Climate Change are presented, following the UNFCCC reporting guidelines (common reporting format) (FCCC/CP/1999/7) and the Intergovernmental Panel on Climate Change (IPCC) 1996 guidelines for national greenhouse gas inventories (UNFCCC Summary Table 1.A which corresponds to IPCC Table 7A).

This year, also emissions of SO_x, NO_x, CO and NMVOCs are reported in the UNFCCC/IPCC format because of improved data availability (see Chapter 2) and the new reporting format approved by the EMEP Steering Body (EB.AIR/GE.1/2001/6). These new guidelines aim for consistency with the category split of the IPCC sectoral tables as applied by the UNFCCC.

Overview of data provided in the annexes

Annex A provides an overview of the completeness of data made available to the EEA by EC Member States by 1 December 2001 (for NH₃, HMs and POPs).

Annex B includes summary tables for EC emissions for the period 1990–99 for the pollutants SO₂, NO_x, NH₃, NMVOCs, CO, CH₄ and CO₂. The EC totals for HMs and POPs could not be prepared for any year due to incomplete national data reporting (see Annex A).

Annex C constitutes a note sent to the Executive Body of the UNECE Convention on Long-range Transboundary Air Pollution in response to the fourth report of the Implementation Committee of the UNECE/CLRTAP (EB.AIR/2001/3) and the fact that the EC is a party to the 1988 NO_x Protocol. The note covers data on NO_x emissions 1987–89.

Annex A: Availability of air emission data for the EC submission to the UNECE as of 1 December 2001

Completeness of data made available to the EEA by EC Member States by 1 December 2001 (for NH₃, HMs and POPs).

Explanation for Member States' data availability:

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
- submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of NH₃

Table A.1.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
EU-15											√					√		√				
Austria	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Belgium						•					•	•	•	•	•	•	•	•	•			
Denmark						√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
Finland							•				•					•		•	•	√	•	•
France	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√
Germany	•	•	•	•	•	•	•	√	√	√	√	√	√	√	√	√	√	√	√	√		
Greece											•	•	•	•	•	•	•	•	•			•
Ireland											•	•	•	•	•	•	•	•	•			
Italy	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	√	√	√	√	
Luxembourg											•				•	•	•	•	•	√		•
Netherlands	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Portugal											√	√	√	√	√	√	√	√	√			
Spain	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√			
Sweden								√			√	√	√	√	√	√	√	√	√	√	√	√
United Kingdom											•	•	•	•	•	•	•	•	•			

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
- submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.2.

EIONET data availability of Pb, Cd and Hg

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
EU-15	Lead (Pb)										
	Cadmium (Cd)										
	Mercury (Hg)										
Austria		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	√	√	√	√	√	√	√	√	√	√
	Cadmium (Cd)	√	√	√	√	√	√	√	√	√	√
Belgium		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	•	•	•	•	•	•	•	•		
	Cadmium (Cd)	•	•	•	•	•	•	•	•		
Denmark		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	√				•	•	•	√	√	√
	Cadmium (Cd)	√				•	•	•	√	√	√
Finland		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	•	•	•	•	•	•	•	•	•	√
	Cadmium (Cd)	•	•	•	•	•	•	•	•	•	√
France		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	√	√	√	√	√	√	√	√	√	√
	Cadmium (Cd)	√	√	√	√	√	√	√	√	√	√
Germany		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	•					•				
	Cadmium (Cd)	•					•				
Greece		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)							•			
	Cadmium (Cd)							•			
Ireland		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)										
	Cadmium (Cd)										
Italy		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)										
	Cadmium (Cd)										
Luxembourg		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	•				•	•	•	•	•	√
	Cadmium (Cd)	•				•	•	•	•	•	√
Netherlands		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	√	√	√	√	√	√	√	√	√	√
	Cadmium (Cd)	√	√	√	√	√	√	√	√	√	√
Portugal		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)										
	Cadmium (Cd)										
Spain		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	√	√	√	√	√	√	√	√	√	
	Cadmium (Cd)	√	√	√	√	√	√	√	√	√	
Sweden		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	√		√		√	√				
	Cadmium (Cd)	√		√		√	√				
United Kingdom		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	•	•	•	•	•	•	•	•	•	
	Cadmium (Cd)	•	•	•	•	•	•	•	•	•	
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Lead (Pb)	•	•	•	•	•	•	•	•	•	
	Cadmium (Cd)	•	•	•	•	•	•	•	•	•	

√ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.

• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — EU-15

Table A.3.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans										
Polyaromatic hydrocarbons (PAHs)										
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

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 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — Austria

Table A.4.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans	√	√	√	√	√	√	√	√	√	√
Polyaromatic hydrocarbons (PAHs)	√	√	√	√	√	√	√	√	√	√
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.5. EIONET data availability of POPs — Belgium

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans	•				•	•	•	•		
Polyaromatic hydrocarbons (PAHs)	•			•	•	•	•	•		
Hexachlorobenzene (HCB) (CAS: 118-74-1)	•				•	•	•			
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)	•					•	•			
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.6. EIONET data availability of POPs — Denmark

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)					•					
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans								•		√
Polyaromatic hydrocarbons (PAHs)					√	√	√	√	√	√
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)					•					

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — Finland

Table A.7.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)				•	•	•				
ANNEX III										
Dioxins and furans	√	√	√	√	√	√	√	√	√	√
Polyaromatic hydrocarbons (PAHs)	√	√	√	√	√	√	√	√	√	√
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
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EIONET data availability of POPs — France

Table A.8.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)	√	√	√	√	√	√	√	√	√	√
ANNEX III										
Dioxins and furans	√	√	√	√	√	√	√	√	√	√
Polyaromatic hydrocarbons (PAHs)	√	√	√	√	√	√	√	√	√	√
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)	√	√	√	√	√	√	√	√	√	√

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.9. EIONET data availability of POPs — Germany

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)					√					
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)	√				√					
ANNEX III										
Dioxins and furans	√					√				
Polyaromatic hydrocarbons (PAHs)	√				√					
Hexachlorobenzene (HCB) (CAS: 118-74-1)	√									
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)					√					
Short-chained chlorinated paraffins (CAS: 85535-84-8)					√					

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.10. EIONET data availability of POPs — Greece

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans										
Polyaromatic hydrocarbons (PAHs)										
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — Ireland

Table A.11.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans										
Polyaromatic hydrocarbons (PAHs)										
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — Italy

Table A.12.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans										
Polyaromatic hydrocarbons (PAHs)										
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.13. EIONET data availability of POPs — Luxembourg

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans	•				•	•	•	•	•	√
Polycyclic aromatic hydrocarbons (PAHs)					•	•	•	•	•	√
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.14. EIONET data availability of POPs — Netherlands

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)	√		√		√	√				
Chlordane (CAS: 57-74-9)	√		√		√	√				
Chlordecone (CAS: 143-50-0)	√		√		√	√				
Dieldrin (CAS: 60-57-1)	√		√		√	√				
Endrin (CAS: 72-20-8)	√		√		√	√				
Heptachlor (CAS: 76-44-8)	√		√		√	√				
Hexabromobiphenyl (CAS: 36355-01-8)	√		√		√	√				
Mirex (CAS: 2385-85-5)	√		√		√	√				
Toxaphene (CAS: 8001-35-2)	√		√		√	√				
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)	√		√		√	√	√	√		
DDT (CAS: 50-29-3)	√		√		√	√				
Polychlorinated biphenyls (PCBs)	√		√		√	√				
ANNEX III										
Dioxins and furans	√		√		√	√	√	√	√	√
Polycyclic aromatic hydrocarbons (PAHs)	√		√		√	√	√	√	√	√
Hexachlorobenzene (HCB) (CAS: 118-74-1)	√		√		√	√	√	√	√	√
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)	√		√		√	√	√	√	√	√
Short-chained chlorinated paraffins (CAS: 85535-84-8)	√				√	√	√	√	√	√

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — Portugal

Table A.15.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans										
Polyaromatic hydrocarbons (PAHs)										
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

EIONET data availability of POPs — Spain

Table A.16.

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans	√	√	√	√	√	√	√	√	√	
Polyaromatic hydrocarbons (PAHs)	√	√	√	√	√	√	√	√	√	
Hexachlorobenzene (HCB) (CAS: 118-74-1)	√	√	√	√	√	√	√	√	√	
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)	√	√	√	√	√	√	√	√	√	
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
 • submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.17. EIONET data availability of POPs — Sweden

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)										
ANNEX III										
Dioxins and furans	√			√						
Polyaromatic hydrocarbons (PAHs)	√		√			√				
Hexachlorobenzene (HCB) (CAS: 118-74-1)										
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Table A.18. EIONET data availability of POPs — United Kingdom

ANNEX I	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)	•	•	•	•	•	•	•	•	•	
DDT (CAS: 50-29-3)										
Polychlorinated biphenyls (PCBs)	•	•	•	•	•	•	•	•	•	
ANNEX III										
Dioxins and furans	•	•	•	•	•	•	•	•	•	
Polyaromatic hydrocarbons (PAHs)	•	•	•	•	•	•	•	•	•	
Hexachlorobenzene (HCB) (CAS: 118-74-1)	•	•	•	•	•	•	•	•	•	
OTHER										
Pentachlorophenol (PCP) (CAS: 87-86-5)	•	•	•	•	•	•	•	•	•	
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

- √ submitted for UNECE 2001 inventory (due 31 December 2000) with copy to the EEA.
• submitted for UNECE 2000 inventory (due 31 December 1999) with copy to the EEA.

Annex B: European Community CLRTAP emission data

Summary tables for EC emissions for the period 1980–99 for the pollutants SO₂, NO_x, NH₃, NMVOCs, CO, CH₄, CO₂, HMs and POPs

Anthropogenic annual emissions of SO₂, NO_x, NH₃, NMVOCs, CO, CH₄ and CO₂ 1980–99

Party: European Community; Sector: All sectors																	Table B.1			
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
SO _x (as SO ₂)											16325	14801	13590	12351	11198	10138	8840	7969	7549	6803
NO _x (as NO ₂)											13292	13195	12882	12246	11872	11509	11326	10872	10499	10136
NH ₃											3795					3517		3598		
NMVOG											16633	16071	15549	14865	14745	14313	13831	13232	12398	12004
CO											49817	47964	46046	43746	41862	40513	39231	37470	35497	33602
CH ₄											20955	20444	19895	19353	18842	18782	18446	18051	17636	17445
CO ₂											3325	3351	3277	3208	3221	3258	3333	3272	3317	3271

Notes: SO₂, NO₂, NMVOCs, NH₃, CO and CH₄ in 1 000 tonnes per year; CO₂ in million tonnes per year.
For SO₂, NO₂, NMVOCs, CO, CH₄ and CO₂, data have been used from the 2001 submission of the European Community to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001.

Anthropogenic annual emissions of CO₂, CH₄, NO_x, CO, NMVOCs and SO₂ 1990–99

SUMMARY 1.A: SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)

Table B.2.

EU-15 1990

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NMVOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,325,370	-199,850	20,955	1,272	-	25,627	-	13,502	-	0.3	13,292	49,817	16,633	16,325
1. Energy	3,159,538		4,832	154							13,019	44,805	8,760	15,905
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,133,575		811	153							12,988	44,624	7,405	15,429
1. Energy Industries	1,147,030		34	46							2,880	480	58	10,114
2. Manufacturing Industries and Construction	638,446		57	31							1,707	3,544	142	2,865
3. Transport	697,683		216	39							6,972	32,210	6,097	677
4. Other Sectors	630,585		501	36							1,334	8,248	1,081	1,522
5. Other	19,832		2	0							96	142	26	251
B. Fugitive Emissions from Fuels	25,963		4,021	1							31	181	1,355	476
1. Solid Fuels	6,762		2,417	0							1	96	11	163
2. Oil and Natural Gas	19,201		1,604	1							30	85	1,345	314
2. Industrial Processes	149,000		22	356	-	25,627	-	13,502	-	0.3	180	3,544	966	395
A. Mineral Products	108,070		0	0							43	28	210	44
B. Chemical Industry	11,874		10	356	-	2,340	-	70	-	0.0	83	124	379	153
C. Metal Production	25,137		8	0							25	3,226	20	92
D. Other Production	980										16	13	226	71
E. Production of Halocarbons and SF ₆						22,576		560		0.0				
F. Consumption of Halocarbons and SF ₆					-	360	-	856	-	0.3				
G. Other	2,939		4	0	-	351	-	237	-	0.0	14	154	132	35
3. Solvent and Other Product Use	5,997			11							0	2	4,303	0
4. Agriculture	3,215	0	9,077	715							37	519	939	1
A. Enteric Fermentation			6,748											
B. Manure Management			2,010	89									1	
C. Rice Cultivation			109	1									0	
D. Agricultural Soils	3,215	0	184	625							17		867	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			25	1							21	519	72	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-199,850	122	19							8	209	1,561	1
A. Changes in Forest and Other Woody Biomass Stocks		-240,229												
B. Forest and Grassland Conversion	13,377		24	0							6	209	19	1
C. Abandonment of Managed Lands	-	-122												
D. CO ₂ Emissions and Removals from Soil	24,315	-												
E. Other	2,808	-	98	19							2	0	1,542	0
6. Waste	5,544		6,901	14							47	738	102	22
A. Solid Waste Disposal on Land	263		6,478	0							1	41	37	1
B. Wastewater Handling			302	12							0	0	5	
C. Waste Incineration	5,170		40	2							46	696	45	21
D. Other	111		80	0							0	1	16	0
7. Other	2,076	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	163,869		9	4							1,482	276	181	955
Aviation	60,073		5	2							224	160	59	15
Marine	103,796		5	3							1,258	116	122	940
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	129,961													

Note:

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001.

EU-15 1991

Table B.3.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,350,679	-221,908	20,444	1,264	-	24,954	-	11,847	-	0.4	13,195	47,964	16,071	14,801
1. Energy	3,193,327		4,739	160							12,931	43,355	8,421	14,447
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,169,569		806	159							12,902	43,185	7,104	14,141
1. Energy Industries	1,151,292		38	48							2,788	471	61	9,534
2. Manufacturing Industries and Construction	616,580		51	30							1,700	3,419	140	2,513
3. Transport	712,095		205	44							6,973	31,148	5,805	651
4. Other Sectors	673,718		510	37							1,355	8,049	1,083	1,241
5. Other	15,885		1	1							86	98	15	202
B. Fugitive Emissions from Fuels	23,758		3,933	1							29	170	1,317	306
1. Solid Fuels	6,056		2,310	0							1	99	10	17
2. Oil and Natural Gas	17,702		1,623	1							28	71	1,307	289
2. Industrial Processes	140,982		21	350	-	24,954	-	11,847	-	0.4	165	3,049	968	329
A. Mineral Products	103,300		0	0							44	29	244	45
B. Chemical Industry	11,148		10	350	-	2,340	-	70	-	0.0	68	117	360	133
C. Metal Production	23,042		7	0				10,189		0.1	24	2,763	19	84
D. Other Production	554										16	13	222	37
E. Production of Halocarbons and SF ₆						21,875		479		0.0				
F. Consumption of Halocarbons and SF ₆					-	384	-	878	-	0.3				
G. Other	2,938		4	0	-	355	-	231	-	0.0	14	128	123	31
3. Solvent and Other Product Use	5,974			11							0	2	4,170	0
4. Agriculture	2,815	0	8,812	706							38	537	883	1
A. Enteric Fermentation			6,562											
B. Manure Management			1,933	88									1	
C. Rice Cultivation			107	1									0	
D. Agricultural Soils	2,815	0	185	616							16		815	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			26	1							21	537	67	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-221,908	113	19							6	124	1,517	0
A. Changes in Forest and Other Woody Biomass Stocks	-	-264,846												
B. Forest and Grassland Conversion	11,604		14	0							4	124	14	
C. Abandonment of Managed Lands	-	-162												
D. CO ₂ Emissions and Removals from Soil	28,713	-												
E. Other	2,783	-	98	19							2	0	1,504	0
6. Waste	5,548		6,757	14							55	896	113	23
A. Solid Waste Disposal on Land	321		6,346								1	45	39	1
B. Wastewater Handling			281	12							0	0	5	
C. Waste Incineration	5,227		47	2							54	850	51	22
D. Other	0		83	0							0	1	18	0
7. Other	2,033	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	163,947		9	5							1,432	264	180	914
Aviation	59,649		5	1							207	157	58	16
Marine	104,298		4	3							1,225	107	122	898
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	136,993													

Notes:

In order to obtain a complete EC inventory, for Luxembourg the following data gap filling procedure was used: Emissions reported for 1990 were taken as first estimates. However, for CO₂ emissions from fossil fuel combustion (CRF category 1 'Energy'), the 1990 estimates in combination with trend information for 1991 from latest calculations of CO₂ emissions from fossil fuels by Eurostat have been used (Eurostat, 2000).

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990-99*, EEA Technical report No 60, April 2001.

Table B.4.

EU-15 1992

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,277,471	-209,145	19,895	1,234	-	24,957	-	9,606	-	0.4	12,882	46,046	15,549	13,590
1. Energy	3,124,449		4,621	162							12,637	41,669	8,209	13,274
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,100,933		759	161							12,608	41,515	6,923	12,975
1. Energy Industries	1,115,762		38	48							2,617	425	55	8,814
2. Manufacturing Industries and Construction	593,245		51	30							1,618	3,337	140	2,309
3. Transport	736,492		202	48							6,989	30,220	5,683	636
4. Other Sectors	643,356		467	35							1,305	7,440	1,031	1,024
5. Other	12,078		1	1							80	92	14	192
B. Fugitive Emissions from Fuels	23,516		3,863	1							28	154	1,286	300
1. Solid Fuels	5,880		2,238	0							1	93	8	14
2. Oil and Natural Gas	17,635		1,625	1							28	61	1,278	286
2. Industrial Processes	137,048		21	331	-	24,957	-	9,606	-	0.4	151	2,935	966	291
A. Mineral Products	101,669		0	0							43	30	244	45
B. Chemical Industry	10,115		10	331	-	2,340	-	70	-	0.0	57	124	361	115
C. Metal Production	21,394		6	0				8,049		0.1	22	2,668	18	72
D. Other Production	761										15	13	225	32
E. Production of Halocarbons and SF ₆						21,716		380		0.0				
F. Consumption of Halocarbons and SF ₆						543		901		0.3				
G. Other	3,108		5	0	-	359	-	206	-	0.0	13	101	117	27
3. Solvent and Other Product Use	5,746			11							0	2	3,997	0
4. Agriculture	2,321	0	8,647	686							33	414	815	1
A. Enteric Fermentation			6,416											
B. Manure Management			1,920	88									1	
C. Rice Cultivation			106	1									0	
D. Agricultural Soils	2,321	0	186	596							16		760	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			20	1							17	414	54	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-209,145	117	25							8	196	1,449	0
A. Changes in Forest and Other Woody Biomass Stocks	-	-252,575												
B. Forest and Grassland Conversion	13,239		23	6							6	196	12	
C. Abandonment of Managed Lands	-	-171												
D. CO ₂ Emissions and Removals from Soil	27,626	-												
E. Other	2,735	-	95	19							2	0	1,437	0
6. Waste	5,758		6,486	14							54	830	113	24
A. Solid Waste Disposal on Land	369		6,080								2	48	40	1
B. Wastewater Handling			273	12							0	0	5	
C. Waste Incineration	5,389		45	2							52	781	49	23
D. Other	0		89	0							0	1	20	0
7. Other	2,149	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	169,439		9	4							1,481	309	187	898
Aviation	65,448		5	2							244	199	68	18
Marine	103,991		5	3							1,237	110	120	881
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	135,900													

Notes:

In order to obtain a complete EC inventory, for Luxembourg the following data gap filling procedure was used: Emissions reported for 1990 were taken as first estimates. However, for CO₂ emissions from fossil fuel combustion (CRF category 1 'Energy'), the 1990 estimates in combination with trend information for 1992 from latest calculations of CO₂ emissions from fossil fuels by Eurostat have been used (Eurostat, 2000).

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001.

EU-15 1993

Table B.5.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,208,245	-218,829	19,353	1,187	-	27,178	-	8,232	-	0.4	12,246	43,746	14,865	12,351
1. Energy	3,060,806		4,379	163							12,019	39,652	7,765	12,061
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,037,289		739	162							11,990	39,520	6,567	11,741
1. Energy Industries	1,059,132		40	46							2,371	440	54	7,883
2. Manufacturing Industries and Construction	570,552		49	27							1,525	3,253	132	2,084
3. Transport	740,970		192	53							6,729	28,620	5,371	644
4. Other Sectors	653,578		456	35							1,286	7,125	998	957
5. Other	13,057		1	1							78	83	13	173
B. Fugitive Emissions from Fuels	23,516		3,641	1							29	132	1,197	321
1. Solid Fuels	5,682		2,008	0							1	82	7	14
2. Oil and Natural Gas	17,834		1,633	1							28	50	1,190	307
2. Industrial Processes	131,854		22	302	-	27,178	-	8,232	-	0.4	138	2,809	957	265
A. Mineral Products	97,146		0	0							43	30	261	41
B. Chemical Industry	9,527		9	302	-	2,340	-	70	-	0.0	45	125	353	102
C. Metal Production	21,910		7	0				6,578		0.1	20	2,542	18	69
D. Other Production	644										15	13	223	30
E. Production of Halocarbons and SF ₆						22,517		281		0.0				
F. Consumption of Halocarbons and SF ₆					-	1,965	-	1,100	-	0.3				
G. Other	2,628		6	0	-	355	-	204	-	0.0	15	100	101	23
3. Solvent and Other Product Use	5,339			11							0	2	3,905	0
4. Agriculture	2,230	0	8,577	674							26	267	739	1
A. Enteric Fermentation			6,376											
B. Manure Management			1,897	90									1	
C. Rice Cultivation			106										0	
D. Agricultural Soils	2,230	0	185	584							14		702	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			13	0							12	267	36	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-218,829	117	19							8	201	1,386	1
A. Changes in Forest and Other Woody Biomass Stocks	-	-261,887												
B. Forest and Grassland Conversion	13,624		22	0							6	201	22	1
C. Abandonment of Managed Lands	-	-190												
D. CO ₂ Emissions and Removals from Soil	26,938	-												
E. Other	2,687	-	95	19							2	0	1,364	0
6. Waste	5,826		6,257	14							55	815	114	22
A. Solid Waste Disposal on Land	357		5,850								1	47	40	1
B. Wastewater Handling			266	12							0	0	5	
C. Waste Incineration	5,469		44	3							53	767	47	21
D. Other	0		96	0							0	1	21	0
7. Other	2,190	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	179,831		9	4							1,558	298	185	959
Aviation	72,065		5	2							279	182	66	19
Marine	107,766		4	3							1,280	116	119	940
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	140,006													

Notes:

In order to obtain a complete EC inventory, for Luxembourg the following data gap filling procedure was used: Emissions reported for 1990 were taken as first estimates. However, for CO₂ emissions from fossil fuel combustion (CRF category 1 'Energy'), the 1990 estimates in combination with trend information for 1993 from latest calculations of CO₂ emissions from fossil fuels by Eurostat have been used (Eurostat, 2000).

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990-99*, EEA Technical report No 60, April 2001.

Table B.6.

EU-15 1994

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
		emissions	removals			P	A	P	A	P	A				
		(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals		3,220,706	-205,731	18,842	1,219	-	32,174	-	7,524	-	0.5	11,872	41,862	14,745	11,198
1. Energy		3,067,953		3,925	168							11,651	37,519	7,417	10,910
A. Fuel Combustion	Reference Approach	-													
	Sectoral Approach	3,041,926		687	166							11,619	37,353	6,223	10,627
1. Energy Industries		1,063,455		42	47							2,262	427	63	7,093
2. Manufacturing Industries and Construction		593,094		51	28							1,504	3,441	131	1,895
3. Transport		749,211		184	58							6,525	26,786	5,085	668
4. Other Sectors		624,692		409	33							1,252	6,619	930	798
5. Other		11,475		1	1							75	80	13	174
B. Fugitive Emissions from Fuels		26,027		3,238	1							32	166	1,194	283
1. Solid Fuels		5,660		1,634	0							1	85	7	11
2. Oil and Natural Gas		20,367		1,605	1							32	81	1,186	272
2. Industrial Processes		137,602		23	315	-	32,174	-	7,524	-	0.5	133	3,126	930	265
A. Mineral Products		101,283		0	0							42	30	241	42
B. Chemical Industry		9,344		10	315	-	2,340	-	20	-	0.0	45	126	352	97
C. Metal Production		22,790		6	0				5,729		0.1	20	2,842	15	66
D. Other Production		657										16	12	232	25
E. Production of Halocarbons and SF ₆							26,256		228		0.0				
F. Consumption of Halocarbons and SF ₆						-	2,955	-	1,335	-	0.3				
G. Other		3,528		6	0	-	623	-	212	-	0.0	11	115	90	35
3. Solvent and Other Product Use		5,319			11							0	2	3,907	0
4. Agriculture		2,069	0	8,553	685							27	259	804	1
A. Enteric Fermentation				6,334											
B. Manure Management				1,906	88									1	
C. Rice Cultivation				115	1									0	
D. Agricultural Soils		2,069	0	186	596							16		770	
E. Prescribed Burning of Savannas				0	0							0	0	0	
F. Field Burning of Agricultural Residues				12	0							12	259	33	1
G. Other				0	0							0	0	0	0
5. Land-Use Change and Forestry		-	-205,731	113	21							7	167	1,574	0
A. Changes in Forest and Other Woody Biomass Stocks			-246,914												
B. Forest and Grassland Conversion		12,748		19	0							5	167	17	
C. Abandonment of Managed Lands		-	-192												
D. CO ₂ Emissions and Removals from Soil		25,868	-												
E. Other		2,759	-	94	21							2	0	1,557	0
6. Waste		5,560		6,225	14							53	789	114	21
A. Solid Waste Disposal on Land		290		5,813								1	41	39	1
B. Wastewater Handling				267	12							0	0	5	
C. Waste Incineration		5,270		44	3							52	747	47	20
D. Other		0		101	0							0	1	24	0
7. Other		2,203	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:															
International Bunkers		178,171		9	4							1,529	341	187	919
Aviation		73,341		5	2							280	223	79	19
Marine		104,830		4	2							1,249	118	107	900
Multilateral Operations		0		0	0							0	0	0	0
CO ₂ Emissions from Biomass		141,829													

Note:

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001.

EU-15 1995

Table B.7.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,258,070	-197,831	18,782	1,224	-	37,256	-	7,824	-	0.5	11,509	40,513	14,313	10,138
1. Energy	3,102,658		3,927	176							11,291	36,046	7,103	9,867
A. Fuel Combustion														
Reference Approach														
Sectoral Approach	3,078,842		672	175							11,259	35,908	5,957	9,595
1. Energy Industries	1,077,058		45	48							2,176	429	68	6,444
2. Manufacturing Industries and Construction	599,090		50	30							1,474	3,310	128	1,753
3. Transport	756,149		177	63							6,270	25,691	4,823	559
4. Other Sectors	633,530		398	34							1,265	6,398	925	671
5. Other	13,015		1	1							74	80	13	168
B. Fugitive Emissions from Fuels	23,816		3,255	1							32	139	1,146	272
1. Solid Fuels	5,816		1,707	0							2	91	7	8
2. Oil and Natural Gas	17,999		1,548	1							31	48	1,138	264
2. Industrial Processes	141,082		23	315	-	37,256	-	7,824	-	0.5	131	3,321	946	250
A. Mineral Products	102,488		0	0							43	21	251	46
B. Chemical Industry	9,993		11	314	-	1,170	-	0	-	0.0	42	132	368	104
C. Metal Production	24,944		6	0				5,789		0.1	21	3,046	16	55
D. Other Production	671										16	13	230	24
E. Production of Halocarbons and SF ₆						29,798		175		0.0				
F. Consumption of Halocarbons and SF ₆					-	5,369	-	1,605	-	0.4				
G. Other	2,986		6	0	-	919	-	255	-	0.0	10	110	81	21
3. Solvent and Other Product Use	5,347			11							0	2	3,805	0
4. Agriculture	1,726	0	8,551	683							25	230	784	1
A. Enteric Fermentation			6,322											
B. Manure Management			1,918	87									1	
C. Rice Cultivation			114										0	
D. Agricultural Soils	1,726	0	185	595							15		755	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			11	0							10	230	29	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-197,831	109	21							6	132	1,561	0
A. Changes in Forest and Other Woody Biomass Stocks		-238,355												
B. Forest and Grassland Conversion	11,877		15	0							4	132	13	
C. Abandonment of Managed Lands		-198												
D. CO ₂ Emissions and Removals from Soil	26,061	-												
E. Other	2,783	-	94	21							2	0	1,547	0
6. Waste	5,037		6,171	14							55	781	114	20
A. Solid Waste Disposal on Land	124		5,753									28	35	
B. Wastewater Handling			266	12							0	0	5	
C. Waste Incineration	4,545		43	3							51	753	46	18
D. Other	368		109	0							3	1	28	1
7. Other	2,219	0	2	4	0	0	0	0	0	0	0	0	1	0
Memo Items:														
International Bunkers	182,808		11	5							1,549	312	183	938
Aviation	76,571		5	2							297	194	72	20
Marine	106,237		6	3							1,253	118	111	918
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	149,412													

Note:

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990-99*, EEA Technical report No 60, April 2001.

Table B.8.

EU-15 1996

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,332,938	-205,973	18,446	1,254	-	41,039	-	7,761	-	0.5	11,326	39,231	13,831	8,840
1. Energy	3,179,916		3,788	181							11,100	35,009	6,896	8,575
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,155,827		691	180							11,069	34,872	5,758	8,312
1. Energy Industries	1,086,066		49	49							2,099	459	74	5,501
2. Manufacturing Industries and Construction	588,702		50	27							1,470	3,141	142	1,525
3. Transport	773,011		174	67							6,111	24,588	4,538	477
4. Other Sectors	695,931		417	35							1,320	6,623	994	641
5. Other	12,117		1	1							68	60	10	168
B. Fugitive Emissions from Fuels	24,088		3,098	1							31	137	1,138	263
1. Solid Fuels	5,419		1,526	0							2	91	7	9
2. Oil and Natural Gas	18,669		1,572	1							30	46	1,131	254
2. Industrial Processes	138,607		23	323	-	41,039	-	7,761	-	0.5	139	3,037	909	245
A. Mineral Products	100,061		0	0							45	20	217	47
B. Chemical Industry	9,988		15	323	-	0	-	0	-	0.0	50	167	385	99
C. Metal Production	23,954		6	0				5,696		0.1	28	2,810	19	65
D. Other Production	705										15	13	235	25
E. Production of Halocarbons and SF ₆						31,537		175		0.0				
F. Consumption of Halocarbons and SF ₆						8,741	-	1,729	-	0.4				
G. Other	3,899		1	0	-	761	-	161	-	0.0	0	27	53	9
3. Solvent and Other Product Use	5,373			11							0	2	3,761	0
4. Agriculture	1,825	0	8,585	700							30	275	713	1
A. Enteric Fermentation			6,358											
B. Manure Management			1,910	92									1	
C. Rice Cultivation			119	1									0	
D. Agricultural Soils	1,825	0	185	606							17		675	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			13	0							12	275	38	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-205,973	109	21							6	126	1,435	0
A. Changes in Forest and Other Woody Biomass Stocks		-246,305												
B. Forest and Grassland Conversion	11,528		15	0							4	126	13	
C. Abandonment of Managed Lands	-	-200												
D. CO ₂ Emissions and Removals from Soil	26,337	-												
E. Other	2,666	-	95	21							2	0	1,423	0
6. Waste	4,850		5,939	15							52	783	117	18
A. Solid Waste Disposal on Land	82		5,492									24	35	
B. Wastewater Handling	3		271	12							0	0	5	
C. Waste Incineration	4,765		44	3							50	758	47	17
D. Other	0		133	0							2	1	31	1
7. Other	2,367	0	2	4	0	0	0	0	0	0	0	0	1	0
Memo Items:														
International Bunkers	194,577		11	5							1,641	319	193	994
Aviation	81,665		6	2							310	202	75	21
Marine	112,913		5	3							1,332	117	118	973
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	153,605													

Note:

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001.

EU-15 1997

Table B.9.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,272,091	-204,354	18,051	1,244	-	46,851	-	7,415	-	0.5	10,872	37,470	13,232	7,969
1. Energy	3,119,782		3,639	183							10,655	33,037	6,506	7,726
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,096,202		648	183							10,625	32,905	5,412	7,468
1. Energy Industries	1,045,530		48	48							1,923	395	59	4,972
2. Manufacturing Industries and Construction	606,499		50	29							1,505	3,236	134	1,432
3. Transport	783,278		165	72							5,853	22,992	4,274	327
4. Other Sectors	645,558		384	33							1,274	6,217	934	558
5. Other	15,338		0	1							70	65	11	180
B. Fugitive Emissions from Fuels	23,580		2,991	0							30	132	1,094	258
1. Solid Fuels	5,701		1,449	0							1	91	7	6
2. Oil and Natural Gas	17,879		1,542	0							29	41	1,087	252
2. Industrial Processes	138,269		20	315	-	46,851	-	7,415	-	0.5	132	3,186	978	226
A. Mineral Products	103,063		0	0							44	21	283	45
B. Chemical Industry	9,883		13	315	-	0	-	0	-	0.0	35	123	362	89
C. Metal Production	24,231		6	0				5,364		0.1	22	2,888	16	52
D. Other Production	699										16	14	245	24
E. Production of Halocarbons and SF ₆						33,183		175		0.0				
F. Consumption of Halocarbons and SF ₆					-	12,571	-	1,708	-	0.4				
G. Other	398		0	0	-	1,097	-	167	-	0.0	15	140	72	16
3. Solvent and Other Product Use	5,514			11							0	2	3,753	0
4. Agriculture	2,065	0	8,531	698							28	254	382	1
A. Enteric Fermentation			6,301											
B. Manure Management			1,915	91									1	
C. Rice Cultivation			119	1									0	
D. Agricultural Soils	2,065	0	184	606							16		348	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			12	0							11	254	34	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-204,354	106	18							6	145	1,493	0
A. Changes in Forest and Other Woody Biomass Stocks		-242,848												
B. Forest and Grassland Conversion	11,418		16	0							4	145	15	
C. Abandonment of Managed Lands	-	-201												
D. CO ₂ Emissions and Removals from Soil	28,061	-												
E. Other		-785	90	18							2	0	1,478	0
6. Waste	4,292		5,753	15							51	846	118	15
A. Solid Waste Disposal on Land	65		5,269									22	32	
B. Wastewater Handling			279	12							0	0	6	
C. Waste Incineration	4,081		47	3							49	823	50	14
D. Other	145		158	0							2	1	30	1
7. Other	2,170	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	209,989		11	5							1,798	339	209	1,088
Aviation	86,900		6	2							332	217	81	23
Marine	123,089		5	3							1,466	122	129	1,065
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	153,688													

Note:

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990-99*, EEA Technical report No 60, April 2001.

Table B.10.

EU-15 1998

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,316,965	-195,368	17,636	1,167	-	51,394	-	7,979	-	0.5	10,499	35,497	12,398	7,549
1. Energy	3,162,620		3,462	181							10,288	31,109	5,990	7,309
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,138,599		662	181							10,257	30,989	5,014	7,046
1. Energy Industries	1,082,775		66	48							1,839	407	62	4,662
2. Manufacturing Industries and Construction	588,101		56	25							1,429	2,870	138	1,274
3. Transport	809,112		159	76							5,676	21,635	3,921	411
4. Other Sectors	646,440		380	31							1,266	6,018	885	514
5. Other	12,170		0	0							47	59	8	185
B. Fugitive Emissions from Fuels	24,022		2,800	0							31	119	976	264
1. Solid Fuels	5,466		1,265	0							1	77	7	3
2. Oil and Natural Gas	18,556		1,535	0							30	41	970	261
2. Industrial Processes	139,852		20	237	-	51,394	-	7,979	-	0.5	128	3,022	934	224
A. Mineral Products	105,960		0	0							44	23	277	50
B. Chemical Industry	9,983		13	237	-	0	-	0	-	0.0	40	146	333	91
C. Metal Production	22,784		6	0				5,969		0.1	28	2,839	19	63
D. Other Production	655										15	14	254	20
E. Production of Halocarbons and SF ₆						33,984		217		0.0				
F. Consumption of Halocarbons and SF ₆					-	17,410	-	1,793	-	0.4				
G. Other	475		0	0	-	0	-	0	-	0.0	0	2	50	1
3. Solvent and Other Product Use	5,593			11							0	2	3,661	0
4. Agriculture	2,031	0	8,357	701							29	275	374	1
A. Enteric Fermentation			6,264											
B. Manure Management			1,781	90									1	
C. Rice Cultivation			113	1									0	
D. Agricultural Soils	2,031	0	185	610							16		337	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			13	0							12	275	37	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-195,368	120	18							10	261	1,320	0
A. Changes in Forest and Other Woody Biomass Stocks		-237,279												
B. Forest and Grassland Conversion	15,485		30	0							7	261	27	
C. Abandonment of Managed Lands	-	-201												
D. CO ₂ Emissions and Removals from Soil	27,559	-												
E. Other	-	-932	90	18							2	0	1,294	0
6. Waste	4,354		5,676	15							45	828	119	14
A. Solid Waste Disposal on Land	59		5,171									21	32	
B. Wastewater Handling			285	12							0	0	6	
C. Waste Incineration	4,111		46	3							43	806	50	13
D. Other	185		174	0							2	1	32	1
7. Other	2,514	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	219,161		12	5							1,766	348	220	1,095
Aviation	91,250		6	2							361	225	84	25
Marine	127,911		5	3							1,405	123	136	1,070
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	143,673													

Note:

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001.

EU-15 1999

Table B.11.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CO ₂	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NM VOC	SO ₂
	emissions	removals			P	A	P	A	P	A				
	(Gg)				CO ₂ equivalent (Gg)				(Gg)					
Total National Emissions and Removals	3,270,520	-200,984	17,445	1,092	-	42,620	-	8,361	-	0.5	10,136	33,602	12,004	6,803
1. Energy	3,113,743		3,337	186							9,925	29,574	5,603	6,572
A. Fuel Combustion														
Reference Approach	-													
Sectoral Approach	3,089,406		661	185							9,892	29,471	4,721	6,338
1. Energy Industries	1,044,485		73	48							1,716	395	65	4,306
2. Manufacturing Industries and Construction	581,506		55	26							1,419	2,935	140	1,150
3. Transport	824,974		152	80							5,464	20,044	3,597	383
4. Other Sectors	631,319		381	31							1,252	6,045	911	492
5. Other	7,121		0	0							42	52	8	8
B. Fugitive Emissions from Fuels	24,337		2,676	0							32	103	882	233
1. Solid Fuels	6,042		1,156	0							1	67	5	1
2. Oil and Natural Gas	18,296		1,520	0							31	36	877	232
2. Industrial Processes	142,214		20	155	-	42,620	-	8,361	-	0.5	129	2,758	909	216
A. Mineral Products	107,724		0	0							44	22	282	45
B. Chemical Industry	9,410		13	155	-	0	-	0	-	0.0	42	149	310	91
C. Metal Production	23,883		6	0				6,272		0.1	27	2,571	18	60
D. Other Production	735										16	13	255	20
E. Production of Halocarbons and SF ₆						20,432		85		0.0				
F. Consumption of Halocarbons and SF ₆					-	22,189	-	2,005	-	0.4				
G. Other	466		0	1	-	0	-	0	-	0.0	0	2	43	1
3. Solvent and Other Product Use	5,614			11							0	2	3,628	0
4. Agriculture	2,016	0	8,431	703							28	249	390	1
A. Enteric Fermentation			6,222											
B. Manure Management			1,901	94									1	
C. Rice Cultivation			112	1									0	
D. Agricultural Soils	2,016	0	185	607							17		357	
E. Prescribed Burning of Savannas			0	0							0	0	0	
F. Field Burning of Agricultural Residues			12	0							11	249	33	1
G. Other			0	0							0	0	0	0
5. Land-Use Change and Forestry	-	-200,984	105	18							6	138	1,352	0
A. Changes in Forest and Other Woody Biomass Stocks	-	-238,871												
B. Forest and Grassland Conversion	12,153		16	0							4	138	3	
C. Abandonment of Managed Lands	-	-202												
D. CO ₂ Emissions and Removals from Soil	26,788	-												
E. Other	-	-851	90	18							2	0	1,349	0
6. Waste	4,388		5,549	15							49	881	121	14
A. Solid Waste Disposal on Land	53		5,025									21	30	
B. Wastewater Handling			286	12							0	0	5	
C. Waste Incineration	4,151		48	3							46	860	53	13
D. Other	184		191	0							2	1	33	1
7. Other	2,544	0	2	4	0	0	0	0	0	0	0	0	0	0
Memo Items:														
International Bunkers	223,690		10	5							1,729	356	220	1,030
Aviation	97,963		5	2							396	244	89	24
Marine	125,727		5	3							1,334	112	131	1,005
Multilateral Operations	0		0	0							0	0	0	0
CO₂ Emissions from Biomass	146,569													

Notes:

In order to obtain a complete EC inventory, for Belgium and Luxembourg the following data gap filling procedure was used: Emissions reported for 1998 were taken as first estimates. However, for CO₂ emissions from fossil fuel combustion (CRF category 1 'Energy'), the 1998 estimates in combination with trend information for 1999 from latest calculations of CO₂ emissions from fossil fuels by Eurostat have been used (Eurostat, 2001).

Category 5 'Land-Use Change and Forestry' provides 'net' emissions (Member States' emissions minus Member States' removals) of CO₂ following CRF recommendations.

Source: EC submission to the UNFCCC Secretariat *Annual EC greenhouse gas inventory 1990-99*, EEA Technical report No 60, April 2001.

Anthropogenic annual emissions of heavy metals 1990–99

B.12.	Party: European Community; Sector: All sectors									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Lead (Pb)										
Cadmium (Cd)										
Mercury (Hg)										
Arsenic (As)										
Chromium (Cr)										
Copper (Cu)										
Nickel (Ni)										
Selenium (Se)										
Zinc (Zn)										

Pb, Cd and Hg are the heavy metals referred to in Article 3, paragraph 1, and in Annex I to the 1998 Protocol on Heavy Metals.

The rest are to be reported on a voluntary basis.

Units: Tonnes per year.

Anthropogenic annual emissions of persistent organic pollutants 1990–99

B.13.	Party: European Community									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
ANNEX I ^a										
Aldrin (CAS: 309-00-2)										
Chlordane (CAS: 57-74-9)										
Chlordecone (CAS: 143-50-0)										
Dieldrin (CAS: 60-57-1)										
Endrin (CAS: 72-20-8)										
Heptachlor (CAS: 76-44-8)										
Hexabromobiphenyl (CAS: 36355-01-8)										
Mirex (CAS: 2385-85-5)										
Toxaphene (CAS: 8001-35-2)										
ANNEX II ^b										
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)										
DDT (CAS: 50-29-3) (***)										
Polychlorinated biphenyls (PCBs) (****)										
ANNEX III ^c										
Dioxins and furans										
Polycyclic aromatic hydrocarbons (PAHs) (*)										
Hexachlorobenzene (HCB) (**) (CAS: 118-74-1)										
OTHER ^d										
Pentachlorophenol (PCP) (CAS: 87-86-5)										
Short-chained chlorinated paraffins (CAS: 85535-84-8)										

Units in kilograms per year except for dioxins and furans, which are reported in gram toxic equivalents (Teq) per year (as defined by the NATO CCMS international toxic equivalent scheme). For PAHs, units in tonnes per year. Please list PAHs and sources included in this inventory. All air emissions should be reported in this table (e.g. HCB can be used as a pesticide but can also be emitted as a by-product of combustion and as a contaminant in other pesticides).

Notes:

(¹) The POPs listed in Annex I to the Protocol on POPs are substances scheduled for elimination.

(²) The POPs listed in Annex II to the Protocol on POPs are substances scheduled for restriction on use.

(***) DDT is also listed in Annex I.

(****) PCBs are also listed in Annex I.

(³) The POPs listed in Annex III to the Protocol on POPs are substances referred to in Article 3, paragraph 5(a), of the Protocol.

(*) Polycyclic aromatic hydrocarbons (PAHs): For the purposes of the emission inventories, the following four indicator compounds shall be used: benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene.

(**) HCB is also included in Annex I to the Protocol as a substance scheduled for elimination.

(⁴) See Article 8 of the Protocol ('Research, development and monitoring'; reporting voluntary).

Anthropogenic annual use and production of persistent organic pollutants 1990–99

Party: European Community														B.14.						
ANNEX I ^{1/}	1990		1991		1992		1993		1994		1995		1996		1997		1998		1999	
	use	prod.	use	prod.	use	prod.	use	prod.	use	prod.	use	prod.	use	prod.	use	prod.	use	prod.	use	prod.
Aldrin (CAS: 309-00-2)																				
Chlordane (CAS: 57-74-9)																				
Chlordecone (CAS: 143-50-0)																				
Dieldrin (CAS: 60-57-1)																				
Endrin (CAS: 72-20-8)																				
Heptachlor (CAS: 76-44-8)																				
Hexabromobiphenyl (CAS: 36355-01-8)																				
Mirex (CAS: 2385-85-5)																				
Toxaphene (CAS: 8001-35-2)																				
ANNEX II ^{2/}																				
Hexachlorocyclohexane (HCH) (CAS: 608-73-1)																				
DDT (CAS: 50-29-3) (***)																				
Polychlorinated biphenyls (PCBs) (****)																				
ANNEX III ^{3/}																				
Dioxins and furans																				
Polyaromatic hydrocarbons (PAHs) (*)																				
Hexachlorobenzene (HCB) (**) (CAS: 118-74-1)																				
OTHER ^{4/}																				
Pentachlorophenol (PCP) (CAS: 87-86-5)																				
Short-chained chlorinated paraffins (CAS: 85535-84-8)																				

Units in kilograms per year except for dioxins and furans, which are reported in gram toxic equivalents (Teq) per year (as defined by the NATO CCMS international toxic equivalent scheme). For PAHs, units in tonnes per year. Please list PAHs and sources included in this inventory. State use and/or production with X in the table if exact quantity uncertain.

Notes:

- (¹⁾) The POPs listed in Annex I to the Protocol on POPs are substances scheduled for elimination.
- (²) The POPs listed in Annex II to the Protocol on POPs are substances scheduled for restriction on use.
 - (***) DDT is also listed in Annex I.
 - (****) PCBs are also listed in Annex I.
- (³) The POPs listed in Annex III to the Protocol on POPs are substances referred to in Article 3, paragraph 5(a), of the Protocol.
 - (*) Polycyclic aromatic hydrocarbons (PAHs): For the purposes of the emission inventories, the following four indicator compounds shall be used: benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene.
 - (**) HCB is also included in Annex I to the Protocol as a substance scheduled for elimination.
- (⁴) See Article 8 of the Protocol ('Research, development and monitoring').

**Annex C: Note to the EC submission to the Executive
Body of the UNECE Convention on Long-
range Transboundary Air Pollution regarding
European Community NO_x emissions
1987–89**

European Community NO_x emissions 1987–89

**Note to the EC submission to the Executive Body
of the UNECE Convention on Long-range
Transboundary Air Pollution**

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January 2002

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1. The purpose of this note

As a party to the 1988 NO_x Protocol and in response to the fourth report of the Implementation Committee of the UNECE/CLRTAP (EB.AIR/2001/3), in this note the European Community submits total annual NO_x emissions for 1987–89. Therefore, this note provides supplemental information to the official UNECE/CLRTAP submission of the European Community *Annual European Community CLRTAP emission inventory 1990–99*.

The data on NO_x emissions 1987–89 are given in this separate note because the time series 1987–89 is not entirely consistent with the time series 1990–99 provided in the submission to the Executive Body of the UNECE/CLRTAP. The inconsistencies are due to the lack of consistent Member States' data and the subsequent use of different databases.

- (i) For the time series 1987–89, data as submitted under the Environmental Information and Observation Network (EIONET) have been used. As no officially agreed data gap filling procedure exists, data gaps were filled by EMEP data and EEA interpolations.
- (ii) For the time series 1990–99, data as compiled for the EC UNFCCC submission were used (*Annual European Community greenhouse gas inventory 1990–99*, EEA Technical report No 60, April 2001). The reason for using the EC inventory to the UNFCCC is that the data availability is better and that an officially agreed procedure for data gap filling exists.

The two time series differ slightly due to different treatment of overseas territories and international bunkers.

2. Data availability

Table 1 shows the data basis for the time series 1987–89 of EC NO_x emissions as of 1 December 2001. For Member States where no data were available under the EIONET, EMEP data were used. If no EMEP data were available, data were estimated by the EEA. EEA data estimates were made for Greece (1988–89), Luxembourg (1987–89) and Portugal (1989).

Table 1

Data availability of NO_x

	1987	1988	1989
Austria	√	√	√
Belgium	•	•	•
Denmark	√	√	√
Finland	√	√	√
France	√	√	√
Germany	√	√	√
Greece	E	I	I
Ireland	o	o	o
Italy	•	•	•
Luxembourg	I	I	I
Netherlands	√	√	√
Portugal	E	E	I
Spain	√	√	√
Sweden	√	√	√
United Kingdom	E	E	E

o... submitted for UNECE 1999 (due 31 December 1998) with copy to the EEA.

²... submitted for UNECE 2000 (due 31 December 1999) with copy to the EEA.

÷... submitted for UNECE 2001 (due 31 December 2000) with copy to the EEA.

I... EEA interpolation.

E... EMEP data (home page).

3. European Community CLRTAP emission data

Table 2 shows the time series 1987–89 of EC NO_x emissions as of 1 December 2001.

Anthropogenic annual emissions of NO _x 1987–89 (1 000 tonnes) Party: European Community; Sector: All sectors				Table 2
	1987	1988	1989	
EU15	13446	13464	13563	

Note:

This time series is based on Member States' UNECE/CLRTAP data and EEA estimates and is therefore slightly inconsistent with the time series 1990–99 provided in the UNECE/CLRTAP submission of the European Community (Technical report No 73).

European Environment Agency

**Annual European Community CLRTAP emission inventory 1990–99
Submission to the Executive Body of the UNECE Convention on Long-range
Transboundary Air Pollution**

Technical report No 73

Luxembourg: Office for Official Publications of the European Communities

2002 – 37 pp. – 21 x 29.7 cm

ISBN 92-9167-415-X