

Annual European Community Greenhouse Gas Inventory 1990-1999

Submission to the Secretariat of the UNFCCC

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ETC on Air and Climate Change

11 April 2001

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Printed in Copenhagen

Printed on recycled and chlorine-free bleached paper

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Introduction

This report presents greenhouse gas inventories of the European Community as a whole (EU15) and of its individual Member States for 1990-1999 (inventories of the Member States are published on the EEA website only). The purpose of this report is to serve as the annual submission of the European Community (EC) greenhouse gas inventory to the UNFCCC, which is due on 15 April 2001. In addition, the data presented in this report is the basis of the progress evaluation report of the European Commission (due in October 2001), required under the Council Decision 99/296/EC.

The European Community inventory has been compiled under Council Decision 99/296/EC for a monitoring mechanism of Community greenhouse gas emissions and is based on data delivered by the Member States by 1 April 2001. As the data are revised and updated for all years, they replace EC data previously published, in particular, in the 2000 submission by the European Commission to the UNFCCC Secretariat *Annual European Community Greenhouse Gas Inventory 1990-1998* (EEA Technical report 41, 2000) and in the report *European Community and Member States Greenhouse Gas Emission Trends 1990-1998* (EEA Topic report 6, 2000).

Table 1 gives an overview of the main trends in EC greenhouse gas emissions and removals for 1990-1999.

Table 1: Overview of EC greenhouse gas emissions and removals from 1990 to 1999

GREENHOUSE GAS EMISSIONS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	CO ₂ equivalent (Tg = million tons)									
Net CO ₂ emissions/removals	3,126	3,129	3,068	2,989	3,015	3,060	3,127	3,068	3,122	3,070
CO ₂ emissions (without LUCF)	3,325	3,351	3,277	3,208	3,221	3,258	3,333	3,272	3,317	3,271
CH ₄	440	429	418	406	396	394	387	379	370	366
N ₂ O	394	392	383	368	378	379	389	386	362	338
HFCs	26	25	25	27	32	37	41	47	51	43
PFCs	14	12	10	8	8	8	8	7	8	8
SF ₆	8	9	10	10	11	12	12	12	11	11
Total (with net CO₂ emissions/removals)	4,007	3,996	3,913	3,810	3,839	3,891	3,964	3,898	3,924	3,836
Total (without LUCF)	4,199	4,209	4,112	4,020	4,036	4,080	4,161	4,095	4,111	4,030

Note: Global warming potentials (GWPs) used (100 years time horizon): carbon dioxide (CO₂)=1; methane (CH₄)=21; nitrous oxide (N₂O)=310; sulphur hexafluoride (SF₆)=23900

This report presents the legal basis of the compilation of the EC inventory, the inventory methodology, changes compared to last year's submission and the data of the EC as available by 1 April 2001 (Annex A). Annex B and C include the Summary Reports 1.A of the EC Member States and the complete CRF Tables as submitted by the Member States to the European Commission under the Monitoring Mechanism (Annex B and C are available on the EEA website only).

1. The EC Monitoring Mechanism

The legal basis of the compilation of the EC inventory is Council Decision 99/296/EC amending Council Decision 93/389/EEC for a *Monitoring Mechanism of Community CO₂ and other Greenhouse Gas Emissions*¹. The purpose of this decision is to monitor all anthropogenic greenhouse gas emissions not controlled by the Montreal Protocol in the EC

¹ OJ L 117, 5.5.1999, p. 35

Member States and to evaluate progress towards meeting greenhouse gas reduction commitments under the UNFCCC and the Kyoto Protocol (KP).

Under the provisions of Art 3.2 of Council Decision 99/296/EC, the Member States shall report to the Commission each year, not later than 31 December:

- their anthropogenic CO₂ emissions by sources and removal by sinks for the previous calendar year;
- final national inventory data on emissions by sources and removals by sinks for the other greenhouse gases for the previous year but one and provisional emission data (inventories) for the previous year.

Other greenhouse gases include the five other Kyoto Protocol greenhouse gases: methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). In addition, annual information on emissions of the following gases shall be provided: carbon monoxide (CO), nitrogen oxides (NO_x), non methane volatile organic compounds (NMVOCs) and sulphur oxides, in line with the reporting requirements under the UNFCCC.

The reporting requirements for the Member States under Council Decision 99/296/EC are elaborated in additional Guidelines under this Decision, in particular "Part 1: Guidelines for Member States and EC annual inventories". According to the Decision and these additional Guidelines the reporting requirements are exactly the same as for the UNFCCC, regarding content and format. The Member States therefore use the *UNFCCC guidelines on reporting and review* (document FCCC/CP/1999/7), which contain many elements, including the new Common Reporting Format (CRF) and a "National Inventory Report" that contains background information.

In addition, the Member States use the report "Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories" (IPCC, 2000), which is consistent with the IPCC (1996) Guidelines. The use of this report by countries is expected to lead to more reliable estimates of the magnitude of absolute and trend uncertainties in reported greenhouse gas inventories.

Based on the data provided by the Member States, the Commission establishes the Community greenhouse gas inventory and circulates this to all Member States by 1 March each year. This procedure aims at achieving the best available Member States' data on greenhouse gas emissions and removals for the compilation of the final annual EC greenhouse gas inventory (due 15 April each year). In exceptional cases, Member States have the possibility to provide updated information to the Commission until 1 April each year. This final inventory is required for two purposes:

1. **The annual greenhouse gas inventory submission to UNFCCC:** The European Community, as the only regional economic integration organisation having joined the UNFCCC as a Party, has to report annually on greenhouse gas inventories within the area covered by its Member States. The EC greenhouse gas inventory including data of the EC as a whole (EU15) and of the individual Member States has to be submitted by the European Commission to the UNFCCC by 15 April each year, i.e. 1½ month after the circulation under the Monitoring Mechanism.
2. **The progress evaluation report under Decision 99/296/EC:** Under the Monitoring Mechanism, the European Commission has to assess annually, whether the actual and projected progress of Member States is sufficient to ensure fulfilment of the EC's

commitments under the UNFCCC and the Kyoto Protocol. For this purpose, the Commission has to prepare a progress evaluation report, which has to be forwarded to the European Parliament and the Council by October each year. The annual EC inventory is an important element for the evaluation of actual progress.

The European Environment Agency (EEA) assists the Commission in the compilation of the annual EC inventory for both purposes, through the work of the European Topic Centre on Air and Climate Change (ETC/ACC). The activities of the EEA result in:

- Draft EC inventory by 1 March
- Final EC inventory by 15 April (to be submitted by the European Commission to the UNFCCC Secretariat)

The annual process of reporting, review and compilation of the EC inventory is summarised in Table 2.

Table 2: Annual process of submission and review of MS inventories and compilation of the EC inventory ¹⁾

Element	Who	When	What
1. Submission of annual inventory by MS	Member States	31 December annually	Anthropogenic CO ₂ emissions and CO ₂ removals by sinks, for the year n-1 Emissions by source and removals by sinks of the other greenhouse gases; Final data for the year n-2 and provisional data for the year n-1 ²⁾
2. Initial check of MS submissions	European Commission (incl. Eurostat), assisted by EEA	up to 1 March	Initial checks (by EEA) Comparison of energy data in MS IPCC Reference Approach with Eurostat energy data (by Eurostat and MS)
3. Compilation and circulation of draft EC inventory	European Commission (incl. Eurostat), assisted by EEA	1 March	Draft EC inventory (by EEA), based on MS inventories and additional information where needed Circulation of the draft EC inventory on 1 March
4. Submission of updated or additional data by MS	Member States	up to 1 April	Updated or additional data submitted by MS ³⁾
5. Final annual EC inventory	European Commission (incl. Eurostat), assisted by EEA	15 April	Submission to UNFCCC of the final annual EC inventory. This inventory will also be used to evaluate progress as part of the Monitoring Mechanism
6. Additional review of MS submissions and EC inventory	European Commission (incl. Eurostat), assisted by EEA	June to December	Additional review aimed at improving the next annual MS and EC inventories In November Eurostat makes available to MS energy balance data (1990 to inventory year)

1) In accordance with Council Decision 1999/296/EC

2) In accordance with Art. 3(1) and 3(2) of Council Decision 1999/296/EC

3) Preferably updating is limited to the following situations: to remove major inconsistencies, to fill major gaps or to provide essential additional information. Documentation should be included describing which data is updated or is additional, compared to the submission of 31 December.

2. The EC inventory methodology and data

Methodology

The EC greenhouse gas inventory is compiled according to the Council Decision Guidelines and, in addition, in accordance with the recommendations for inventories set out in the *UNFCCC Guidelines for the Preparation of National Communications by Parties included in Annex 1 to the Convention, Part 1: UNFCCC Reporting Guidelines on Annual Inventories*. They are part of a comprehensive document *UNFCCC Guidelines on Reporting and Review* (document FCCC/CP/1999/7), adopted as Decision 3/CP.5. In addition, the *IPCC 1996 Guidelines for National Greenhouse Gas Inventories* have been applied.

The EC greenhouse gas inventory is compiled on basis of the inventories of the 15 EC Member States. Therefore, the quality of the EC inventory depends on the timeliness and the quality of the Member States submissions.

Table 3 summarises timeliness, time series provided and reporting formats of the Member States' submissions as by 1 April 2001.

Table 3: Date of submissions (updates submitted), data and reporting formats available from Member States by 1 April 2001

Member State	Submission dates	Latest data available	Years updated	Reporting format	Tables ¹⁾
Austria	29 Dec 2000	1999	1990-1999	CRF	All
Belgium	22 March 2001	1998	1998	CRF	Sectoral Report Tables, Summary Tables
Denmark	29 Dec 2000	1999	1990-1999	IPCC 1996 Guidelines	All
	1 April 2001	1999	1990-1999	CRF	All
Finland	15 Dec 2000	1999	1990-1999	CRF	All
	28 March 2001	1999	1990-1999	CRF	All
France	20 Dec 2000	1999	1990-1999	CRF	All
Germany	26 Feb 2001	1999	1990-1999	CRF	Summary Tables only
	1 April 2001	1999	1990-1999	CRF	Summary Tables only
Greece	1 April 2001	1999	1990-1999	CRF	Sectoral Report Tables, Summary Tables
Ireland	2 Feb 2001	1999	1990-1999	CRF	Almost all CRF Tables for 1999 only; no F-Gases
	5 April 2001	1999	1990-1999	CRF	Almost all CRF Tables for 1999 only; no F-Gases
Italy	23 Feb 2001	1999	1990-1998	CRF	Approx. two thirds of CRF Tables for 1998 only; for 1999 energy related data only
	9 April 2001	1999	1990-1999	CRF	All CRF Tables for 1998 and 1999
Luxembourg	22 Dec 1999	1998	1997-1998	IPCC 1996 Guidelines	Summary Tables 7A
Netherlands	20 Dec 2000	1999	1990-1999	CRF	All
	2 Feb 2001	1999	1990-1999	CRF	All
	30 March 2001	1999	1990-1999	CRF	All
Portugal	1 April 2001	1999	1990-1999	CRF	All

Spain	Feb 2001	1999	1990-1999	CRF	Mainly Summary Tables
	30 March 2001	1999	1990-1999	CRF	Sectoral Report Tables, Summary Tables
Sweden	22 Dec 2000	1999	1999	CRF	All
	31 March 2001	1999	1990-1999	CRF	All
	3 April 2001	1999	1994	CRF	Correction of Summary Table 1A
United Kingdom	21 Dec 2000	1999	1990-1999	CRF	All
	30 March 2001	1999	1990-1999	CRF	All

1) All = all or almost all (more than approx. 90 %) of the CRF Tables

CRF Tables and Reference Approach

The annex presents greenhouse gas emission data for the European Community (EU15) and for the Member States in the Summary Tables 1.A of the Common Reporting Format for 1990 to 1999. The complete CRF tables (including all background tables) for individual Member States are included in Annex C which is available on the EEA website.

Data on the Reference Approach for CO₂ from fossil fuel combustion are presented in Annex B for the Member States. Since not all Member States reported these data, they are omitted in the EU15 tables of Annex A.

Data gap procedure

The EC greenhouse gas inventory is compiled by adding up the inventories of the 15 EC Member States. For data gaps the following procedure has been applied:

1. Emissions reported for the most recent previous year were taken as first estimates for the missing year.
2. For CO₂ emissions from fossil fuels combustion, however, the latest estimates reported by the Member States in combination with trend information for more recent years from latest calculations of CO₂ emissions from fossil fuels by Eurostat have been used. The Eurostat estimates are compiled using the IPCC Reference Approach and consistent energy balance data, which are regularly collected by Eurostat from the EU Member States. The trend information of Eurostat CO₂ emission estimates from fossil fuels has been used to extrapolate CO₂ emission data for the CRF category 1 "Energy".

For CO₂, CH₄ and N₂O the data gap procedure has been applied for Luxembourg (1991-1993, 1999) and Belgium (1999). For F-gas emissions, the data gap procedure has been applied for Belgium (several years).

International bunkers

International bunker emissions of the EC inventory are the sum of the international bunker emissions of the Member States. Therefore, in the EC inventory, all international (including intra-EU) marine and aviation emissions are included in the Memo Item "International Bunkers".

Quality assurance/quality control (QA/QC) procedures

Part 1 of the Guidelines for MS and EC Annual Inventories under the Monitoring Mechanism (1999/196/EC) aims at improving the timeliness and quality of the annual EC inventory.

These guidelines provide guidance on the content, format and organisational aspects of the EC inventory. The EC inventory is based primarily on the annual inventories of the Member States and their national QA/QC procedures. However, at European level, the annual process of reporting, review and compilation of the EC inventory summarised in Table 2 (above), aims at improving the quality of the EC greenhouse gas inventory.

Uncertainties in industrial greenhouse gas emission estimates (HFCs, PFCs, SF₆) remain high because of remaining data gaps on industrial greenhouse gases as reported by Member States by 1 April 2001: F-gas emissions estimates are not available for Ireland and Luxembourg; for Belgium data from previous years were used to complete the time series to 1999 (see Table 4).

Table 4: Data availability of actual HFC, PFC and SF₆ emissions as reported by Member States by 1 April 2001 in CO₂ equivalents (Gg)

EC Member State		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	HFC	4	6	9	12	17	546	625	718	816	870
	PFC	963	974	576	48	54	16	15	18	21	25
	SF ₆	518	683	725	823	1033	1175	1246	1148	955	730
Belgium	HFC	332	332	332	332	332	332	418	527	527	527
	PFC	63	63	63	63	63	63	63	63	0	0
	SF ₆	335	335	335	335	335	206	206	239	206	206
Denmark	HFC	0	0	3	30	58	126	278	344	503	621
	PFC	0	0	0	0	0	0	0	4	14	30
	SF ₆	43	61	89	135	122	107	61	73	59	65
Finland	HFC	0	0	0	0	7	30	78	168	246	317
	PFC	1	1	1	1	1	1	1	1	1	29
	SF ₆	71	48	32	26	26	14	14	16	12	32
France	HFC	2253	1514	1061	804	818	1302	2186	3095	3752	4815
	PFC	3195	2469	2147	1650	1390	1350	1410	1471	1661	1915
	SF ₆	2195	2216	2238	2262	2288	2314	2387	2444	2405	2411
Germany	HFC	2340	2340	2470	3750	3980	3130	2580	3450	4278	4278
	PFC	2694	2352	2138	2012	1676	1764	1830	1554	1709	1709
	SF ₆	3896	4350	4876	5401	5784	6238	5808	5688	5473	5473
Greece	HFC	935	1107	908	1607	2144	3253	3746	3960	3744	3744
	PFC	367	315	222	130	82	78	74	64	54	28
	SF ₆	0	0	0	0	0	0	0	0	0	0
Ireland	HFC	-	-	-	-	-	-	-	-	-	-
	PFC	-	-	-	-	-	-	-	-	-	-
	SF ₆	-	-	-	-	-	-	-	-	-	-
Italy	HFC	351	355	359	355	623	919	761	1097	1332	2885
	PFC	237	231	206	204	212	255	161	167	187	172
	SF ₆	198	230	249	272	293	321	327	351	420	386
Luxembourg	HFC	-	-	-	-	-	-	-	-	-	-
	PFC	-	-	-	-	-	-	-	-	-	-
	SF ₆	-	-	-	-	-	-	-	-	-	-
Netherlands	HFC	5144	4863	4594	5107	6449	6724	7524	7884	8695	8836
	PFC	2432	2437	2099	2118	1890	1867	2042	2154	2469	2594
	SF ₆	145	100	106	110	148	174	160	182	132	137
Portugal	HFC	0	0	0	0	0	0	0	0	0	0
	PFC	0	0	0	0	0	157	157	157	157	157
	SF ₆	0	0	0	0	0	1	1	1	1	1
Spain	HFC	2894	2574	2869	2258	3885	5595	6412	6923	7015	9146
	PFC	828	787	782	794	785	790	759	784	750	696
	SF ₆	78	84	86	90	98	118	127	151	175	225
Sweden	HFC	1	3	4	17	47	94	141	239	303	375
	PFC	440	427	414	402	390	389	343	316	306	329
	SF ₆	81	82	82	88	97	115	103	146	92	96
United Kingdom	HFC	11374	11859	12346	12905	13814	15205	16290	18447	20183	6206
	PFC	2281	1790	959	811	980	1094	905	661	652	678
	SF ₆	724	776	833	889	1061	1134	1270	1263	1289	1314
Total	HFC	25,627	24,954	24,957	27,178	32,174	37,256	41,039	46,851	51,394	42,620
	PFC	13,502	11,847	9,606	8,232	7,524	7,825	7,761	7,414	7,979	8,361
	SF₆	8,283	8,965	9,651	10,431	11,284	11,917	11,711	11,701	11,221	11,076

Note (1): For Belgium values are given in italics where emission estimates have been taken from the most recent previous year.

Note (2): Emission estimates of hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) are given in global warming potentials (GWPs) in Annex A and B. For sulphur hexafluoride (SF₆) the GWP=23900 has been used to calculate CO₂ equivalent emissions (100 years time horizon).

3. Changes compared to the previous (2000) EC inventory

For the first time, a complete time series for the EU15 including F-gas emissions has been compiled, since the data availability of F-gas emissions has improved considerably. This year 12 Member States submitted complete time series on F-gas data compared to 6 Member States last year. For transparency reasons, Table 4 presents the data availability of F-gas emissions as submitted by the Member States and the EU totals for the whole time series.

Most Member States submitted revised and updated time series from 1990 to 1998. The revisions lead to minor changes (below 1 %) in EU total CO₂ emissions for 1990-1998. For CH₄ and N₂O the changes were slightly higher (up to 4 %) mainly due to methodological changes in the waste and agriculture sectors.

Annex A:
UNFCCC Summary Reports 1.A of the Common
Reporting Format for the European Community
(EU15)

EU15 1990

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

(Sheet 1 of 2)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO ₂ emissions	CO ₂ removals	CH ₄	N ₂ O	HFCs		PFCs		SF ₆		NO _x	CO	NMVOC	SO ₂
						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				11,782		0.1	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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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													

Notes:

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.
Category 5 "Land-Use Change and Forestry" provides "net" emissions (Member States emissions minus Member States removals) of CO₂ following CRF recommendations..

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
 (Sheet 1 of 2)

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		3,350,679	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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).

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

(Sheet 1 of 2)

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		3,277,471	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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).

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
 (Sheet 1 of 2)

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		3,208,245	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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).

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

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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		3,220,706	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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
CO₂ Emissions from Biomass	141,829													

Notes:

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

(Sheet 1 of 2)

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		3,258,070	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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													

Notes:

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

(Sheet 1 of 2)

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		3,332,938	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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													

Notes:

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

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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		3,272,091	-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	3,755	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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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													

Notes:

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

(Sheet 1 of 2)

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		3,316,965	-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

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 2)

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													

Notes:

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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

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

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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		3,270,520	-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

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

Since not all Member States reported data on the Reference Approach for CO₂ from fossil fuel combustion, they are omitted in Annex A. Instead they are presented in Annex B.

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