II. SECTION I:

COMPARISON OF GREENHOUSE GAS INVENTORY INFORMATION ACROSS PARTIES

A. Overview

1. Introductory notes

General notes

This section of the synthesis and assessment report contains greenhouse gas (GHG) inventory information, compiled in tabular format, from the 23 Annex I Parties, hereinafter referred to as Parties that provided information in the common reporting format (CRF) as part of their annual inventory submission in 2000. The tables provide comparisons of implied emission factors and activity data as reported in the CRF, data from international sources, emissions, information on methods used and emission factors as reported by Parties in Summary table 3 of the CRF and other information related to GHG inventory estimates. Where possible this information is provided for all 23 Parties and for all years in the period 1990 to 1998. For some sectors/categories, however, trend comparisons across all Parties were not possible due to the lack of data for some or all of these years (see section on status of reporting inventories in the year 2000, page 9).

Some of the tables indicate whether a source category is a key source, in terms of its absolute level of emissions, as calculated by the secretariat in accordance with the definitions given in Chapter 7 of the IPCC good practice guidance[12] for the Tier 1 level assessment.[13] This is indicated by an "L" for level in the columns 'key source'. The column "Per cent of national total" indicates the contribution of that key source category to the Party's national total of GHG emissions in terms of CO_2 equivalent excluding emissions and removals from land-use change and forestry.

Default emission factors and other parameters from the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, have been included in the tables, as appropriate, to facilitate comparison with implied emission factors reported by Parties. In addition, where updated default emission factors were available from the IPCC good practice guidance, these have been provided in the relevant footnotes.

Explanatory notes

Blank cells in the tables indicate that a Party did not report information for a given source and gas in the appropriate table of the CRF.

The differences in activity data between the CRF and international data sources were calculated as percentage deviations from the activity data in the CRF. A positive number indicates that the

[12] Good practice guidance refers to the IPCC report "Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories".

[13] Emissions and removals from land-use change and forestry have not been included in the calculations for the identification of key sources.

data from the international data source are higher than the data reported in the CRF. Similarly, a negative number indicates that data from the international data source are lower than the data reported in the CRF.

Where Parties used indicators (NO, NE, NA, IE, C, 0) these have been reproduced verbatim from the CRF tables provided by Parties. The standard indicators, as described in the UNFCCC reporting guidelines (FCCC/CP/1999/7), are as follows:

NO	Not occurring
NE	Not estimated
NA	Not applicable
IE	Included elsewhere
C	Confidential
"0"	Estimates that are less than one half the unit being used to record the inventory table

To indicate the methods and emission factors used by Parties the following abbreviations have been used (see also footnotes to Summary table 3 of the CRF):

Methods:		Emission factors:	
D	IPCC default	D	IPCC Default
RA	Reference approach	C	CORINAIR
T1	IPCC Tier 1	CS	Country Specific
T1a, T1b, T1c	IPCC Tier 1a, Tier 1b, and Tier 1c, respectively	PS	Plant Specific
		M	Model
T2	IPCC Tier 2		
T3	IPCC Tier 3		
C	CORINAIR		
CS	Country Specific		
M	Model		

Tables on energy indicate whether implied emission factors given in the CRF are based on gross calorific value (GCV) or net calorific value (NCV). The difference between the NCV and the GCV for each fuel is the latent heat of vaporization of the water produced during combustion of the fuel. For coal and oil, NCV is 5 per cent less than GCV, and for most forms of natural and manufactured gas the difference is 9 to 10 per cent.

For greenhouse gases the following chemical symbols and abbreviations have been used:

CF_4	perfluoromethane
C_2F_6	perfluoroethane
C_3F_8	perfluoropropane
C_4F_{10}	perfluorobutane
c-C_4F_8	perfluorocyclobutane
C_5F_{12}	perfluoropentane
C_6F_{14}	perfluorohexane
CH_4	methane
CO_2	carbon dioxide
HFCs	hydrofluorocarbons

N_2O	nitrous oxide
PFCs	perfluorocarbons
SF_6	sulphur hexafluoride

The following units have been used:

kg	kilogram (10^3 grams)
t	tonne (10^6 grams)
kt	kilotonne (10^9 grams)
Gg	gigagram (10^9 grams)
Mt	megatonnes (10^{12} grams)
TJ	Terajoule (10^{12} joules)
PJ	Petajoule (10^{15} joules)
Gg CO_2 equ	Gg of CO_2 equivalent
ha	hectare

The following other abbreviations have been used:

CRF	common reporting format
NIR	National Inventory Report
A	actual emissions
P	potential emissions
AD	activity data
EF	emission factor
IEF	implied emission factor
GHG	greenhouse gas
GWP	global warming potential
N	nitrogen
NCV	net calorific value
GCV	gross calorific value
yr	year
L	level (key source applying the IPCC good practice tier 1 level assessment)

2. Status of reporting GHG inventories in the year 2000

Inventories from Annex I Parties submitted in 2000 in accordance with decision 3/CP.5

- Parties that have submitted their inventories using the CRF were:

Australia, Austria, Belgium, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Netherlands, New Zealand, Norway, Slovakia, Spain, Sweden, Switzerland, the United Kingdom and the United States of America.

Table 1. Status of reporting inventories in the CRF:[14]

Reporting	Parties
Parties that have submitted complete inventories using the CRF for all years (1990-1998)	❑ Australia ❑ Japan ❑ New Zealand ❑ United Kingdom ❑ USA
Parties that have submitted complete inventories using the CRF for one or more years	❑ Austria (1998, all tables) ❑ Bulgaria (1998, all tables) ❑ Canada (1990 and 1998, all tables) ❑ Czech Republic (1998, almost all tables) ❑ Finland (1990 and 1998, all tables) ❑ Greece (1998, all tables) ❑ Hungary (1998, all tables) ❑ Ireland (1998, all tables) ❑ Norway (1998, almost all tables) ❑ Slovakia (1998, almost all tables) ❑ Sweden (1998, almost all tables) ❑ Switzerland (1998, all tables)
Parties that have submitted partial inventory data using the CRF for one or more years	❑ Belgium (1995-1998, limited number of tables) ❑ Greece (1990-1997, limited number of tables) ❑ Italy (1998, approximately two-thirds of all tables) ❑ Latvia[15] (1998, more than two-thirds of all tables) ❑ Lithuania (1998, approximately two-thirds of all tables) ❑ Netherlands (1990-1998, not all sectoral background data tables) ❑ Spain (1990-1998, limited number of tables) ❑ European Community (1990-1998, Summary tables)

- ❑ Parties that submitted a GHG inventory in 2000 but did not use the CRF were: Denmark, European Community[16], France, Germany, Iceland, Monaco, Poland, Portugal and the Russian Federation.

- ❑ Parties that did not submit an inventory in 2000 were: Croatia, Estonia, Liechtenstein, Luxembourg, Romania, Slovenia and the Ukraine.

[14] CRF tables provided by each Party can be found in the status reports on the UNFCCC secretariat web site: http://www.unfccc.int/resource/ghg/statrep2000.html

[15] In the initial inventory submission of Latvia approximately half of the tables of the CRF were reported. After receiving the draft synthesis and assessment report, Latvia submitted a revised version of the CRF for 1998, which includes corrections to the initially submitted data and shows a higher degree of completeness as for number of tables reported. It should however be noted, that information and data presented in section I of the synthesis and assessment report refers to the CRF as originally submitted. In the preliminary findings on individual national GHG inventories (section II) the revised CRF has been taken into account, as appropriate.

[16] The European Community, however, provided summary tables in the CRF.

Table 2. Provision of national inventory report (NIR) or any other additional information together with the CRF:

Reporting	Parties	Description
Parties that provided a NIR[17]	Australia	The report includes worksheets with activity data, emission factors and other parameters used for the calculation of emission estimates, and uncertainty estimates for all sectors. In addition, methodological supplements, including modifications and additions to previously published workbooks for fuel combustion activities, fugitive fuel emissions and waste, have been provided.
	Canada	The report provides information on methodologies, activity data and emission factors used for all source categories. In addition, uncertainty estimates (rounding protocol), verification and QA/QC procedures used are described.
	Greece	The report provides information on methodologies, activity data and emission factors used for some source categories and information on differences compared to previous submissions. Although estimates of emissions and removals from the Land-Use Change and Forestry sector have not been reported in the CRF, preliminary data from this sector are provided in the report.
	Netherlands	The report provides partial information on overall uncertainty estimates and on differences compared to previous submissions.
	New Zealand	The report provides information on methodologies, activity data, emission factors, differences compared to previous submissions and uncertainty estimates in the calculations for all source categories.
	Norway	The report provides a description of verification procedures and general information on methods used. References to methodologies, emission factors, activity data and measurements are included.
	United Kingdom	The report provides information on methodologies, activity data, emission factors, differences compared to previous submissions and uncertainty estimates in the calculations for all source categories.
	United States	The report provides information on methodologies, activity data, emission factors, differences compared to previous submissions and uncertainty estimates for all source categories.
Parties that did not provide a NIR, but provided additional information	Austria	Methods used and activity data have briefly been indicated.
	Finland	A brief description of the methodologies used for the compilation of the inventory has been provided. (The secretariat was informed that a NIR will be submitted together with the GHG inventory for 1999).
	Hungary	General information on methodologies, sources of activity data and emission factors for all sectors has been provided. In addition, differences compared to previous inventory submissions and problematic elements in compiling the inventory have been discussed.

[17] National Inventory Reports differ in content, scope and level of detail. The secretariat did not assess to what extent the information provided in the reports follows the reporting guidelines on this matter (see FCCC/CP/1999/7, pages 11–12, paragraphs 32-34).

	Ireland	Explanation of the major changes made in the inventory since the previous submission (1998).
	Spain	Explanatory notes to the CRF, including information on "forest and other woody biomass stocks," and basic calculations for this category have been provided.
	Sweden	Additional information on methodologies, activity data and emission factors used for fuel combustion has been provided.
Parties that did not submit any information in addition to that in the CRF	Belgium Bulgaria Czech Republic Italy Japan Latvia Lithuania Slovakia Switzerland	

For details regarding the degree of completeness and the timeliness in reporting please refer to the Status reports on the UNFCCC web site:
http://www.unfccc.int/resource/ghg/statrep2000. html

3. Summary of key sources

Table 3. Summary of key sources – Tier 1 level assessment (disaggregation level of sources as recommended in IPCC Good Practice Guidance)

Note that Belgium, Latvia and Spain are not included in this table because data from these Parties were not reported with the necessary level of detail as to allow the identification of key sources according to the level of disaggregation recommended by the IPCC Good Practice Guidance.

Source	GHG	Parties	Total Parties
Mobile combustion - Road vehicles	CO_2	Australia, Austria, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Lithuania, Netherlands, New Zealand, Norway, Slovakia Sweden, Switzerland, United Kingdom, United States	20
CH_4 from Enteric Fermentation in Domestic Livestock	CH_4	Australia, Austria, Bulgaria, Canada, Czech Republic, Finland ,Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, New Zealand, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States	19 (all except Japan)
CO_2 Stationary combustion - gas	CO_2	Australia, Austria, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Lithuania, New Zealand, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States	19 (all except Netherlands)
CO_2 Stationary combustion - oil	CO_2	Australia, Austria, Bulgaria, Canada, Czech Republic, Finland Greece, Hungary, Ireland, Italy, Japan, Lithuania, New Zealand, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States	19 (all except Netherlands)
CH_4 from Solid Waste Disposal Sites	CH_4	Australia, Austria, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, New Zealand, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States	19 (all except Japan)
CO_2 Stationary combustion - coal	CO_2	Australia, Austria, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Lithuania, New Zealand, Norway, Slovakia, Sweden, United Kingdom, United States	18 (all except Netherlands and Switzerland)
Agricultural soils - Direct N_2O emissions	N_2O	Australia, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Lithuania, New Zealand, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States	17 (all except Austria, Japan, Netherlands)
CO_2 from Cement production	CO_2	Austria, Bulgaria, Canada, Czech, Republic, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Norway, Slovakia, Sweden, Switzerland, United Kingdom	15
Agricultural soils - Indirect N_2O from Nitrogen used in Agriculture	N_2O	Bulgaria, Canada, Czech Republic, Finland, Hungary, Ireland, Italy, New Zealand, Norway, Sweden, Switzerland, United Kingdom, United States	13
Fugitive emissions: oil and gas operations	CH_4	Australia, Bulgaria, Canada, Hungary, Italy, Lithuania, Netherlands, Norway, Slovakia, United Kingdom, United States	11
Fugitive emissions: coal mining and handling	CH_4	Australia, Bulgaria, Czech Republic, Hungary, New Zealand, Slovakia, United Kingdom, United States	8

Source	GHG	Parties	Total Parties
Mobile combustion - aircraft	CO_2	Australia, Canada, Finland, Greece, New Zealand, Norway, Sweden, United States	8
Agricultural soils - Animal Production	N_2O	Australia, Greece, Ireland, Italy, New Zealand, Sweden, United Kingdom	7
Mobile combustion - Road vehicles	N_2O	Austria , Canada, Italy , Sweden, Switzerland, United Kingdom, United States	7
N_2O from Nitric Acid production	N_2O	Bulgaria, Czech Republic, Finland, Ireland, Lithuania, Norway, Sweden	7
Mobile combustion - Other Transportation	CO_2	Bulgaria, Canada, Finland, Netherlands, Norway, Sweden, United States	7
Fugitive emissions: oil and gas operations	CO_2	Australia, Austria, Canada, New Zealand, Norway, United Kingdom	6
CH_4 from Manure Management	CH_4	Austria, Canada, Hungary, Ireland, Italy, United States	6
CO_2 Stationary combustion - Other Fuels	CO_2	Finland, Italy, Netherlands, Slovakia, Sweden, Switzerland	6
CO_2 from Iron and Steel industry	CO_2	Austria, Bulgaria, Canada, New Zealand, United Kingdom, United States [b]	6
Mobile combustion-waterborne navigation	CO_2	Greece, Japan, Norway, Sweden, United States	5
Wastewater handling	CH_4	Bulgaria, Hungary, Italy, Slovakia	4
N_2O from Manure Management	N_2O	Canada, Italy, Sweden, Switzerland	4
Consumption of Halocarbons and SF6 (aggregate)	HFCs	Austria, Japan (P), Netherlands [a], Sweden (P)	4
Limestone and Dolomite Use	CO_2	Japan, Lithuania, Slovakia	3
Waste Incineration	CO_2	Hungary, Japan, Switzerland	3
N_2O from Adipic Acid production	N_2O	Canada, Italy, United Kingdom	3
Ammonia production	CO_2	Ireland, Lithuania, Norway	3
Consumption of Halocarbons and SF6 (aggregate)	SF_6	Austria, Japan (P), Sweden (P)	3
Aluminium Production	CO_2	New Zealand, Norway	2
PFCs from aluminium production	CF_4+C_2F_6	Canada, Norway	2
Non - CO_2 Stationary combustion - Biomass	N_2O	Finland, Sweden	2
Non - CO_2 Stationary combustion - oil	N_2O	Greece, Italy	2
Industrial processes – Other	CO_2	Canada, Sweden	2

Source	GHG	Parties	Total Parties
Agricultural soils	CH_4	Austria, Greece	2
Consumption of Halocarbons and SF6 (aggregate)	PFCs	Japan (P), Netherlands	2
CH_4 from Savanna Burning	CH_4	Australia	1
N_2O from Savanna Burning	N_2O	Australia	1
Mobile combustion - Railways	CO_2	Canada	1
Non - CO_2 Stationary combustion - coal	N_2O	Bulgaria	1
SF_6 from Magnesium production	SF_6	Norway	1
HFC - 23 from HCFC production	HFC-23	Greece	1
Carbide Production	CO_2	Norway	1
Ferroalloys Production	CO_2	Norway	1
Fugitive emissions from solid fuels - Other	CO_2	Finland	1
Industrial processes - Other	N_2O	Netherlands	1
Agricultural soils - Other	N_2O	Austria	1
Agricultural soils	CO_2	Finland	1
Solid waste disposal	CO_2	Netherlands	1
Other (sector 7)	CO_2	Finland	1
Production of Halocarbons and SF6	HFCs	United Kingdom	1
Agricultural soils (aggregated)	N_2O	Netherlands	1
Non - CO_2 Stationary combustion - Other Fuels	N_2O	Finland	1
ODS substitutes	HFCs+PFCs	United States	1

P: Potential emissions

[a] The Netherlands reported aggregate HFCs from its total Industrial processes sector, without disaggregation into source categories.

[b] The United States reported CO_2 from iron & steel in the Industrial processes sector for information purposes only because emissions were included in the Energy sector. This source category has, however, been considered in the key sources analysis.

D. Comparison of GHG emission estimates with previous submissions / recalculations

Table 4. Comparison of base year GHG emission estimates reported in the 2000 inventory submission with data reported in previous submissions/ recalculations

	Percentage changes in base year estimates in the 2000 inventory submission relative to those of the 1999 submission									Percentage changes in base year estimates over those in previous inventory submissions					
	Data based on information provided in table 8(a) of the CRF[a]					Data based on estimates for each GHG as reported in the 1999 and 2000 submissions[b]				1999 submission relative to that of the NC2			NC2 relative to that in the NC1		
	CO_2[c] %	CH_4 %	N_2O %	PFCs %	Aggregate GHGs[c] CO_2 equ	CO_2[c] %	CH_4 %	N_2O %	Aggregate GHGs[c] CO_2 equ		Aggregate GHGs[c] CO_2 equ			Aggregate GHGs[c] CO_2 equ	
	A	B	C	D	E	F	G	H	I		J			K	
Australia	1.21	-1.26	-1.59	-0.33	0.4	1.21	-1.26	-1.57	0.4		2.8			-7.7	
Austria						0.14	16.92	0.15	2.3		-5.3			6.1	
Belgium											-1.8			2	
Bulgaria[d]	7.20	-5.59	164.16		15.4	-0.32	-0.73	160.28	11.6						
Canada	1.07	0.75	9.97		1.8	0.98	1.19	12.53	2.1		5.9			0.2	
Czech Republic											-1.2			-0.4	
Finland	-0.14	0.74	0.76		3.6	2.65	-18.65	43.22	3.7		12.3			2.8	
Greece						-0.11	2.99	-0.68	0.1		4.7			6.3	
Hungary															
Ireland															
Italy						-0.01	-19.12	0.00	-2.8						
Japan											-1.3			-0.7	
Latvia															
Lithuania															
Netherlands						0.00	0.00	2.97	0.3		0.8			0.5	
New Zealand	0.71	5.93	1.64			0.62	0.00	3.03	0.8		-5.5			3.3	
Norway	-0.16	-0.74	-4.86	19.10	0.2	-0.16	-0.71	-2.08	-0.5		-4.3			7.2	
Slovakia						2.79	-6.68	73.71	4.7						
Spain	-0.16	-24.41	41.21			-0.16	-24.41	41.21	0.2		-			0	
Sweden						0.00	0.03	-0.87	-0.1		6.7			-10.3	
Switzerland	-1.41	-0.59	-1.12		-1.2	-1.47	-0.66	-1.37	-1.4						
United Kingdom	0.01	1.10	-0.64	0	0.1	0.01	1.10	-0.64	0.1		1.7			1.2	
United States						-0.30	4.70	12.99	1.0		3.3			1.3	

NC1: First national communication NC2: Second national communication

Notes:

Values given in this table denote the percentage change in the inventory estimates of the latest annual inventory submission relative to the previously submitted inventory.

Columns J and K are reproduced from working paper No. 6 "Effects of recalculations of greenhouse gas inventories on assigned amounts and on emission limitation and reduction commitments of Annex I Parties" (see http://www.unfccc.int/sessions/workshop/000314/wp6.pdf). They show the percentage change in aggregate base year GHG emissions as provided in the 1999 inventory submission relative to aggregate GHG emissions as provided in the NC2, and of the estimates of the NC2 compared to the NC1.

Note that HFCs, PFCs and SF_6 are not included in the aggregate GHG emission estimates presented in this table. However, for Parties that reported HFCs, PFCs and SF_6 in the Recalculation table 8(a) of the CRF for 1990, these gases might be included in the aggregate GHG emission estimates of column E. Recalculations for HFCs and SF_6 for the base year have not been reported by any Party. However, in the case of New Zealand, estimates for SF_6 were reported in the 2000 submission but not in the previous submission, according to table 8(a). In the case of Spain, emission estimates for HFCs, PFCs and SF_6 were provided in the 2000 submission for the first time.

This table was prepared following the approach that was used to prepare table 11 of document FCCC/SBSTA/1998/7 (pp. 30-31). Information on how the percentage changes were calculated can be found in that document. Negative values denote that the latest submitted inventory has a lower figure.

[a] Percentage changes for each gas are reproduced in this part of the table as reported by Parties in Table 8(a)s1 of the CRF. For Parties that did not report the percentage change for the national totals for each gas (Finland, New Zealand), the secretariat calculated the percentage change on the basis of data reported by Parties in table 8(a) of the CRF for 1990. The percentage change in aggregate GHG emissions is given in this part of the table as reported by the Party in table 8(a)s2 of the CRF.

[b] Percentage changes were calculated by the secretariat using inventory data as provided in the respective tables of the 2000 submission compared to inventory data as provided in the 1999 inventory submission. In principle, values presented in column I should correspond to those given in column E.

[c] Excluding land-use change and forestry.

[d] In accordance with decision 9/CP.2, Bulgaria uses 1988 as its base year which is given in this table.

B. SECTORAL TABLES

1. Energy

Energy - Total CO_2 emissions from the Reference approach and the Sectoral approach (1998)

	CO_2 emissions from Total Fuel Combustion			
	Sectoral approach	Reference approach	Difference	Explanation for difference as reported in table 1A(c) of the CRF
	Gg		%	
Austria	51,389	63,043	22.68	CORINAIR is used as national method, considering the following items of the official Austrian energy balance (in German): "Energetischer Endverbrauch", "Umwandlungseinsatz" , "Verbrauch des Sektors Energie". Differences between national estimates and reference approach include: **Solid fuels:** Energy consumption: National approach doesn't include transformation losses of coking coal to coke oven gas and coke. CO_2 emissions: The national approach doesn't separate between fuel related and non-fuel related CO_2 emissions for metal production. All CO2-emissions are included in sector 2C: Metal Production. **Gaseous fuels:** Energy consumption: National approach doesn't include losses and non-energy-use. CO2 emissions: National approach uses sector specific carbon contents (different from IPCC reference factor). **Liquid fuels:** Energy consumption: National approach doesn't include non-energy use and energy losses. CO2 emissions: Heat values and carbon contents are sector and fuel specific. The energy statistic is mass balanced only. **Other fuels:** The national approach considers waste as an additional fuel type (= municipal and industrial waste, sludge). 90 % of CO2 emissions from waste-burning are considered biogenic.
Belgium [a]	114,623			
Canada	476,426	526,515	10.51	This comparison as programmed in the CRF is not suitable for the Canadian Inventor since the national approach does not include fossil fuel based CO2 from various industrial processes such as ammonia and aluminum production. When these sources are included in the national approach's totals for energy, the two match quite closely. 476426.48 + 29705.01 = 506131.49 which represents a 4% difference.
Hungary	54,621	56,641	3.70	876-67,585-18,942=789,47 Total-Non energy-Leak=National Appr.
Ireland	37,707	39,310	4.25	The difference is due largely to the inclusion of 19.26 PJ of natural gas in the Reference Approach which is used in Industry Feedstocks and therefore omitted from the National Approach. This accounts for 85 percent of the difference (3.68 out of 4.35).
Latvia [a]	8,051			
Lithuania	13,982	15,615	11.68	*No explanation provided.*
Norway	31,644	32,371	2.30	Sum statistical differences in 1998: 3400 ktonnes CO_2. Combustion of waste, not included in reference approach: about 120 ktonnes CO2. Landfill gas, not included in reference approach. Combustion of hazardous waste apart from waste oil is not included in reference approach (43 ktonnes CO_2). Due to the high production of crude oil and natural gas in Norway, small inaccuracies in data and conversion factors will have large effect on CO_2 emissions estimated by reference approach. Reference approach also includes carbon emitted as CO_2 accounted for in 'Fugitive missions from Fuels'. This is approximately 700 Gg (as flared natural gas is subtracted from Reference Approach). When this is accounted for the difference is less than 0.00 per cent. 'Other': Cell formula E12 has been altered in order to sum emission figures up to the Norwegian national total (includes emissions from combustion of methane)
Slovakia	39,001	39,953	2.44	*No explanation provided.*
Spain [b]				
Sweden	52,718	60,059	13.92	An explanation for the difference between the two approaches was not provided in Table 1A(c). However, Sweden provided the following explanatory information in its submission: Data reported in the reference approach is gross supply of fuel in the country. The reference approach is based on the energy balance where data on import/export is collected from statistics on foreign trade (coal and coke) and from the oil trade (oil products). Production of fuels (biomass, peat etc.) is considered the same as the use in the industry and energy sectors. Data on stock change includes statistical differences due to surveys of different sources. The conversion to TJ is based on data on net calorific values from the individual source of information. Data reported in the sectoral approach is the fuel use in different sectors. The sectoral approach is based on surveys of use of fuel as total from the energy sector and selected industries. Included in table 1A(b) are some uses of energy that are not included in table 1A(a). - The use of fuel for non energy purposes (the emissions from non energy use are included in the industry sector) - Transmission losses, mainly in refineries - International bunkers for aviation: Statistics Sweden does not have a method for excluding these in the energy balance. International aviation bunkers are therefore included in the reference approach. - The use of oil in gas works and the use of petroleum coke

Energy - Total CO_2 emissions from the Reference approach and the Sectoral approach (1998)

	CO_2 emissions from Total Fuel Combustion			
	Sectoral approach	Reference approach	Difference	Explanation for difference as reported in table 1A(c) of the CRF
	Gg		%	
United Kingdom	522,888	547,294	4.67	A significant proportion of fuel consumption emissions occur in 1B1b Solid Fuel Transformation, 2C Metal Production and 2B1 Ammonia Production. Including these sources with 1A in the comparison reduces the discrepancy to 3.2%. This discrepancy arises from three sources: (I) The statistical difference between 'apparent consumption' used in the reference inventory and actual consumption used in the sectoral inventory. This statistical difference results from losses and errors in the estimates. (2) The sectoral inventory includes emissions from the non-energy use of fuel where they can be specifically identified e.g. catalytic crackers, iron & steel, lubricants combustion and ammonia production. The reference approach implicitly treats the no energy use of fuel as if it were combustion. A correction is then applied by deducting an estimate of carbon stored from non-energy fuel use. The carbon stored is estimated from an approximate procedure which does not identify specific processes. The result is that the reference approach is based on a higher estimate of non-energy use emissions than the sectoral inventory. (3) The reference approach uses data on primary fuels such as crude oil and natural gas liquids which are then corrected for imports, exports and stock changes of secondary fuels. Thus the estimates obtained will be highly dependent on the default carbon contents used for the primary fuels. The sectoral approach is based wholly on the consumption of secondary fuels where the carbon contents are known with greater certainty. In particular the carbon contents and calorific values of the primary liquid fuels are likely to vary more than those of secondary fuels.
United States (1) [c]	5,383,502	4,550,400	-15.48	The energy consumption and CO2 emissions from the reference approach are 2.13 % and 15.48% lower than the national approach on the basis of table 1.A(b) and table 1.A(a) of the CRF. However, in Annex O of the National Inventory Report (NIR) the energy consumption is 2.0% lower in the reference approach and CO2 emissions from the reference approach are 0.8% higher than the national approach. In Annex O reasons given for difference include product definitions, data inconsistencies (more accurate consumption data), and carbon coefficients (default vs category-specific). Detailed explanations of results are provided in Annex O of the NIR. The reasons for the differences in the information presented in the NIR and the CRF need to be looke at closer.
United States (2) [c]	5,383,502	5,426,300	0.8	

Notes:
Parties for which the difference in CO2 emissions between the Reference and the Sectoral approach were less than 2 per cent have not been included in this table.

Only Parties that report a difference higher than 2 per cent are required to provide an explanation.

[a] No reporting of tables 1A(a), 1A(b) and 1A(c) of the CRF.
[b] No reporting of tables 1A(a), 1A(b) and 1A(c) of the CRF for 1998. The Reference approach (table 1A(b)) was, however, provided for 1990 to 1996.
[c] The two values given in this table refer to (1) the estimate from the Reference approach as provided in the CRF and (2) a modified reference approach which has been provided separately because of differences in the fuel categories between the IPCC

Energy - Stationary Combustion: liquid fuels (1998)

	Stationary Combustion - Liquid fuels (CO_2)																	
				1.A.1 Energy Industries						1.A.2 Manufacturing industries and construction			1.A.4 Other sectors					
	Keysource	percent of national total	IEF in CRF based on	Methods and EF used [c]		CO_2 IEF				Methods and EF used [d]		CO_2 IEF	Methods and EF used [e]		CO_2 IEF			
				Methods	EF	Total	Public electricity and heat production	Petroleum refining	Manufacture of solid fuels and other energy industries	Methods	EF	Total	Methods	EF	Total	Commercial/ Institutional	Residential	Agriculture/ Forestry/ Fisheries
		(%)				(t/TJ)						(t/TJ)			(t/TJ)			
Australia	L	6.0	GCV	T2	CS	68.3	69.1	67.9	69.0	T2	CS	67.6	T1, T2	CS	66.6	61.8	63.1	68.8
Austria	L	15.6	NCV	C	CS	51.0	79.2			C	CS	63.4	CS	CS	74.7	75.2	74.7	74.2
Belgium [a]																		
Bulgaria	L	7.5	NCV	T3	CS, D	4.8	73.1	1.7	76.6	T2	CS, D	76.2	T2	CS, D	73.4	74.0	66.8	74.7
Canada	L	10.1	GCV	T1	CS	68.1	73.0	65.4	70.4	T1	CS	46.3	T1	CS	85.3	96.1	78.7	92.1
Czech Republic	L	7.7	NCV	T1	D	74.8	75.7	74.1	72.9	T1	D	63.9	T1	D	68.7	71.1	63.8	73.0
Finland	L	19.2	NCV	CS (T2)	CS/PS/D	73.1	76.4	71.5		CS (T2)	CS/PS/D	73.5	CS (T2, T1)	CS/D	73.6	74.0	73.4	73.7
Greece	L	21.1	NCV	C	C and CS	75.3	75.5	74.8	NO	C	C	64.5	C	C	72.8	71.9	72.8	72.9
Hungary	L	10.5	NCV	D	D	76.5	76.6	75.8	75.8	D	D	75.8	D	D	67.9	66.9	62.1	73.1
Ireland	L	17.6	NCV	T1	PS, CS	76.0	76.1	74.1	NO	T1	PS, CS	74.0	T1	CS	72.6	73.8	71.3	73.3
Italy	L	23.8	NCV			76.5	76.6	74.6	79.2			78.3			73.4	73.5	73.5	73.2
Japan	L	29.8	NCV	T1, RA, CS	D, CS	69.3	NE	NE	NE	T1, RA, CS	D, CS	72.5	T1, RA, CS	D, CS	70.1	71.0	68.0	72.4
Latvia [a]																		
Lithuania	L	26.2	NCV	RA, T1	D	76.9	75.9	84.1	71.3	RA, T1	D	74.4	RA, T1	D	67.3	72.0	61.9	72.0
Netherlands [b]																		
New Zealand	L	3.4	NCV	T1	CS/D	73.6	68.7	74.8	NE	T1	CS/D	68.6	T1	CS/D	68.5	68.4	60.7	69.4
Norway	L	16.7	NCV	T2	CS	60.9	76.3	57.8	73.5	T2	CS	68.9	T2	CS	73.5	73.5	73.2	73.6
Slovakia	L	2.5	NCV			32.4	32.4								32.4	32.4	NA	
Spain [a]																		
Sweden	L	24.4	NCV	CS	CS	76.1	76.0	76.2		CS	CS	76.2	CS	CS	76.2	75.4	75.3	79.6
Switzerland	L	33.3	NCV	RA, C	RA, CS	76.6	76.4	77.0		C	CS	74.5	C	CS	73.7	73.7	73.7	73.7
United Kingdom	L	10.1	NCV	T2	CS	71.6	76.0	71.2	70.8	T2	CS	73.8	T2	CS	72.6	73.7	71.7	72.9
United States	L	10.4	GCV	T1	D, CS	73.8	73.8	IE	IE	T1	D, CS	38.6	T1	D, CS	66.4	68.2	65.6	IE

[a] This Party did not provide table 1A(a) of the CRF. An identification of key sources according to fuel types was therefore not possible.

[b] The Party did not report liquid fuels from stationary combustion.

[c] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "1.A.1 Energy industries".

[d] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "1.A.2 Manufacturing industries and construction.

[e] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "1.A.4 Other sectors".

Energy - Stationary Combustion: Solid fuels (1998)

	Stationary Combustion - Solid fuels (1998) (CO_2)																	
				1.A.1 Energy Industries					1.A.2 Manufacturing Industries and Construction			1.A.4 Other Sectors						
				Methods and EF used [c]		CO_2 IEF			Methods and EF used [d]		CO_2 IEF	Methods and EF used [e]		CO_2 IEF				
	Key source	percent of national total	IEF in CRF based on	Methods	EF	Total	Public electricity and heat production	Manufacture of solid fuels and other energy industries	Methods	EF	Total	Methods	EF	Total	Commercial/ Institutional	Residential	Agriculture/ Forestry/ Fisheries
		(%)				(t/TJ)					(t/TJ)			(t/TJ)			
Australia	L	38.5	GCV	T2	CS	90.5	91.1	72.3	T2	CS	97.1	T1, T2	CS	96.8	96.7	98.3	NA
Austria	L	9.1	NCV	C	CS	91.1	91.1		C	CS	9.7	CS	CS	93.7	95.6	93.4	
Belgium [a]																	
Bulgaria	L	37.7	NCV	T3	CS, D	77.9	107.5	2.5	T2	CS, D	97.3	T2	CS, D	99.7	97.8	99.7	100.0
Canada	L	15.3	GCV	T1	CS	91.8	91.7	111.0	T1	CS	29.3	T1	CS	88.4	56.7	88.7	
Czech Republic	L	57.0	NCV	T1	D	99.7	99.1	113.7	T1	D	107.1	T1	D	99.4	99.5	99.3	99.8
Finland	L	18.3	NCV	CS (T2)	CS/PS/D	91.2	92.7	39.7	CS (T2)	CS/PS/D	97.7	CS (T2, T1)	CS/D	93.1	100.0	93.0	93.1
Greece	L	35.5	NCV	C	C and CS	122.1	122.1	NO	C	C	94.0	C	C	100.8	NO	99.9	105.0
Hungary	L	18.5	NCV	D	D	96.3	96.1	103.0	D	D	103.0	D	D	94.0	95.2	93.8	95.9
Ireland	L	19.2	NCV	T1	PS, CS	94.7	94.7	NO	T1	PS, CS	97.5	T1	CS	99.4	100.6	99.4	NO
Italy	L	8.4	NCV			94.7	94.1	98.3			97.0			102.2	102.2	102.2	
Japan	L	24.2	NCV	T1, RA, CS	D, CS	97.6	NE	NE	T1, RA, CS	D, CS	100.1	T1, RA, CS	D, CS	104.4	104.7	101.0	
Latvia [a]																	
Lithuania	L	2.4	NCV	RA, T1	D	91.6	91.5	92.6	RA, T1	D	90.4	RA, T1	D	82.6	90.8	63.0	90.8
Netherlands [b]																	
New Zealand	L	4.1	NCV	T1	CS/D	93.0	93.0	NE	T1	CS/D	90.4	T1	CS/D	91.2	91.2	91.2	91.2
Norway	L	1.2	NCV	T2	CS	86.1	86.1		T2	CS	92.6	T2	CS	92.7		92.7	
Slovakia	L	32.1	NCV			97.1	97.1							97.1	97.1	97.1	
Spain [a]																	
Sweden	L	9.8	NCV	CS	CS	97.2	97.2		CS	CS	97.6	CS	CS	103.0			103.0
Switzerland			NCV	RA, C	RA, CS				C	CS	94.0	C	CS	94.3	95.0	94.3	
United Kingdom	L	20.6	NCV	T2	CS	88.0	88.0	89.4	T2	CS	129.7	T2	CS	90.1	87.2	90.5	89.3
United States	L	29.4	GCV	T1	D, CS	88.6	88.6	IE	T1	D, CS	87.6	T1	D, CS	89.5	89.5	89.5	IE

Note:
Finland and Italy also reported emissions from use of solid fuels for petroleum refining. The IEF reported in the CRF were 92.9 and 99.7 t/TJ, respectively.

[a] This Party did not provide table 1A(a) of the CRF. An identification of key sources according to fuel types was therefore not possible.

[b] The Party did not report solid fuels from stationary combustion.

[c] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "1.A.1 Energy industries".

[d] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "1.A.2 Manufacturing industries and construction.

[e] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "1.A.4 Other sectors".

Energy - Stationary Combustion: gaseous fuels (1998)

	Stationary Combustion - Gaseous fuels (CO_2)																		
				1.A.1 Energy Industries						1.A.2 Manufacturing Industries and Construction			1.A.4 Other Sectors					
				Methods and EF used [c]		CO_2 IEF				Methods and EF used [d]		CO_2 IEF	Methods and EF used [e]		CO_2 IEF			
	Key-source	percent of national total	IEF in CRF based on	Methods	EF	Total	Public Electricity and Heat Production	Petroleum Refining	Manufacture of Solid Fuels and other Energy Industries	Methods	EF	Total	Methods	EF	Total	Commercial/ Institutional	Residential	Agriculture/ Forestry/ Fisheries
		(%)				(t/TJ)						(t/TJ)			(t/TJ)			
Australia	L	8.7	GCV	T2	CS	51.2	51.7	50.6	50.7	T2	CS	50.7	T1, T2	CS	50.7	50.7	50.7	50.7
Austria	L	18.4	NCV	C	CS	55.0	55.0		55.0	C	CS	54.8	CS	CS	55.0	55.0	55.0	
Belgium [a]																		
Bulgaria	L	8.1	NCV	T3	CS, D	55.8	55.8	NO	55.8	T2	CS, D	55.8	T2	CS, D	55.8	55.8		55.8
Canada	L	18.4	GCV	T1	CS	42.2	49.2	49.2	38.9	T1	CS	32.7	T1	CS	49.2	49.2	49.2	49.2
Czech Republic	L	12.0	NCV	T1	D	55.8	55.8	55.8		T1	D	55.8	T1	D	55.8	55.8	55.8	55.9
Finland	L	10.5	NCV	CS (T2)	CS/PS/D	55.8	55.8	55.8		CS (T2)	CS/PS/D	55.7	CS (T2, T1)	CS/D	55.8	55.8	55.8	55.9
Greece	L	1.5	NCV	C	C and CS	55.8	55.8	NO	55.8	C	C	48.7	C	C	55.8	55.8	55.8	NO
Hungary	L	26.2	NCV	D	D	55.8	55.8	55.8		D	D	55.8	D	D	55.8	55.8	55.8	55.8
Ireland	L	8.6	NCV	T1	PS, CS	54.5	53.9	65.0	NO	T1	PS, CS	54.9	T1	CS	54.9	54.9	54.9	NO
Italy	L	26.0	NCV			69.9	67.3	67.2	85.7			58.4			56.4	56.4	56.4	56.4
Japan	L	10.2	NCV	T1, RA, CS	D, CS	54.8	NE	NE	NE	T1, RA, CS	D, CS	51.8	T1, RA, CS	D, CS	51.6	51.6	51.6	
Latvia [a]																		
Lithuania	L	14.3	NCV	RA, T1	D	57.3	55.7	65.4	55.5	RA, T1	D	55.5	RA, T1	D	55.5	55.5	55.5	55.5
Netherlands [b]																		
New Zealand	L	11.0	NCV	T1	CS/D	54.1	52.9	60.3	NE	T1	CS/D	33.3	T1	CS/D	52.4	52.4	52.4	NE
Norway	L	13.8	NCV	T2	CS	57.1			57.1	T2	CS	58.2	T2	CS				
Slovakia	L	25.0	NCV			57.5	57.5								57.5	57.5	57.5	
Spain [a]																		
Sweden	L	7.6	NCV	CS	CS	78.3	77.5	65.1	80.8	CS	CS	68.9	CS	CS	61.8	60.3	64.2	57.1
Switzerland	L	10.8	NCV	RA, C	RA, CS	57.5	55.0	59.3		C	CS	55.0	C	CS	55.0	55.0	55.0	55.0
United Kingdom	L	27.9	NCV	T2	CS	62.8	58.9	58.0	75.9	T2	CS	58.0	T2	CS	58.0	58.0	58.0	58.0
United States	L	16.3	GCV	T1	D, CS	50.0	50.0	IE	IE	T1	D, CS	48.2	T1	D, CS	50.0	50.0	50.0	IE

[a] This Party did not provide table 1A(a) of the CRF. An identification of key sources according to fuel types was therefore not possible.

[b] The Party did not report gaseous fuels from stationary combustion.

[c] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "1.A.1 Energy industries".

[d] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "1.A.2 Manufacturing industries and constr

[e] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "1.A.4 Other sectors".

Energy - Stationary Combustion: other fuels (1998)

	Stationary Combustion - Other fuels (CO_2)															
	Key-source	percent of national total	IEF in CRF based on	1.A.1 Energy Industries				1.A.2 Manufacturing Industries and Construction			1.A.4 Other Sectors					
				Methods and EF used		CO_2 IEF		Methods and EF used		CO_2 IEF	Methods and EF used		CO_2 IEF			
				Methods	EF	Total	Public Electricity and Heat Production	Methods	EF	Total	Methods	EF	Total	Commercial/ Institutional	Residential	Agriculture/ Forestry/ Fisheries
		(%)				(t/TJ)				(t/TJ)			(t/TJ)			
Australia						NA	NA			NA				NA	NA	NA
Austria			NCV					C	CS	8.3	CS	CS	10.0	10.0		
Belgium																
Bulgaria						NO	NO			NO						
Canada																
Czech Republic																
Finland	L	11.1	NCV	CS (T2)	CS/PS/D	103.8	103.8	CS (T2)	CS/PS/D	103.1	CS (T2, T1)	CS/D	104.9	104.9	105.0	104.9
Greece						NO	NO			NO				NO	NO	NO
Hungary																
Ireland			NCV	T1	PS, CS	54.9	54.9			NO				NO	NO	NO
Italy[a]	L	0.9	NCV			76.6	76.4			78.1			62.4	62.4	62.4	62.4
Japan						NO	NO			NO			NO	NO	NO	NO
Latvia																
Lithuania											RA, T1	D	76.1	235.7	71.9	72.0
Netherlands	L	60.1		CS	PS, CS			CS	PS, CS		CS	CS				
New Zealand						NO	NO			NO				NO	NO	NO
Norway			NCV	T2	CS	45.8	45.8									
Slovakia	L	4.9	NCV			57.5	57.5						57.5	57.5		
Spain																
Sweden	L	0.8	NCV	CS	CS	32.7	32.7	CS	CS	28.4						
Switzerland	L	5.0	NCV					C	CS	76.0	C	CS	73.7			73.7
United Kingdom			NCV	T2	CS	36.6	36.6	T2	CS	94.3						
United States			GCV	T1	D, CS	7.1	7.1			IE				NE	NE	IE

Note

This table is provided for the purpose of completeness. Parties reported emissions and activity data from different fuels under "Other fuels" in the CRF and, consequently, the CQ IEFs may not be comparable.

[a] Italy also reported emissions from the use of other fuels for petroleum refining and manufacture of solid fuels and other energy industries (IEF: 79.37 and 76.46 t/TJ, respectively).

Energy - Energy Industries (all fuels):

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year [(a)]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		141,807	145,297	148,513	149,791	150,851	156,807	163,335	169,404	187,222
Austria		12,377	13,400	9,808	9,133	9,395	10,922	11,418	11,883	11,642
Belgium									27,876	27,287
Bulgaria	37,823	39,664	37,626	34,127	34,632	31,574	32,246			27,521
Canada		144,599	143,299	151,415	145,494	148,411	154,328	154,517	162,941	181,201
Finland		18,513	NE	17,428	19,849	24,526	22,262	27,819	24,414	21,395
Greece		43,658	42,526	44,902	45,320	47,111	47,107	45,287	48,614	50,612
Hungary	36,928	29,746	28,520	27,476	27,575	26,290	26,431	26,610	26,537	24,161
Ireland		11,057	11,546	12,224	12,233	12,749	13,239	13,959	14,643	15,047
Italy		142,927	137,489	137,592	127,476	129,069	140,299	134,219	135,346	154,457
Japan		338,908	341,967	349,458	331,667	369,322	359,370	360,447	356,849	347,918
Netherlands		52,550	52,190	54,130	53,800	55,980	56,040	57,000	56,100	58,500
New Zealand		6,079	6,151	7,628	6,598	5,457	4,728	5,367	6,944	5,262
Norway		7,382	7,574	8,386	8,751	9,294	9,044	9,938	10,419	10,025
Slovakia		51,621	45,949	41,551	39,691	36,471	37,688	38,330	37,079	35,003
Spain		74,783	75,028	83,033	77,114	78,029	83,568	71,307	83,658	79,161
Sweden		8,849	9,973	10,592	10,681	11,068	10,493	14,295	9,600	9,728
Switzerland		891	1,201	1,280	962	1,039	1,094	1,267	1,176	1,423
United Kingdom		229,142	227,148	217,139	200,476	198,016	199,388	198,949	184,883	189,846
United States		1,747,763	1,735,235	1,733,398	1,798,604	1,811,270	1,811,566	1,881,158	1,953,876	2,016,379

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	2.5	2.2	0.9	0.7	3.9	4.2	3.7	10.5	32.0
Austria	8.3	-26.8	-6.9	2.9	16.3	4.5	4.1	-2.0	-5.9
Belgium								-2.1	
Bulgaria	-5.1	-9.3	1.5	-8.8	2.1				-27.2
Canada	-0.9	5.7	-3.9	2.0	4.0	0.1	5.5	11.2	25.3
Finland			13.9	23.6	-9.2	25.0	-12.2	-12.4	15.6
Greece	-2.6	5.6	0.9	4.0	0.0	-3.9	7.3	4.1	15.9
Hungary	-4.1	-3.7	0.4	-4.7	0.5	0.7	-0.3	-9.0	-34.6
Ireland	4.4	5.9	0.1	4.2	3.8	5.4	4.9	2.8	36.1
Italy	-3.8	0.1	-7.4	1.2	8.7	-4.3	0.8	14.1	8.1
Japan	0.9	2.2	-5.1	11.4	-2.7	0.3	-1.0	-2.5	2.7
Netherlands	-0.7	3.7	-0.6	4.1	0.1	1.7	-1.6	4.3	11.3
New Zealand	1.2	24.0	-13.5	-17.3	-13.4	13.5	29.4	-24.2	-13.4
Norway	2.6	10.7	4.4	6.2	-2.7	9.9	4.8	-3.8	35.8
Slovakia	-11.0	-9.6	-4.5	-8.1	3.3	1.7	-3.3	-5.6	-32.2
Spain	0.3	10.7	-7.1	1.2	7.1	-14.7	17.3	-5.4	5.9
Sweden	12.7	6.2	0.8	3.6	-5.2	36.2	-32.8	1.3	9.9
Switzerland	34.8	6.6	-24.8	8.0	5.3	15.8	-7.2	21.0	59.7
United Kingdom	-0.9	-4.4	-7.7	-1.2	0.7	-0.2	-7.1	2.7	-17.1
United States	-0.7	-0.1	3.8	0.7	0.0	3.8	3.9	3.2	15.4

Note:
The Czech Republic, Latvia and Lithuania are not included in this table because data for years other than 1998 were not reported.

Energy - Manufacturing Industries and Construction (all fuels):

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		50,029	49,405	47,228	47,423	48,180	51,144	52,159	51,387	51,346
Austria		7,434	6,815	6,949	6,849	6,661	7,510	7,852	8,268	8,147
Belgium									30,400	30,759
Bulgaria	35,756	19,890	12,051	9,694	10,752	11,984	14,582			14,354
Canada		56,067	53,333	52,790	49,961	53,045	53,483	55,303	55,226	53,129
Finland		14,358	NE	13,717	13,491	14,098	13,785	13,669	15,122	15,282
Greece		10,107	9,987	9,568	9,300	9,107	9,884	10,607	10,842	10,953
Hungary	10,893	7,893	6,380	5,131	5,548	6,306	6,352	6,199	4,905	8,629
Ireland		3,833	3,839	3,620	3,599	3,702	3,527	3,512	3,988	3,917
Italy		83,220	80,031	78,619	82,399	84,619	89,380	87,394	92,843	85,630
Japan		339,227	337,590	327,780	332,138	340,622	345,719	352,685	353,466	343,278
Netherlands		41,440	42,660	42,510	39,920	40,950	43,430	42,100	44,400	43,900
New Zealand		4,812	5,157	4,818	4,962	5,303	5,448	5,847	5,882	5,977
Norway		3,010	2,779	2,668	2,951	3,629	3,253	3,785	3,813	4,038
Spain		48,817	50,038	49,176	47,361	51,310	55,333	49,440	56,135	60,058
Sweden		13,050	12,231	11,759	12,691	13,938	13,541	14,400	13,959	12,200
Switzerland		5,237	5,410	4,994	4,862	4,861	5,098	4,853	4,736	4,893
United Kingdom		94,504	95,207	93,647	92,263	93,786	91,334	92,373	90,419	88,579
United States		1,047,111	1,019,591	1,069,075	1,065,257	1,087,209	1,093,835	1,124,487	1,126,702	1,100,141

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-1.2	-4.4	0.4	1.6	6.2	2.0	-1.5	-0.1	2.6
Austria	-8.3	2.0	-1.4	-2.7	12.7	4.5	5.3	-1.5	9.6
Belgium								1.2	
Bulgaria	-39.4	-19.6	10.9	11.5	21.7				-59.9
Canada	-4.9	-1.0	-5.4	6.2	0.8	3.4	-0.1	-3.8	-5.2
Finland			-1.6	4.5	-2.2	-0.8	10.6	1.1	6.4
Greece	-1.2	-4.2	-2.8	-2.1	8.5	7.3	2.2	1.0	8.4
Hungary	-19.2	-19.6	8.1	13.7	0.7	-2.4	-20.9	75.9	-20.8
Ireland	0.2	-5.7	-0.6	2.9	-4.7	-0.4	13.5	-1.8	2.2
Italy	-3.8	-1.8	4.8	2.7	5.6	-2.2	6.2	-7.8	2.9
Japan	-0.5	-2.9	1.3	2.6	1.5	2.0	0.2	-2.9	1.2
Netherlands	2.9	-0.4	-6.1	2.6	6.1	-3.1	5.5	-1.1	5.9
New Zealand	7.2	-6.6	3.0	6.9	2.7	7.3	0.6	1.6	24.2
Norway	-7.7	-4.0	10.6	23.0	-10.4	16.4	0.7	5.9	34.2
Spain	2.5	-1.7	-3.7	8.3	7.8	-10.7	13.5	7.0	23.0
Sweden	-6.3	-3.9	7.9	9.8	-2.8	6.3	-3.1	-12.6	-6.5
Switzerland	3.3	-7.7	-2.6	0.0	4.9	-4.8	-2.4	3.3	-6.6
United Kingdom	0.7	-1.6	-1.5	1.7	-2.6	1.1	-2.1	-2.0	-6.3
United States	-2.6	4.9	-0.4	2.1	0.6	2.8	0.2	-2.4	5.1

Note:
The Czech Republic, Latvia, Lithuania and Slovakia are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987). For these Parties, the values in the column "percentage change from 1990 to 1998" refers to the base year data.

Energy - Other sectors (commercial/institutional, residential, agriculture/forestry/fisheries) (all fuels):

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage chang

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		12,486	12,559	12,895	13,376	13,492	13,961	14,045	14,572	14,801
Austria		13,305	15,795	14,351	14,741	14,714	14,839	16,455	14,965	14,847
Belgium									31,257	31,757
Bulgaria	7,612	5,381	4,086	4,612	4,117	3,325	2,621			2,989
Canada		69,190	68,595	70,856	73,624	73,243	73,714	79,197	76,318	67,845
Finland		7,571	NE	6,794	6,060	6,706	7,116	7,572	6,789	6,659
Greece		8,168	8,499	8,139	8,002	8,046	8,132	10,060	10,268	10,612
Hungary	23,174	20,877	21,749	17,306	17,591	16,960	16,762	18,091	16,221	13,451
Ireland		9,726	9,640	9,388	9,049	9,495	9,317	9,092	9,421	9,974
Italy		75,553	83,867	78,459	78,500	69,661	76,878	78,280	71,372	77,669
Japan		158,233	164,502	169,778	168,984	167,049	177,029	173,326	171,613	166,784
Netherlands		35,360	40,390	37,330	40,060	38,460	38,930	45,200	36,700	36,100
New Zealand		2,845	2,701	2,956	2,717	2,926	2,797	2,658	2,755	2,857
Norway		3,875	3,354	3,039	2,987	3,176	3,184	3,931	3,506	3,469
Spain		24,070	27,534	26,881	25,863	26,936	26,605	27,635	27,654	28,089
Sweden		10,672	10,281	10,230	10,088	10,148	9,903	11,016	9,964	9,615
Switzerland		18,631	19,810	19,830	19,100	18,023	19,013	19,810	18,785	19,401
United Kingdom		112,032	123,385	120,084	123,276	118,156	113,974	127,173	118,211	118,320
United States		549,330	560,838	570,239	591,399	580,627	589,314	621,629	608,094	570,707

Relative Change to Previous Year (%

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.6	2.7	3.7	0.9	3.5	0.6	3.8	1.6	18.5
Austria	18.7	-9.1	2.7	-0.2	0.9	10.9	-9.1	-0.8	11.6
Belgium								1.6	
Bulgaria	-24.1	12.9	-10.7	-19.2	-21.2				-60.7
Canada	-0.9	3.3	3.9	-0.5	0.6	7.4	-3.6	-11.1	-1.9
Finland			-10.8	10.7	6.1	6.4	-10.3	-1.9	-12.0
Greece	4.1	-4.2	-1.7	0.5	1.1	23.7	2.1	3.3	29.9
Hungary	4.2	-20.4	1.6	-3.6	-1.2	7.9	-10.3	-17.1	-42.0
Ireland	-0.9	-2.6	-3.6	4.9	-1.9	-2.4	3.6	5.9	2.5
Italy	11.0	-6.4	0.1	-11.3	10.4	1.8	-8.8	8.8	2.8
Japan	4.0	3.2	-0.5	-1.1	6.0	-2.1	-1.0	-2.8	5.4
Netherlands	14.2	-7.6	7.3	-4.0	1.2	16.1	-18.8	-1.6	2.1
New Zealand	-5.1	9.4	-8.1	7.7	-4.4	-5.0	3.6	3.7	0.4
Norway	-13.4	-9.4	-1.7	6.3	0.2	23.4	-10.8	-1.0	-10.5
Spain	14.4	-2.4	-3.8	4.2	-1.2	3.9	0.1	1.6	16.7
Sweden	-3.7	-0.5	-1.4	0.6	-2.4	11.2	-9.5	-3.5	-9.9
Switzerland	6.3	0.1	-3.7	-5.6	5.5	4.2	-5.2	3.3	4.1
United Kingdom	10.1	-2.7	2.7	-4.2	-3.5	11.6	-7.0	0.1	5.6
United States	2.1	1.7	3.7	-1.8	1.5	5.5	-2.2	-6.1	3.9

Note:
The Czech Republic, Latvia, Lithuania and Slovakia are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987).
For these Parties, the values in the column "percentage change from 1990 to 1998" refers to the base year data.

Energy - Energy Industries by fuel type: Liquid

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	8,780	9,206	8,354	8,739	8,804	9,690	10,021	8,865	8,904
Canada	37,683								42,463
Finland	2,603								2,844
Japan	161,303	154,719	159,106	133,524	157,787	136,610	128,391	112,674	103,201
New Zealand	224	227	408	275	168	271	214	153	193
United Kingdom	38,962	37,828	35,456	33,975	30,868	30,891	30,148	24,544	22,983
United States	96,804	91,150	73,888	81,805	74,986	50,951	56,030	64,098	90,761

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	4.9	-9.2	4.6	0.7	10.1	3.4	-11.5	0.4	1.4
Canada									12.7
Finland									9.3
Japan	-4.1	2.8	-16.1	18.2	-13.4	-6.0	-12.2	-8.4	-36.0
New Zealand	1.5	79.5	-32.5	-39.0	61.5	-21.1	-28.5	26.5	-13.7
United Kingdom	-2.9	-6.3	-4.2	-9.1	0.1	-2.4	-18.6	-6.4	-41.0
United States	-5.8	-18.9	10.7	-8.3	-32.1	10.0	14.4	41.6	-6.2

Energy - Energy Industries by fuel type: Solid

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	119,873	124,606	127,768	127,720	128,058	131,690	137,985	144,820	161,263
Canada	79,302								99,137
Finland	9,279								8,171
Japan	100,499	105,104	108,854	116,531	124,765	134,545	139,789	148,514	146,238
New Zealand	491	229	913	446	389	561	614	1,199	767
United Kingdom	180,801	179,415	168,239	140,228	132,575	126,668	117,122	99,728	102,653
United States	1,499,681	1,493,231	1,509,982	1,571,738	1,574,725	1,587,527	1,677,435	1,729,951	1,750,220

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	3.9	2.5	0.0	0.3	2.8	4.8	5.0	11.4	34.5
Canada									25.0
Finland									-11.9
Japan	4.6	3.6	7.1	7.1	7.8	3.9	6.2	-1.5	45.5
New Zealand	-53.4	299.4	-51.2	-12.8	44.3	9.6	95.2	-36.0	56.3
United Kingdom	-0.8	-6.2	-16.6	-5.5	-4.5	-7.5	-14.9	2.9	-43.2
United States	-0.4	1.1	4.1	0.2	0.8	5.7	3.1	1.2	16.7

Energy - Energy Industries by fuel type: Gaseous

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	13,154	11,485	12,390	13,332	13,988	15,428	15,328	15,718	17,056
Canada	27,614								39,601
Finland	2,659								4,738
Japan	77,105	82,144	81,498	81,613	86,770	88,215	92,267	95,660	98,478
New Zealand	3,583	4,233	4,523	4,225	3,548	2,935	3,807	5,227	3,978
United Kingdom	9,241	9,765	13,274	26,036	34,043	41,285	51,040	59,838	63,344
United States	151,058	150,646	149,321	144,867	161,381	172,967	147,693	159,686	175,265

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-12.7	7.9	7.6	4.9	10.3	-0.6	2.5	8.5	29.7
Canada									43.4
Finland									78.2
Japan	6.5	-0.8	0.1	6.3	1.7	4.6	3.7	2.9	27.7
New Zealand	18.1	6.9	-6.6	-16.0	-17.3	29.7	37.3	-23.9	11.0
United Kingdom	5.7	35.9	96.1	30.8	21.3	23.6	17.2	5.9	585.5
United States	-0.3	-0.9	-3.0	11.4	7.2	-14.6	8.1	9.8	16.0

Energy - Energy Industries

Relative contribution (%) of each fuel type to total CO_2 emissions from Energy Industries for 1990 and 1998

	Liquid		**Solid**		**Gaseous**	
	1990	**1998**	**1990**	**1998**	**1990**	**1998**
Australia	6.2	4.8	84.5	86.1	9.3	9.1
Canada	26.1	23.4	54.8	54.7	19.1	21.9
Finland	14.1	13.3	50.1	38.2	14.4	22.1
Japan	47.6	29.7	29.7	42.0	22.8	28.3
New Zealand	3.7	3.7	8.1	14.6	58.9	75.6
United Kingdom	17.0	12.1	78.9	54.1	4.0	33.4
United States	5.5	4.5	85.8	86.8	8.6	8.7

Note:
The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - Manufacturing Industries and Construction by fuel type: Liquid

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	10,908	10,413	10,130	10,491	10,547	10,918	12,178	11,401	11,465
Canada	13,557								9,540
Finland	4,294								4,101
Japan	153,532	151,150	149,147	152,195	157,882		161,489	157,079	157,825
New Zealand	733	706	763	639	690	704	732	708	603
United Kingdom	27,588	29,292	30,131	30,504	30,387	27,572	27,329	24,782	22,859
United States	366,518	345,508	382,084	359,507	373,838	357,433	378,931	387,832	373,208

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-4.5	-2.7	3.6	0.5	3.5	11.5	-6.4	0.6	5.1
Canada									-29.6
Finland									-4.5
Japan	-1.6	-1.3	2.0	3.7	-100.0		-2.7	0.5	2.8
New Zealand	-3.7	8.1	-16.2	8.0	1.9	4.0	-3.3	-14.9	-17.8
United Kingdom	6.2	2.9	1.2	-0.4	-9.3	-0.9	-9.3	-7.8	-17.1
United States	-5.7	10.6	-5.9	4.0	-4.4	6.0	2.3	-3.8	1.8

Energy - Manufacturing Industries and Construction by fuel type: Solid

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	24,941	24,614	22,836	22,541	22,779	24,071	23,737	23,637	23,374
Canada	6,869								6,058
Finland	6,410								5,780
Japan	178,866	178,635	170,165	170,319	172,024		178,799	182,756	171,522
New Zealand	2,004	1,987	1,775	2,000	1,944	1,798	1,733	1,693	1,678
United Kingdom	37,983	38,282	37,937	35,457	34,107	32,637	30,587	30,681	28,676
United States	248,382	235,036	226,599	225,105	227,094	225,038	216,956	215,313	214,003

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-1.3	-7.2	-1.3	1.1	5.7	-1.4	-0.4	-1.1	-6.3
Canada									-11.8
Finland									-9.8
Japan	-0.1	-4.7	0.1	1.0	-100.0		2.2	-6.1	-4.1
New Zealand	-0.8	-10.7	12.7	-2.8	-7.5	-3.6	-2.3	-0.8	-16.2
United Kingdom	0.8	-0.9	-6.5	-3.8	-4.3	-6.3	0.3	-6.5	-24.5
United States	-5.4	-3.6	-0.7	0.9	-0.9	-3.6	-0.8	-0.6	-13.8

Energy - Manufacturing Industries and Construction by fuel type: Gaseous

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	14,181	14,378	14,261	14,391	14,854	16,155	16,244	16,349	16,508
Canada	35,641								37,531
Finland	2,093								2,672
Japan	6,829	7,805	8,468	9,625	10,716		12,398	13,631	13,930
New Zealand	2,076	2,464	2,279	2,322	2,669	2,946	3,381	3,482	3,696
United Kingdom	28,933	27,633	25,579	26,302	29,250	31,040	34,372	34,887	36,993
United States	432,211	439,047	460,392	480,645	486,278	511,363	528,600	523,557	512,931

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	1.4	-0.8	0.9	3.2	8.8	0.5	0.7	1.0	16.4
Canada									5.3
Finland									27.7
Japan	14.3	8.5	13.7	11.3	-100.0		9.9	2.2	104.0
New Zealand	18.7	-7.5	1.9	14.9	10.4	14.8	3.0	6.2	78.1
United Kingdom	-4.5	-7.4	2.8	11.2	6.1	10.7	1.5	6.0	27.9
United States	1.6	4.9	4.4	1.2	5.2	3.4	-1.0	-2.0	18.7

Energy - Manufacturing Industries and Construction

Relative contribution (%) of each fuel type to total CO_2 emissions from Manufacturing Industries and Construction for 1990 and 1998

	Liquid		**Solid**		**Gaseous**	
	1990	**1998**	**1990**	**1998**	**1990**	**1998**
Australia	21.8	22.3	49.9	45.5	28.3	32.1
Canada	24.2	18.0	12.3	11.4	63.6	70.6
Finland	29.9	26.8	44.6	37.8	14.6	17.5
Japan	45.3	46.0	52.7	50.0	2.0	4.1
New Zealand	15.2	10.1	41.6	28.1	43.1	61.8
United Kingdom	29.2	25.8	40.2	32.4	30.6	41.8
United States	35.0	33.9	23.7	19.5	41.3	46.6

Note:
The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - Other Sectors (commercial/institutional, residential, agriculture/forestry/fisheries) by fuel type: Liquid

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	5,500	5,521	5,627	5,851	5,878	5,927	5,959	6,061	6,174
Canada	22,287								17,776
Finland	7,274								6,265
Japan	136,229	142,134	146,723	144,155	141,618	149,455	144,625	142,901	137,349
New Zealand	1,601	1,464	1,787	1,451	1,676	1,612	1,489	1,615	1,725
United Kingdom	20,147	21,169	21,451	21,728	21,229	20,445	21,916	20,021	19,810
United States	153,779	152,004	149,959	150,747	147,531	149,304	153,224	149,666	149,525

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.4	1.9	4.0	0.5	0.8	0.5	1.7	1.9	12.2
Canada									-20.2
Finland									-13.9
Japan	4.3	3.2	-1.8	-1.8	5.5	-3.2	-1.2	-3.9	0.8
New Zealand	-8.5	22.0	-18.8	15.5	-3.8	-7.7	8.5	6.9	7.8
United Kingdom	5.1	1.3	1.3	-2.3	-3.7	7.2	-8.6	-1.1	-1.7
United States	-1.2	-1.3	0.5	-2.1	1.2	2.6	-2.3	-0.1	-2.8

Energy - Other Sectors (commercial/institutional, residential, agriculture/forestry/fisheries) by fuel type: Solid

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	583	537	455	407	415	372	337	309	301
Canada	191								154
Finland	57								26
Japan	5,048	4,260	4,275	4,651	5,171	5,842	6,041	5,626	5,769
New Zealand	806	788	693	770	737	671	637	613	598
United Kingdom	19,007	20,193	17,443	18,642	15,534	11,190	11,642	10,828	8,979
United States	14,564	13,286	13,506	13,394	12,979	12,707	13,003	13,721	13,527

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-8.0	-15.3	-10.5	1.9	-10.2	-9.6	-8.3	-2.5	-48.4
Canada									-19.7
Finland									-54.9
Japan	-15.6	0.4	8.8	11.2	13.0	3.4	-6.9	2.5	14.3
New Zealand	-2.3	-12.0	11.0	-4.3	-8.9	-5.1	-3.8	-2.4	-25.8
United Kingdom	6.2	-13.6	6.9	-16.7	-28.0	4.0	-7.0	-17.1	-52.8
United States	-8.8	1.7	-0.8	-3.1	-2.1	2.3	5.5	-1.4	-7.1

Energy - Other Sectors (commercial/institutional, residential, agriculture/forestry/fisheries) by fuel type: Gaseous

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	6,402	6,501	6,813	7,118	7,199	7,662	7,749	8,202	8,327
Canada	46,712								49,915
Finland	99								241
Japan	16,957	18,108	18,780	20,179	20,261	21,732	22,660	23,086	23,666
New Zealand	438	449	475	497	513	513	532	528	533
United Kingdom	72,878	82,024	81,190	82,907	81,393	82,339	93,615	87,361	89,530
United States	380,987	395,548	406,774	427,258	420,116	427,304	455,402	444,706	407,656

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	1.5	4.8	4.5	1.1	6.4	1.1	5.8	1.5	30.1
Canada									6.9
Finland									144.4
Japan	6.8	3.7	7.5	0.4	7.3	4.3	1.9	2.5	39.6
New Zealand	2.4	5.9	4.5	3.2	0.2	3.7	-0.9	1.1	21.7
United Kingdom	12.5	-1.0	2.1	-1.8	1.2	13.7	-6.7	2.5	22.8
United States	3.8	2.8	5.0	-1.7	1.7	6.6	-2.3	-8.3	7.0

Energy - Other Sectors (commercial/institutional, residential, agriculture/forestry/fisheries)

Relative contribution (%) of each fuel type in total CO_2 emissions from Other sectors for 1990 and 1998

	Liquid		**Solid**		**Gaseous**	
	1990	**1998**	**1990**	**1998**	**1990**	**1998**
Australia	44.1	41.7	4.7	2.0	51.3	56.3
Canada	32.2	26.2	0.3	0.2	67.5	73.6
Finland	96.1	94.1	0.7	0.4	1.3	3.6
Japan	86.1	82.4	3.2	3.5	10.7	14.2
New Zealand	56.3	60.4	28.3	20.9	15.4	18.7
United Kingdom	18.0	16.7	17.0	7.6	65.1	75.7
United States	28.0	26.2	2.7	2.4	69.4	71.4

Note:
The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - Fuel Combustion

Total Energy Consumption from Fuel combustion by Fuel Type: 1990 to 1998 (TJ and annual percentage change):

Solid Fuels

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	1,572,278	1,618,578	1,640,943	1,638,163	1,648,489	1,699,793	1,760,009	1,849,469	2,029,195
Canada	1,099,891								1,288,149
Finland	167,071								148,994
Japan	2,881,515	2,928,835	2,871,199	2,957,735	3,072,533	133,654	3,274,088	3,386,043	3,266,836
New Zealand	36,094	32,889	36,880	35,163	33,570	33,110	32,599	38,172	33,371
United Kingdom	2,503,191	2,520,437	2,365,577	2,047,001	1,909,931	1,810,597	1,685,483	1,484,114	1,486,962
United States	19,985,226	19,736,210	19,846,579	20,507,765	20,550,417	20,655,051	21,584,953	22,147,530	22,351,990

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	2.9	1.4	-0.2	0.6	3.1	3.5	5.1	9.7	29.1
Canada									17.1
Finland									-10.8
Japan	1.6	-2.0	3.0	3.9	-95.7	2349.7	3.4	-3.5	13.4
New Zealand	-8.9	12.1	-4.7	-4.5	-1.4	-1.5	17.1	-12.6	-7.5
United Kingdom	0.7	-6.1	-13.5	-6.7	-5.2	-6.9	-11.9	0.2	-40.6
United States	-1.2	0.6	3.3	0.2	0.5	4.5	2.6	0.9	11.8

Liquid Fuels

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	1,237,313	1,241,029	1,269,174	1,292,190	1,341,265	1,395,382	1,383,803	1,452,405	1,259,860
Canada	3,115,442								3,357,343
Finland	372,298								366,470
Japan	8,930,758	9,014,070	9,199,060	8,915,604	9,448,038	3,382,673	9,310,788	9,055,925	8,879,177
New Zealand	146,671	145,936	160,098	157,068	167,336	178,289	179,601	187,434	191,372
United Kingdom	2,897,503	2,897,035	2,892,306	2,899,718	2,852,017	2,786,673	2,858,381	2,735,895	2,672,516
United States	34,148,365	33,478,702	34,267,622	34,647,124	35,601,619	35,479,041	36,762,808	37,264,495	37,940,667

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.3	2.3	1.8	3.8	4.0	-0.8	5.0	-13.3	1.8
Canada									7.8
Finland									-1.6
Japan	0.9	2.1	-3.1	6.0	-64.2	175.2	-2.7	-2.0	-0.6
New Zealand	-0.5	9.7	-1.9	6.5	6.5	0.7	4.4	2.1	30.5
United Kingdom	0.0	-0.2	0.3	-1.6	-2.3	2.6	-4.3	-2.3	-7.8
United States	-2.0	2.4	1.1	2.8	-0.3	3.6	1.4	1.8	11.1

Gaseous Fuels

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	657,379	630,809	652,617	679,848	703,601	760,119	761,664	784,095	825,195
Canada	2,763,972								3,346,514
Finland	91,838								143,722
Japan	1,855,107	1,988,791	2,004,977	2,056,830	2,174,306	93,902	2,353,945	2,452,797	2,522,990
New Zealand	129,529	155,262	155,106	152,753	151,799	154,291	187,706	219,470	195,115
United Kingdom	1,883,968	2,027,117	2,027,749	2,275,727	2,429,153	2,572,112	2,993,107	3,055,597	3,191,628
United States	20,321,525	20,663,759	21,230,426	22,022,413	22,457,388	23,356,859	23,774,333	23,765,672	23,090,017

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-4.0	3.5	4.2	3.5	8.0	0.2	2.9	5.2	25.5
Canada									21.1
Finland									56.5
Japan	7.2	0.8	2.6	5.7	-95.7	2406.8	4.2	2.9	36.0
New Zealand	19.9	-0.1	-1.5	-0.6	1.6	21.7	16.9	-11.1	50.6
United Kingdom	7.6	0.0	12.2	6.7	5.9	16.4	2.1	4.5	69.4
United States	1.7	2.7	3.7	2.0	4.0	1.8	0.0	-2.8	13.6

Biomass

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	179,114	178,072	164,874	182,513	191,239	200,040	199,970	219,380	221,780
Canada	630,781								749,808
Finland	169,787								250,617
Japan	IE	IE	IE	IE	IE	IE	IE	IE	IE
New Zealand	27,420	29,280	28,030	29,430	33,390	33,690	34,030	32,600	34,009
United Kingdom	47,165	37,641	40,198	41,602	45,418	48,342	50,527	53,047	56,213
United States	2,690,392	2,718,879	2,858,146	2,844,431	2,974,696	3,106,056	3,200,569	3,043,169	3,110,305

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-0.6	-7.4	10.7	4.8	4.6	0.0	9.7	1.1	23.8
Canada									18.9
Finland									47.6
Japan									
New Zealand	6.8	-4.3	5.0	13.5	0.9	1.0	-4.2	4.3	24.0
United Kingdom	-20.2	6.8	3.5	9.2	6.4	4.5	5.0	6.0	19.2
United States	1.1	5.1	-0.5	4.6	4.4	3.0	-4.9	2.2	15.6

Other Fuels

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	22,440	33,396	33,350	37,760	41,860	51,650	56,160	60,600	0
Canada	35,357								27,154
Finland	54,175								82,057
Japan	274,023	292,809	286,669	256,483	261,790	260,828	290,230	310,301	272,654
New Zealand	18,444	16,878	16,617	17,402	20,474	20,961	19,333	16,444	16,117
United Kingdom	4,403	4,451	5,422	7,518	14,156	15,030	16,280	19,877	24,189
United States	53,903	50,118	48,568	47,242	58,937	51,266	18,722	35,211	33,495

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	48.8	-0.1	13.2	10.9	23.4	8.7	7.9	-100.0	-100.0
Canada									-23.2
Finland									51.5
Japan	6.9	-2.1	-10.5	2.1	-0.4	11.3	6.9	-12.1	-0.5
New Zealand	-8.5	-1.5	4.7	17.7	2.4	-7.8	-14.9	-2.0	-12.6
United Kingdom	1.1	21.8	38.7	88.3	6.2	8.3	22.1	21.7	449.3
United States	-7.0	-3.1	-2.7	24.8	-13.0	-63.5	88.1	-4.9	-37.9

All Fuels

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	3,668,524	3,701,885	3,760,958	3,830,473	3,926,453	4,106,984	4,161,606	4,365,948	4,336,030
Canada	7,645,442								8,768,968
Finland	855,170								991,860
Japan	13,941,402	14,224,505	14,361,905	14,186,652	14,956,666	3,871,057	15,229,051	15,205,065	14,941,657
New Zealand	358,158	380,245	396,732	391,816	406,569	420,340	453,269	494,120	469,983
United Kingdom	7,336,231	7,486,680	7,331,251	7,271,565	7,250,674	7,232,754	7,603,778	7,348,530	7,431,508
United States	77,199,411	76,647,668	78,251,341	80,068,975	81,643,057	82,648,273	85,341,386	86,256,078	86,526,474

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.9	1.6	1.8	2.5	4.6	1.3	4.9	-0.7	18.2
Canada									14.7
Finland									16.0
Japan	2.0	1.0	-1.2	5.4	-74.1	293.4	-0.2	-1.7	7.2
New Zealand	6.2	4.3	-1.2	3.8	3.4	7.8	9.0	-4.9	31.2
United Kingdom	2.1	-2.1	-0.8	-0.3	-0.2	5.1	-3.4	1.1	1.3
United States	-0.7	2.1	2.3	2.0	1.2	3.3	1.1	0.3	12.1

Relative contribution (%) of each fuel type to Total Energy Consumption from Fuel combustion for 1990 and 1998

	Liquid		**Solid**		**Gaseous**		**Biomass**		**Other Fuels**	
	1990	**1998**	**1990**	**1998**	**1990**	**1998**	**1990**	**1998**	**1990**	**1998**
Australia	33.7	29.1	42.9	46.8	17.9	19.0	4.9	5.1	0.6	0.0
Canada	40.7	38.3	14.4	14.7	36.2	38.2	8.3	8.6	0.5	0.3
Finland	43.5	36.9	19.5	15.0	10.7	14.5	19.9	25.3	6.3	8.3
Japan	64.1	59.4	20.7	21.9	13.3	16.9	0.0	0.0	2.0	1.8
New Zealand	41.0	40.7	10.1	7.1	36.2	41.5	7.7	7.2	5.1	3.4
United Kingdom	39.5	36.0	34.1	20.0	25.7	42.9	0.6	0.8	0.1	0.3
United States	44.2	43.8	25.9	25.8	26.3	26.7	3.5	3.6	0.1	0.0

Note:
The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - Road Transportation (1998)

Party	1.A.3.b Road Transportation (CO_2 and N_2O)											
	Methods and EF used[a]		IEF in CRF based on	CO_2 emissions				N_2O emissions				
						CO_2 IEF				N_2O IEF	
	Methods	EF		Key source	percent of national total	Gasoline	Diesel Oil	Key source	percent of national total	Gasoline	Diesel Oil
					(%)	(t/TJ)			(%)	(kg/TJ)	
IPCC Default EF[b]			**NCV**			**72.1 (US) 73.0 (Europe)**	**72.1 (US) 74.0 (Europe)**			**3-43 (US) 1-20 (Europe)**	**1-14 (US) 3-4 (Europe)**
Australia	T1, T2	CS	GCV	L	12.7	65.3	69.0	L	0.8	18.5	1.8
Austria	M	CS	NCV	L	20.5	73.5	74.2	L	0.7	16.7	2.6
Belgium											
Bulgaria	T2	C, CS, D	NCV	L	6.1	71.4	76.1			0.9	1.9
Canada	CS	CS	GCV	L	17.6	68.1	70.6	L	0.8	14.1	2.6
Czech Republic	T1	D	NCV	L	7.0	68.7	73.3			16.5	3.0
Finland	CS (M)	CS	NCV	L	14.2	72.8	74.9			11.7	3.0
Greece	C	C	NCV	L	12.6	68.7	73.4			6.3	3.7
Hungary	D	D	NCV	L	9.6	68.6	73.3			1.5	0.6
Ireland	T1	CS	NCV	L	13.0	70.0	73.3			10.5	4.2
Italy			NCV	L	19.3	68.2	73.3	L	0.6	7.5	6.2
Japan	T1, RA, CS	D, CS	NCV	L	16.9	70.6	72.3			5.0	3.6
Latvia											
Lithuania	RA, T1	D	NCV	L	14.2	67.9	72.6			0.6	0.1
Netherlands	CS	CS	NCV	L	13.2	73.0	73.0			14.9	10.1
New Zealand	T1	CS/D	NCV	L	13.7	NE[c]	NE[c]			NE[c]	NE[c]
Norway	M, T1, CS/T2	CS	NCV	L	16.0	71.3	73.6			15.5	1.9
Slovakia[d]	COPERT	COPERT	NCV	L	8.7						
Spain											
Sweden	CS	CS	NCV	L	23.6	76.3	80.9	L	0.6	8.7	1.6
Switzerland	CS	CS	NCV	L	26.7	73.9	73.6	L	1.2	12.0	2.9
United Kingdom	T2	CS	NCV	L	17.0	70.2	72.7	L	0.6	10.7	3.1
United States	T1, T2	D, CS	GCV	L	19.3	66.5	66.4	L	0.9	11.8	2.1

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "1.A.3 Transport".

[b] Source of default emission factors: IPCC Guidelines, Volume 3, pages 1.70-1.83.

[c] New Zealand did not report activity data and emissions from the use of Gasoline and Diesel for Road Transportation. However, activity data, emissions and IEFs were provided for the total Transport sector (CO_2 IEF for gasoline = 65.9 t/TJ, CO_2 IEF for diesel oil = 68.0 t/TJ, N_2O IEF for gasoline = 3.0 kg/TJ and N_2O IEF for diesel oil 3.1 kg/TJ).

[d] Slovakia reported activity data for gasoline and diesel oil but CO_2 and N_2O emissions were reported as totals for the whole Road Transportation sub-category.

Energy - Transport:

Trends in CO_2 Emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		59,288	58,577	60,095	60,832	62,378	64,870	66,915	68,488	68,434
Austria		13,570	15,059	15,054	15,104	16,163	15,432	15,379	15,793	16,753
Belgium									24,334	24,697
Bulgaria	12,639	10,864	6,525	6,435	7,444	6,547	6,845			6,475
Canada		145,833	140,611	144,669	147,814	155,224	159,440	163,928	170,335	174,252
Finland		12,475	NE	11,592	10,993	11,414	11,126	10,994	11,531	12,299
Greece		15,358	16,135	16,562	16,761	16,867	16,972	17,258	18,040	19,790
Hungary	7,741	8,208	7,383	7,189	7,141	7,212	7,001	6,612	7,741	8,381
Ireland		4,961	5,206	5,625	5,591	5,829	6,306	7,063	7,684	8,768
Italy		95,616	94,849	99,426	102,031	103,849	105,300	108,310	110,188	110,167
Japan		205,633	215,313	220,473	222,474	233,425	240,292	246,874	251,376	251,132
Netherlands		28,560	28,550	29,830	30,460	30,800	32,030	33,821	34,333	34,715
New Zealand		8,660	8,662	9,047	9,458	10,160	10,869	10,989	11,242	11,435
Norway		11,646	11,616	11,833	12,394	12,180	12,554	13,154	13,391	13,752
Slovakia		5,070	4,426	4,116	4,029	4,189	4,216	4,164	4,591	4,950
Spain		58,004	60,804	64,695	61,161	65,756	66,747	71,874	71,892	78,390
Sweden		18,650	18,613	19,099	18,322	18,685	19,341	19,573	18,957	21,140
Switzerland		14,144	14,668	14,983	13,933	14,117	13,815	13,885	14,462	14,689
United Kingdom		116,721	116,194	117,647	118,822	119,175	118,066	122,679	123,756	122,899
United States		1,413,363	1,381,486	1,420,962	1,451,270	1,494,606	1,523,797	1,570,220	1,582,575	1,607,581

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-1.2	2.6	1.2	2.5	4.0	3.2	2.4	-0.1	15.4
Austria	11.0	0.0	0.3	7.0	-4.5	-0.3	2.7	6.1	23.5
Belgium								1.5	
Bulgaria	-39.9	-1.4	15.7	-12.0	4.5				-56.7
Canada	-3.6	2.9	2.2	5.0	2.7	2.8	3.9	2.3	19.5
Finland			-5.2	3.8	-2.5	-1.2	4.9	6.7	-1.4
Greece	5.1	2.6	1.2	0.6	0.6	1.7	4.5	9.7	28.9
Hungary	-10.1	-2.6	-0.7	1.0	-2.9	-5.5	17.1	8.3	7.8
Ireland	4.9	8.0	-0.6	4.2	8.2	12.0	8.8	14.1	76.8
Italy	-0.8	4.8	2.6	1.8	1.4	2.9	1.7	0.0	15.2
Japan	4.7	2.4	0.9	4.9	2.9	2.7	1.8	-0.1	22.1
Netherlands	0.0	4.5	2.1	1.1	4.0	5.6	1.5	1.1	21.6
New Zealand	0.0	4.5	4.5	7.4	7.0	1.1	2.3	1.7	32.0
Norway	-0.3	1.9	4.7	-1.7	3.1	4.8	1.8	2.7	18.1
Slovakia	-12.7	-7.0	-2.1	4.0	0.6	-1.2	10.3	7.8	-2.4
Spain	4.8	6.4	-5.5	7.5	1.5	7.7	0.0	9.0	35.1
Sweden	-0.2	2.6	-4.1	2.0	3.5	1.2	-3.1	11.5	13.3
Switzerland	3.7	2.1	-7.0	1.3	-2.1	0.5	4.2	1.6	3.9
United Kingdom	-0.5	1.3	1.0	0.3	-0.9	3.9	0.9	-0.7	5.3
United States	-2.3	2.9	2.1	3.0	2.0	3.0	0.8	1.6	13.7

The Czech Republic, Latvia and Lithuania are not included in this table because data for years other than 1998 were not reported.

Trends in N_2O emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		5.27	5.95	7.22	8.12	9.03	9.92	10.65	11.32	11.91
Austria		1.05	1.30	1.47	1.61	1.80	1.84	1.82	1.81	1.90
Belgium									1.57	1.65
Bulgaria	0.23	0.25	0.15	0.14	0.16	0.14	0.14			0.13
Canada		20.77	21.14	22.93	25.10	27.50	28.35	28.33	28.66	28.08
Finland		2.05	NE	1.30	1.10	1.18	1.81	1.94	2.04	2.45
Greece		0.65	0.77	0.92	1.00	1.09	1.12	1.14	1.26	2.00
Ireland		0.28	0.30	0.33	0.44	0.53	0.55	0.69	0.83	1.02
Italy		3.67	3.71	3.87	4.68	5.51	5.63	7.60	8.31	12.50
Japan		12.91	13.43	13.73	13.68	13.86	14.28	14.47	14.69	14.64
Netherlands		6.60	6.20	7.20	7.20	7.20	7.40	7.12	7.03	6.43
New Zealand		0.37	0.37	0.39	0.40	0.43	0.46	0.47	0.48	0.49
Norway		0.65	0.70	0.74	0.81	0.96	1.09	1.25	1.43	1.64
Slovakia		0.21	0.20	0.19	0.16	0.30	0.34	0.37	0.45	0.53
Spain		2.75	2.91	3.12	3.24	3.75	4.11	4.65	4.97	5.72
Sweden		2.14	2.60	3.00	2.70	2.90	2.90	2.82	2.86	1.76
Switzerland		0.98	1.13	1.29	1.40	1.53	1.61	1.68	1.74	2.01
United Kingdom		4.19	4.37	4.78	5.93	7.43	8.89	10.40	11.75	13.25
United States		162.66	172.23	185.27	194.92	202.30	205.92	206.70	204.55	203.32

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	12.9	21.3	12.5	11.2	9.9	7.4	6.3	5.2	126.0
Austria	23.8	13.1	9.5	11.8	2.2	-1.1	-0.5	5.0	81.0
Belgium								5.2	
Bulgaria	-40.0	-6.7	14.3	-12.5	0.0				-40.0
Canada	1.8	8.5	9.5	9.6	3.1	-0.1	1.2	-2.0	35.2
Finland			-15.4	7.3	53.4	7.2	5.2	20.1	19.5
Greece	18.5	19.5	8.7	9.0	2.8	1.8	10.5	58.7	207.7
Ireland	7.1	10.0	33.3	20.5	3.8	25.5	20.3	22.9	264.3
Italy	1.1	4.3	20.9	17.7	2.2	35.0	9.3	50.4	240.6
Japan	4.0	2.2	-0.4	1.3	3.0	1.3	1.5	-0.3	13.4
Netherlands	-6.1	16.1	0.0	0.0	2.8	-3.8	-1.3	-8.5	-2.6
New Zealand	0.0	5.4	2.6	7.5	7.0	2.2	2.1	2.1	32.4
Norway	7.7	5.7	9.5	18.5	13.5	14.7	14.4	14.7	152.3
Slovakia	-4.8	-5.0	-15.8	87.5	13.3	8.8	21.6	17.8	152.4
Spain	5.8	7.2	3.8	15.7	9.6	13.1	6.9	15.1	108.0
Sweden	21.5	15.4	-10.0	7.4	0.0	-2.8	1.4	-38.5	-17.8
Switzerland	15.3	14.2	8.5	9.3	5.2	4.3	3.6	15.5	105.1
United Kingdom	4.3	9.4	24.1	25.3	19.7	17.0	13.0	12.8	216.2
United States	5.9	7.6	5.2	3.8	1.8	0.4	-1.0	-0.6	25.0

The Czech Republic, Hungary, Latvia and Lithuania are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987).
For these Parties, the values in the column "percentage change from 1990 to 1998" refers to the base year data.

Energy - Road Transportation:

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	52,766	51,683	52,615	53,805	55,168	56,907	58,500	59,886	60,753
Canada	102,894								121,527
Finland	11,111								10,807
Japan	184,492	193,088	198,001	199,776	209,888	215,797	221,596	224,723	225,513
Netherlands							30,365	30,812	31,182
New Zealand	7,552	7,641	7,984	8,262	8,816	9,527	9,727	10,067	10,269
United Kingdom	109,180	108,381	109,820	111,082	111,682	110,623	114,895	116,340	115,606
United States	1,121,537	1,108,307	1,129,328	1,159,492	1,192,300	1,215,571	1,249,473	1,268,224	1,296,586

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-2.1	1.8	2.3	2.5	3.2	2.8	2.4	1.4	15.1
Canada									18.1
Finland									-2.7
Japan	4.7	2.5	0.9	5.1	2.8	2.7	1.4	0.4	22.2
Netherlands							1.5	1.2	
New Zealand	1.2	4.5	3.5	6.7	8.1	2.1	3.5	2.0	36.0
United Kingdom	-0.7	1.3	1.1	0.5	-0.9	3.9	1.3	-0.6	5.9
United States	-1.2	1.9	2.7	2.8	2.0	2.8	1.5	2.2	15.6

Trends in N_2O emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	5.1	5.8	7.0	7.9	8.8	9.7	10.4	11.1	11.7
Canada	12.0								18.5
Finland									1.1
Japan	12.2	12.7	13.0	13.0	13.1	13.6	13.7	13.9	13.9
Netherlands							6.4	6.3	5.7
New Zealand	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
United Kingdom	3.2	3.3	3.7	4.9	6.4	7.9	9.4	10.9	12.4
United States	153.3	163.0	175.9	185.7	192.8	196.4	196.9	195.2	194.2

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	13.2	21.7	13.0	11.4	10.0	7.3	6.3	5.6	129.7
Canada									54.2
Finland									
Japan	4.2	2.4	-0.2	1.3	3.2	1.3	1.5	0.1	14.6
Netherlands							-1.6	-9.5	
New Zealand	2.9	2.9	5.6	5.3	7.5	2.3	2.3	2.2	35.3
United Kingdom	4.4	11.8	32.4	31.2	22.7	19.1	15.7	13.9	290.9
United States	6.4	7.9	5.6	3.8	1.9	0.3	-0.9	-0.5	26.7

Note:
The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - Domestic Aviation and Marine Transport: Emission factors (1998)

	Domestic Aviation and Marine Transport (CO_2)														
	Methods and EF used[a]		IEF in CRF based on	1.A.3.a Civil Aviation (Domestic)				International Aviation Transport		1.A.3.d Navigation (Domestic)				International Marine Transport	
	Methods	EF		Key source	percent of national total	CO_2 IEF		CO_2 IEF		Key source	percent of national total	CO_2 IEF		CO_2 IEF	
						Jet Kerosene	Aviation Gasoline	Jet Kerosene	Aviation Gasoline			Residual Oil	Gas/Diesel Oil	Residual Oil	Gas/Diesel Oil
					(%)	(t/TJ)		(t/TJ)			(%)	(t/TJ)		(t/TJ)	
IPCC Default EF[b]			**NCV**			**72.8**	**72.1**	**72.8**	**72.1**			**77.6**	**73**	**77.6**	**75.0-77.6**
Australia	T1, T2	CS	GCV			69.0	67.3	69.0	NA			72.9	69.0	72.9	69.0
Austria	M	CS	NCV			72.8	73.8	72.8				0.0	74.1		
Belgium															
Bulgaria	T2	C, CS, D	NCV			70.6	70.8	70.6	70.8			75.9	76.3	80.7	76.3
Canada	CS	CS	GCV	L	1.8	70.1	69.5	70.1	69.5	L	0.7	74.1	70.6	74.1	70.6
Czech Republic	T1	D	NCV			69.3		70.8					73.7		
Finland	CS (M)	CS	NCV	L	0.6	70.8	72.7	70.8				76.7	73.3	76.6	73.4
Greece	C	C	NCV	L	1.0	70.8		70.8	NO	L	2.16	76.6	73.3	76.6	73.3
Hungary	D	D	NCV					70.8					68.6		
Ireland	T1	CS	NCV			NE	NE	71.3	70.0			76.0	73.3	76.0	73.3
Italy			NCV	L	0.4	70.8	68.6	70.7				0.0	73.3	76.7	73.8
Japan[c]	T1, RA, CS	D, CS	NCV			70.7	NO	74.4	NO	L	1.08	NO	72.3	79.1	76.1
Latvia															
Lithuania	RA, T1	D	NCV			70.1	68.1					75.8	72.6	75.8	72.6
Netherlands	CS	CS				73.0		73.1					73.0	77.0	73.0
New Zealand[d]	T1	CS/D	NCV	L	1.1	NE	NE	NE	NE			NE	NE	NE	NE
Norway	M, T1, CS/T2	CS	NCV	L	1.8	73.1	71.3	73.1		L	4.82	78.8	73.6	78.8	73.6
Slovakia	COPERT	COPERT	NCV			NA[e]	[f]						75.0		
Spain															
Sweden	CS	CS	NCV	L	1.1	80.3	75.3	80.3	75.3	L	0.81	88.2	77.3	93.1	80.9
Switzerland	CS	CS	NCV			73.2		73.2				0.0	74.0		
United Kingdom	T2	CS	NCV			71.8	70.6	71.8	IE			75.9	72.7	75.9	72.7
United States	T1, T2	D, CS	GCV	L	2.1	66.5	64.9	66.5	NE	L	0.68	73.9	66.4	73.9	124.0

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "1.A.3 Transport".

[b] Default emission factors (for Gas/Diesel Oil: single value for internal waterways and range for ocean-going ships, boats; IPCC Guidelines (Volume 3, pages 1.89, 1.91).

[c] Japan reported implied emission factors for 3 types of heavy oil under other fuels (average CO_2 EF 74.59 t/TJ).

[d] New Zealand reported aggregate total activity data and emissions data for all fuels used for Aviation and Marine Transport

[e] Slovakia reported only emissions from Jet kerosene. Activity data were reported as NA.

[f] In the CRF, Slovakia indicated that emissions from Aviation Gasoline were "included in jet kerosene".

Energy - Domestic and International Aviation Transport: Activity data (1998)

	Domestic and International Aviation Transport											
	Activity data in CRF based on	1.A.3.a Civil Aviation (Domestic)							International Aviation			
		Jet Kerosene			Aviation Gasoline			share of fuel used for domestic[b]	Jet Kerosene			share of fuel used for international[c]
		CRF	IEA[a]	Difference	CRF	IEA[a]	Difference	CRF	reported in CRF	IEA[a]	Difference	CRF
		(TJ)		(%)	(TJ)		(%)	(%)	(TJ)		(%)	(%)
Australia	GCV	60,246	71,478	18.6	3,368	3,270	-2.9	37.8	104,820	105,484	0.6	62.2
Austria	NCV	1,614	11,861	634.7	93	0		6.3	25,198	12,039	-52.2	93.7
Belgium										65,503		
Bulgaria	NCV	1,681	892	-46.9	18	45	149.7	30.0	3,922	5,618	43.2	70.0
Canada	GCV	175,674	172,563	-1.8	3,818	3,674	-3.8	81.4	41,014	40,265	-1.8	18.6
Czech Republic	NCV	202	3,255	1511.4				6.0	3,175	5,083	60.1	94.0
Finland	NCV	6,202	6,376	2.8	110	134	22.2	31.1	13,984	14,447	3.3	68.9
Greece	NCV	17,523	15,339	-12.5	0	0		33.6	34,601	35,895	3.7	66.4
Hungary	NCV								7,848	8,338	6.2	100.0
Ireland	NCV	NE	981		NE	45			19,217	18,460	-3.9	
Italy	NCV	31,335	12,931	-58.7	309	269	-13.0	25.9	90,537	124,807	37.9	74.1
Japan	NCV	147,274	172,162	16.9	NO	269		37.4	246,184	266,113	8.1	62.6
Latvia										1,516		
Lithuania	NCV	1,135	0		17	0		100.0		1,249		
Netherlands		4,300	3,790	-11.9		134		3.2	130,000	137,783	6.0	96.8
New Zealand	NCV	NE	11,504		NE	627			NE	24,257		100.0
Norway	NCV	13,695	6,421	-53.1	90	0		55.2	11,207	21,894	95.4	44.8
Slovakia	NCV	NA	1,293		NA	0						
Spain			56,540			493				105,857		
Sweden	NCV	9,743	18,683	91.8	55	179	228.0	29.0	23,855	19,486	-18.3	71.0
Switzerland	NCV	3,483	2,586	-25.7	0	269		5.7	57,792	60,687	5.0	94.3
United Kingdom	NCV	36,926	166,455	350.8	1,618	1,523	-5.8	10.3	336,139	243,551	-27.5	89.7
United States	GCV	2,071,643	2,570,435	24.1	37,452	39,603	5.7	71.1	855,758	811,716	-5.1	28.9

Notes:

[a] Data from the International Energy Agency (conversion factors used: 44.59 TJ/kt for jet kerosene and 44.80 TJ/kt for aviation gasoline, source of conversion factors: IPCC Guidelines, Volume 3, page 1.23, table 1-3).

[b] The percentage values given in this column indicate the share of fuel used for domestic aviation compared to the total fuel used for aviation (domestic and international).

[c] The percentage values given in this column indicate the share of fuel used for international aviation compared to the total fuel used for aviation (domestic and international).

Energy - Transport: Civil Aviation

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		2,555	3,225	3,868	3,648	3,824	4,442	4,831	5,034	4,384
Canada		10,385								12,582
Finland		403								447
Japan		6,846	7,379	7,829	8,274	8,817	9,301	9,225	9,649	10,406
Netherlands								300	300	314
New Zealand		781	663	639	684	839	861	830	811	841
United Kingdom		2,158	2,121	2,221	2,281	2,326	2,448	2,550	2,641	2,764
United States		127,534	117,721	119,723	121,582	124,338	129,402	133,225	138,183	140,217

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	26.2	19.9	-5.7	4.8	16.2	8.8	4.2	-12.9	71.6
Canada									21.2
Finland									11.0
Japan	7.8	6.1	5.7	6.6	5.5	-0.8	4.6	7.9	52.0
Netherlands							0.0	4.7	
New Zealand	-15.2	-3.6	7.1	22.5	2.7	-3.6	-2.3	3.7	7.6
United Kingdom	-1.7	4.7	2.7	2.0	5.2	4.2	3.6	4.7	28.1
United States	-7.7	1.7	1.6	2.3	4.1	3.0	3.7	1.5	9.9

Note:
The following Parties are not included in this table because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - International Bunkers: Aviation

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		4,345	4,520	4,796	5,199	5,354	5,858	6,312	6,540	7,233
Austria		941	1,101	1,172	1,143	1,201	1,332	1,471	1,522	1,835
Belgium									3,912	4,013
Bulgaria	892	892	320	565	739	632	549			280
Canada		2,729	2,483	2,685	2,472	2,461	2,604	3,074	2,992	2,878
Finland		1,800	1,700	2,164	1,694	1,318	1,044	1,181	1,286	1,658
Greece		2,452	2,130	2,206	2,907	2,787	2,613	2,503	2,421	2,449
Hungary			376	154	154	154	154	154	154	556
Ireland		1,116	1,209	1,299	1,379	1,161	1,146	1,269	1,325	1,373
Italy		3,780	3,737	4,346	4,457	4,691	4,926	5,446	5,660	5,683
Japan		13,184	13,849	14,109	14,222	14,885	16,834	18,161	19,095	18,311
Netherlands		4,450	4,960	5,910	6,500	6,720	7,670	8,300	9,000	9,500
New Zealand		1,352	1,293	1,323	1,341	1,444	1,583	1,649	1,724	1,637
Norway		605	542	556	624	621	571	682	760	819
Spain		3,161	3,173	3,557	6,484	5,869	6,211	6,554	7,072	8,518
Sweden		2,045	1,779	1,894	1,926	1,947	1,968	1,302	1,934	1,926
Switzerland		3,200	3,100	3,300	3,440	3,550	3,770	3,900	4,050	4,230
United Kingdom		14,791	14,570	16,121	17,241	17,856	19,012	20,238	21,552	24,122
United States		46,728	46,682	47,143	47,615	48,327	51,093	52,135	55,899	56,917

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	4.0	6.1	8.4	3.0	9.4	7.8	3.6	10.6	66.5
Austria	17.0	6.5	-2.5	5.2	10.8	10.4	3.5	20.6	95.0
Belgium								2.6	
Bulgaria	-64.1	76.5	30.7	-14.4	-13.1				-68.6
Canada	-9.0	8.2	-7.9	-0.5	5.8	18.1	-2.7	-3.8	5.4
Finland	-5.6	27.3	-21.7	-22.2	-20.8	13.1	8.9	28.9	-7.9
Greece	-13.1	3.6	31.8	-4.1	-6.2	-4.2	-3.3	1.2	-0.1
Hungary		-59.1	0.0	0.0	0.0	0.0	0.0	261.4	
Ireland	8.3	7.4	6.2	-15.8	-1.3	10.7	4.5	3.6	23.0
Italy	-1.1	16.3	2.6	5.3	5.0	10.6	3.9	0.4	50.3
Japan	5.0	1.9	0.8	4.7	13.1	7.9	5.1	-4.1	38.9
Netherlands	11.5	19.2	10.0	3.4	14.1	8.2	8.4	5.6	113.5
New Zealand	-4.4	2.3	1.4	7.7	9.6	4.2	4.5	-5.0	21.1
Norway	-10.4	2.5	12.2	-0.5	-8.0	19.4	11.4	7.8	35.4
Spain	0.4	12.1	82.3	-9.5	5.8	5.5	7.9	20.5	169.5
Sweden	-13.0	6.5	1.7	1.1	1.1	-33.8	48.5	-0.4	-5.8
Switzerland	-3.1	6.5	4.2	3.2	6.2	3.4	3.8	4.4	32.2
United Kingdom	-1.5	10.6	6.9	3.6	6.5	6.4	6.5	11.9	63.1
United States	-0.1	1.0	1.0	1.5	5.7	2.0	7.2	1.8	21.8

Note:
The Czech Republic, Latvia, Lithuania and Slovakia are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987).
For these Parties, the values in the column "percentage change from 1990 to 1998" refers to the base year data.

Energy - Domestic and International Marine Transport: Activity data (1998)

	Domestic and International Marine Transport													
	Activity data in CRF based on	1.A.3.d Navigation (Domestic)							International Marine Transport						
		Residual Oil			Gas/Diesel Oil			share of fuel used for domestic[b]	Residual Oil			Gas/Diesel Oil			share of fuel used for international[c]
		CRF	IEA[a]	Difference	CRF	IEA[a]	Difference	CRF	CRF	IEA[a]	Difference	CRF	IEA[a]	Difference	CRF
		(TJ)		(%)	(TJ)		(%)	(%)	(TJ)		(%)	(TJ)		(%)	(%)
Australia	GCV	10,289	10,170	-1.2	2,628	6,870	161.4	42.9	25,450	25,109	-1.3	5,590	5,323	-4.8	57.1
Austria	NCV				783			100.0							
Belgium															
Bulgaria	NCV	42	40	-4.3	84	87	3.7	0.8	10,109			2,703	3,033	12.2	99.2
Canada	GCV	30,254	27,771	-8.2	36,649	35,314	-3.6	56.6	43,211	39,668	-8.2	8,165	7,886	-3.4	43.4
Czech Republic	NCV				434			100.0		0					
Finland	NCV	1,640	1,608	-2.0	1,785	1,820	2.0	13.5	15,129	14,830	-2.0	6,800	6,933	2.0	86.5
Greece	NCV	21,622	21,622	0.0	13,996	15,252	9.0	19.6	112,452	112,452	0.0	32,844	32,844	0.0	80.4
Hungary	NCV				58	43	-25.3	100.0		0					
Ireland	NCV	921	884	-4.0	628	650	3.5	18.6	2,052	2,010	-2.0	4,689	4,680	-0.2	81.4
Italy	NCV				12,227	9,143	-25.2	18.3	71,315	74,231	4.1	24,170	34,317	42.0	81.7
Japan [d]	NCV	NO	121,535		7,611	67,855	791.5	45.1	235,355	221,045	-6.1	797	8,406	954.6	54.9
Latvia															
Lithuania	NCV	40	40	0.5	148	40	-72.8	8.2	1,146	1,166	1.7	949	173	-81.8	91.8
Netherlands	NCV				11,600	28,165	142.8	2.2	434,000	420,307	-3.2	88,000	88,870	1.0	97.8
New Zealand	NCV	NE			NE	5,286			NE	10,168		NE	3,683		100.0
Norway	NCV	731	723	-1.0	35,981	31,934	-11.2	49.0	17,422	17,242	-1.0	20,751	20,322	-2.1	51.0
Slovakia	NCV				2,213			100.0							
Spain															
Sweden	NCV	3,982	1,487	-62.7	3,234	4,030	24.6	11.6	52,250	53,332	2.1	2,700	12,219	352.5	88.4
Switzerland	NCV				973	217	-77.7	100.0					477		
United Kingdom	NCV	4,309	4,059	-5.8	36,784	42,550	15.7	25.9	69,111	67,680	-2.1	48,689	60,489	24.2	74.1
United States	GCV	91,918	2,237	-97.6	585,623			48.5	627,552	700,048	11.6	91,788	308,648	236.3	51.5

Notes:

[a] Data from the International Energy Agency (conversion factors used: for Residual Oil 40.19 TJ/kt and for Gas/Diesel Oil 43.33 TJ/kt, source of conversion factors: IPCC Guidelines, Volume 3, page 1.23, table 1-3).

[b] The percentage values given in this column indicate the share of fuel used for domestic navigation compared to the total fuel used for navigation (domestic and international).

[c] The percentage values given in this column indicate the share of fuel used for international navigation compared to the total fuel used for navigation (domestic and international).

[d] Japan reported consumption of 3 types of heavy oil under other fuels (total consumption 186,066 TJ).

Energy - Transport: Navigation (Domestic)

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		2,224	1,941	1,939	1,741	1,760	1,951	2,008	1,980	1,710
Canada		4,733								4,827
Finland		227								257
Japan		13,353	13,915	13,717	13,567	13,871	14,367	15,235	16,219	14,429
Netherlands								798	847	847
New Zealand		250	258	300	289	366	332	285	210	177
United Kingdom		3,461	3,718	3,557	3,538	3,282	3,102	3,415	3,252	3,001
United States		55,290	52,825	67,678	63,386	62,185	62,394	66,521	50,176	45,707

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-12.7	-0.1	-10.2	1.1	10.8	2.9	-1.4	-13.7	-23.1
Canada									2.0
Finland									13.1
Japan	4.2	-1.4	-1.1	2.2	3.6	6.0	6.5	-11.0	8.1
Netherlands							6.1	0.0	
New Zealand	3.0	16.3	-3.5	26.3	-9.2	-14.3	-26.1	-15.9	-29.3
United Kingdom	7.4	-4.3	-0.6	-7.2	-5.5	10.1	-4.8	-7.7	-13.3
United States	-4.5	28.1	-6.3	-1.9	0.3	6.6	-24.6	-8.9	-17.3

Note:
The following Parties are not included in this table because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Slovakia, Spain, Sweden and Switzerland.

Energy - International Bunkers: Marine

Trends in CO2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		2,056	1,858	1,789	1,788	1,886	2,675	2,719	2,519	2,240
Belgium									17,605	18,070
Bulgaria	874	874	878	873	844	850	882			1,233
Canada		2,995	3,099	3,181	2,838	3,189	3,312	3,086	3,046	3,776
Finland		974	900	811	762	802	868	957	965	990
Greece		8,028	7,368	8,422	9,819	10,470	11,214	9,864	9,891	11,059
Ireland		56	107	54	171	125	368	497	484	503
Italy		8,651	8,467	8,009	7,695	7,670	7,491	7,651	7,231	7,523
Japan		17,621	19,187	19,987	22,465	22,609	20,494	14,259	17,543	18,687
Netherlands		35,560	36,330	36,490	37,780	36,140	36,480	37,200	39,530	39,830
New Zealand		1,032	912	866	915	1,324	1,125	1,062	1,112	1,062
Norway		1,478	1,252	1,567	1,677	1,846	2,256	2,480	3,080	2,899
Spain		11,780	12,496	12,655	11,079	10,027	10,296	15,029	18,536	19,551
Sweden		2,162	2,552	2,922	2,929	3,453	3,399	3,597	4,266	5,084
United Kingdom		6,559	6,340	6,640	6,573	6,150	6,599	7,210	8,064	8,788
United States		71,237	73,337	62,822	52,270	49,690	49,921	50,062	53,889	57,783

Relative Change to Previous Year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-9.6	-3.8	0.0	5.5	41.8	1.6	-7.3	-11.1	9.0
Belgium								2.6	
Bulgaria	0.5	-0.6	-3.3	0.8	3.8				41.0
Canada	3.5	2.7	-10.8	12.4	3.9	-6.9	-1.3	24.0	26.1
Finland	-7.6	-9.9	-6.0	5.3	8.3	10.2	0.8	2.6	1.6
Greece	-8.2	14.3	16.6	6.6	7.1	-12.0	0.3	11.8	37.8
Ireland	89.9	-49.9	219.5	-26.9	194.3	35.2	-2.7	3.8	793.4
Italy	-2.1	-5.4	-3.9	-0.3	-2.3	2.1	-5.5	4.0	-13.0
Japan	8.9	4.2	12.4	0.6	-9.4	-30.4	23.0	6.5	6.0
Netherlands	2.2	0.4	3.5	-4.3	0.9	2.0	6.3	0.8	12.0
New Zealand	-11.6	-5.0	5.6	44.7	-15.0	-5.5	4.7	-4.5	3.0
Norway	-15.3	25.1	7.0	10.1	22.2	10.0	24.2	-5.9	96.2
Spain	6.1	1.3	-12.4	-9.5	2.7	46.0	23.3	5.5	66.0
Sweden	18.0	14.5	0.2	17.9	-1.6	5.8	18.6	19.2	135.2
United Kingdom	-3.3	4.7	-1.0	-6.4	7.3	9.3	11.9	9.0	34.0
United States	2.9	-14.3	-16.8	-4.9	0.5	0.3	7.6	7.2	-18.9

Note:
The Czech Republic, Hungary, Latvia, Lithuania and Slovakia are not included in this table because data for years other than 1998 were not reported. Austria and Switzerland reported zero.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987).
For these Parties, the values in the column "percentage change from 1990 to 1998" refers to the base year data.

Energy - Fugitive emissions from fuels: coal mining and handling (1998)

	1.B.1 Fugitive Emissions from Solid Fuels (CH_4)												
	Key source	percent of national total	Methods and EF used [c]		1.B.1.a Coal Mining and Handling								
					Activity data					CH_4 IEF			
					CRF			IEA[a]	Difference	Underground mines		Surface mines	
			Methods	EF	Underground mines	Surface mines	Total	Total		Mining activities	Post-mining activities	Mining activities	Post-mining activities
		(%)			(Mt)				(%)	(kg/t)			
IPCC Default EF[b]										**4.50-16.75**	**0.60-2.68**	**0.20-1.34**	**0-0.13**
Australia	L	3.9	T2	CS	78.8	187.7	266.5	284.6	6.8	7.66	0.39	1.36	NA
Austria			C	CS		1.1	1.1	1.1	0.9			0.01	NE
Belgium													
Bulgaria	L	1.6	T1	D	3.0	27.1	30.1	30.1	0.0	11.73	1.68	0.80	0.07
Canada			CS	CS	3.9	91.5	95.4	75.4	-21.0	7.70	IE	0.38	IE
Czech Republic	L	3.6	T3	CS	15.9	48.6	64.5	67.5	4.7	11.83	1.56	0.77	0.07
Finland			CS	CS									
Greece			T1	IPCC	NA	60.9	60.9	60.9	0.0	NO	NO	0.78	0.07
Hungary	L	2.4	D	D	6.5	8.6	15.1	14.7	-2.8	11.72	1.68	0.80	0.07
Ireland			NA	NA	NO	NO				NO	NO	NO	NO
Italy						0.0	0.0	0.2					
Japan			T2	CS	3.1	0.6	3.7	3.7	-0.9	15.10	0.60	0.77	0.07
Latvia								0.0					
Lithuania								0.0					
Netherlands					NO	NO				NO	NO	NO	NO
New Zealand	L	0.7	T1	CS/D	0.9	2.4	3.3	3.3	-0.1	22.83	1.60	0.77	0.07
Norway			T1	D	0.3		0.3	0.3	-0.1	14.00			
Slovakia	L	1.1	IPCC	IPCC	4.0		4.0	4.0	0.0	6.70	0.30		
Spain								26.0					
Sweden													
Switzerland					0.0	0.0	0.0	0.0					
United Kingdom	L	0.8	T2	CS	25.0	15.0	40.0	40.0	0.0	9.17	1.16	0.34	IE
United States	L	1.0	T2/3	CS	377.4	637.0	1014.4	1013.4	-0.1	5.25	1.58	0.71	0.11

Notes:

[a] Data from the International Energy Agency (sum of total indigenous production of hard coal and brown coal).

[b] Range of default emission factors for the IPCC Tier 1 approach (source: IPCC Guidelines, Volume 3, pages 1.105-1.110).

[c] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factors for all subcategories within the category "1.B.1 Solid fuels".

Energy - Fugitive Emissions from Fuels: Solid fuels

Trends in CH_4 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		757.3	760.4	789.8	787.0	758.6	795.8	837.2	807.7	889.3
Austria		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Belgium									13.2	13.2
Bulgaria	91.9	75.8	65.1	71.5	71.4	66.7	69.2			63.7
Canada		91.2	99.4	87.4	87.3	84.1	81.6	84.1	78.1	65.0
Finland		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Greece		44.1	44.8	46.8	46.6	48.2	49.0	50.8	50.0	51.8
Hungary	222.9	167.0	160.6	124.4	109.5	104.8	105.9	107.8	107.7	94.3
Italy		5.1	5.1	4.3	4.0	3.4	3.2	3.1	2.9	2.9
Japan		107.4	107.4	106.8	101.0	94.2	88.9	87.2	52.6	49.6
New Zealand		11.8	10.6	10.9	11.0	13.2	19.8	30.0	18.7	24.7
Norway		4.2	4.6	5.0	3.8	4.2	4.1	3.2	5.4	4.6
Slovakia		33.4	29.0	24.7	24.8	25.4	26.3	26.8	27.4	27.7
Spain		107.6	101.2	101.1	96.7	90.8	90.1	87.8	78.6	74.8
United Kingdom		828.7	847.2	811.9	525.5	334.9	368.8	346.6	326.7	271.6
United States		4,183.7	3,975.4	3,834.9	3,355.8	3,389.9	3,550.0	3,301.0	3,274.1	3,104.2

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.4	3.9	-0.4	-3.6	4.9	5.2	-3.5	10.1	17.4
Austria	-50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-50.0
Belgium									
Bulgaria	-14.1	9.8	-0.2	-6.6	3.7				-30.6
Canada	9.0	-12.1	0.0	-3.7	-3.0	3.1	-7.2	-16.8	-28.8
Finland			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Greece	1.5	4.5	-0.4	3.4	1.8	3.6	-1.6	3.5	17.3
Hungary	-3.8	-22.6	-12.0	-4.3	1.0	1.7	-0.1	-12.4	-57.7
Italy	0.8	-16.1	-6.3	-15.1	-7.6	-2.8	-4.9	-1.0	-43.1
Japan	0.1	-0.5	-5.4	-6.8	-5.7	-1.8	-39.8	-5.6	-53.8
New Zealand	-10.6	3.1	0.5	20.4	49.8	51.5	-37.6	32.2	109.0
Norway	9.0	8.7	-25.3	12.5	-3.1	-21.5	68.5	-15.2	8.3
Slovakia	-13.2	-14.8	0.4	2.4	3.5	1.9	2.2	1.1	-17.1
Spain									
United Kingdom	2.2	-4.2	-35.3	-36.3	10.1	-6.0	-5.8	-16.9	-67.2
United States	-5.0	-3.5	-12.5	1.0	4.7	-7.0	-0.8	-5.2	-25.8

Note:
The Czech Republic, Latvia, Lithuania, the Netherlands and Sweden are not included in this table because data for years other than 1998 were not reported. Ireland and Switzerland reported zero.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987).
For these Parties, the values in the column "percentage change from 1990 to 1998" refers to the base year data.

Energy - Fugitive emissions from fuels: Oil and Natural Gas (1998)

	1.B.2 Fugitive emissions from Oil and Natural Gas (CH_4)																	
	Key source	percent of national total	Methods and EF used[a]		1.B.2.a Oil						1.B.2.b Natural gas							
					CH_4 IEF						CH_4 IEF							
					Production		Transport		Refining (R)/ Storage (S)		Production/Processing [b]		Transmission [b]		Distribution [b]		Other leakage [b]	
		(%)	Methods	EF	value	unit	value	unit	value	unit	value	unit	value	unit	value	unit	value	unit
IPCC Default EF [c]					**300-5,000**	**kg/PJ**	**745**	**kg/PJ**	**90-1,400 (R) 20-250 (S)**	**kg/PJ**	**46,000-314,000**	**kg/PJ**	**57,000-628,000**	**kg/PJ**	**57,000-288,000**	**kg/PJ**	**0-384,000**	**kg/PJ**
Australia	L	1.4	T2	CS	209	kg/PJ	745	kg/PJ	1,119	kg/PJ	1,295	kg/PJ	8,499	kg/PJ	503,765	kg/PJ	NE	
Austria			C	CS	NE		NE		NE		NE				698	kg/Mm^3 GAS		
Belgium																		
Bulgaria	L	2.7	T1	D	2,650	kg/PJ	745	kg/PJ	745	kg/PJ	227,000	kg/PJ	500,000	kg/PJ				
Canada	L	5.4	CS	CS	6,661	kg/10^3 km^3			NE		1,707	kg/10^6 m^3	3,240	kg/10^6 m^3	744	kg/10^6 m^3	NA	
Czech Republic			T1, T3	D,CS	5,190	kg/PJ			1,400	kg/PJ	51,923	kg/PJ	17,251	kg/PJ				
Finland			CS	PS													1,000	kg/t
Greece			C	C	3	kg/GJ					NO		NO		NO		NO	
Hungary	L	7.7	T1	D	2,600	kg/PJ			750	kg/PJ	250,000	kg/PJ	458,000	kg/PJ				
Ireland			T1	CS	NO		NO		NO		NE		NE		100,162	kg/PJ	NO	
Italy	L	1.1																
Japan			T1	D	2,650	kg/PJ	NO		880	kg/PJ	49,500	kg/PJ	95,000	kg/PJ	NO		NO	
Latvia													0.5[d]	kg/PJ				
Lithuania	L	1.5	RA, T1	D,CS	3,000	kg/PJ	713	kg/PJ							117,984	kg/PJ		
Netherlands	L	1.3	CS	CS											86,000	kg/PJ		
New Zealand	L	0.9	T1	CS/D	NA		NA				NA		195,284	kg/PJ	NA		NA	
Norway	L	1.0	CS	CS			2,596	kg/PJ										
Slovakia	L	3.8	IPCC, T1	IPCC	2,650	kg/PJ			745	kg/PJ	67,000	kg/PJ	5,000	kg/PJ			340,000	kg/PJ
Spain																		
Sweden																		
Switzerland			C	CS					1,023	kg/PJ					123,145	kg/PJ		
United Kingdom	L	1.4	T3	CS	5,602	kg/PJ	1,813	kg/PJ	43	kg/PJ	IE		IE		123,374	kg/PJ	NE	
United States	L	2.2	T3	CS	471,038	kg/MM Bbl/yr	2,601	kg/MM Bbl/yr	11,840	kg/MM Bbl/yr	110,627	kg/bill ft^3/yr	110,387	kg/bill ft^3/yr	66,307	kg/bill ft^3/yr	IE	

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factors used for all sub-categories within the category "1.B.2 Oil and natural gas".

[b] The units for the IEF vary from Party to Party depending on the unit of the activity data used.

[c] Source of default emission factors: IPCC Guidelines, Vol. 3, pages 1.119-1.121. Emission factors (in kg/PJ) for Natural Gas activities by regions are provided in the table below.

	Basis	Western Europe	US & Canada	Former USSR, Central and Eastern Europe	Rest of the World
Fugitive and Other Maintenance Emissions from	Gas Produced	15,000-27,000	46,000-84,000	140,000-314,000	46,000-96,000
Emissions from Processing, Distribution and Transmission	Gas Produced			288,000-628,000	288,000 (high)
	Gas Consumed	72,000-133,000	57,000-118,000		118,000 (low)

[d] The imbedded formula in the CRF was overwritten. If the formula were used the value of the IEF would be approximately 500,000 kg/PJ.

Energy - Fugitive emissions from fuels: Oil and Natural Gas (1998) *continued*

	Fugitive emissions from Oil and Natural Gas (CH_4)									
	1.B.2.d Venting and Flaring									
	CH_4 IEF									
	Oil		Gas				Combined			
	Venting[a]		Venting[a]		Flaring[a]		Venting[a]		Flaring[a]	
	value	unit	value	unit	value	unit	value	unit	value	unit
IPCC Default EF[b]	**1,000-3000**	**kg/PJ**	**6,000-209,000**			**kg/PJ**	**3,000-14,000**			**kg/PJ**
Australia	NA		94,016	kg/PJ	NE		NA		10,059	kg/PJ
Austria										
Belgium										
Bulgaria	18,000	kg/PJ	2,000	kg/PJ	NE		NE		NE	
Canada	NA		NA		NA		NA		142	$kg/10^6\ m^3$
Czech Republic										
Finland	NE									
Greece										
Hungary										
Ireland	NO		NE		NE		NO		NO	
Italy										
Japan	NO		NO		NO	-	NO		NO	
Latvia										
Lithuania										
Netherlands										
New Zealand	NA		NA		NA		NA		NA	
Norway					23,999	kg/PJ	1,023	kg/PJ		
Slovakia										
Spain										
Sweden										
Switzerland	227	kg/PJ								
United Kingdom	IE		IE		IE		IE		310,201	kg/PJ
United States	IE		IE		IE		IE		IE	

[a] The units for the IEF vary from Party to Party depending on the unit of activity data used.

[b] Source of default emission factors: IPCC Guidelines, Vol. 3, p. 1.119-1.121. Emission factors (in kg/PJ) for Venting & Flaring from Gas Production by regions are provided in the table below.

	Basis	Former USSR, Central & Eastern Europe	Rest of the world
Venting & Flaring	Gas Produced	6,000-30,000	175,000-209,000

Energy - Fugitive Emissions from Fuels: Oil and natural gas

Trends in CH_4 Emissions from Oil and Natural Gas, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		327.3	293.6	312.7	272.2	276.6	329.7	306.5	334.7	327.9
Austria		4.3	4.5	4.4	4.7	4.8	5.2	5.6	5.4	5.5
Belgium									35.5	35.5
Bulgaria	166.7	176.7	151.1	133.2	125.0	125.6	150.4			107.8
Canada		1,246.7	1,305.4	1,423.8	1,485.7	1,571.8	1,671.2	1,785.2	1,787.1	1,774.3
Finland		0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.4	0.4
Greece		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Hungary	225.4	199.0	292.1	259.0	275.7	274.3	292.5	317.4	299.7	305.2
Ireland		6.1	5.8	5.5	5.3	5.0	4.8	4.7	4.6	4.0
Italy		331.2	326.8	313.9	302.8	288.6	280.0	280.6	283.4	282.5
Japan		52.4	57.1	60.5	65.1	67.1	71.4	74.4	77.8	79.2
Netherlands		178.8	188.1	163.1	158.0	168.5	174.0	177.5	158.9	149.6
New Zealand		15.0	14.3	13.7	13.4	14.2	13.7	14.8	17.0	18.3
Norway		13.6	15.3	19.7	23.0	24.5	24.7	24.8	28.0	25.4
Slovakia		88.2	84.6	77.8	81.1	80.4	87.1	91.4	92.5	94.3
Spain		50.0	55.3	58.3	56.5	61.3	71.6	81.5	97.3	103.4
Switzerland		14.6	14.5	14.2	13.8	13.3	12.8	12.7	12.6	12.5
United Kingdom		540.2	523.3	521.0	508.5	506.5	502.6	489.1	476.7	466.0
United States		7,063.7	7,146.5	7,185.8	7,248.5	7,162.8	7,098.4	7,184.3	7,103.1	6,967.6

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-10.3	6.5	-13.0	1.6	19.2	-7.0	9.2	-2.0	0.2
Austria	5.7	-1.8	5.5	2.9	9.2	6.4	-3.6	2.6	29.4
Belgium								0.0	
Bulgaria	-14.5	-11.8	-6.2	0.5	19.8	-100.0			-35.4
Canada	4.7	9.1	4.3	5.8	6.3	6.8	0.1	-0.7	42.3
Finland	0.0	0.0	0.0	0.0	0.0	194.0	-30.3	-2.4	100.0
Greece	1.1	-15.8	-20.0	-6.3	-13.3	11.5	-8.6	-32.1	-61.7
Hungary	46.8	-11.3	6.4	-0.5	6.6	8.5	-5.6	1.8	35.4
Ireland	-4.3	-4.3	-4.5	-4.7	-4.0	-2.7	-2.5	-12.2	-33.4
Italy	-1.3	-4.0	-3.5	-4.7	-3.0	0.2	1.0	-0.3	-14.7
Japan	9.1	6.0	7.6	3.0	6.4	4.2	4.5	1.8	51.3
Netherlands	5.2	-13.3	-3.1	6.6	3.3	2.0	-10.5	-5.9	-16.3
New Zealand	-4.5	-4.6	-1.9	5.5	-3.3	8.0	14.7	7.7	21.7
Norway	12.1	28.6	17.2	6.3	0.9	0.6	12.9	-9.4	86.3
Slovakia	-4.1	-8.0	4.2	-0.9	8.3	4.9	1.2	2.0	7.0
Spain	10.6	5.5	-3.2	8.6	16.7	13.8	19.4	6.2	106.7
Switzerland	-1.2	-2.0	-2.8	-3.6	-3.7	-0.8	-0.8	-0.8	-14.7
United Kingdom	-3.1	-0.5	-2.4	-0.4	-0.8	-2.7	-2.5	-2.2	-13.7
United States	1.2	0.6	0.9	-1.2	-0.9	1.2	-1.1	-1.9	-1.4

Note:
The Czech Republic, Latvia, Lithuania and Sweden are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987).
For these Parties, the values in the column "percentage change from 1990 to 1998" refer to the base year data.

2. Industrial Processes

Industrial processes - Mineral products, CO_2 (1998)

	2.A Mineral products												
	Methods and EF used[a]		2.A.1 Cement production							2.A.2 Lime production[e]	2.A.3 Limestone and dolomite use		
	Methods	EF	Key source	percent of national total	Activity data (production)				CO_2 IEF	CO_2 IEF	Key source	percent of national total	CO_2 IEF
					Description[b]	CRF	U.N.[c]	Difference[d]					
				%		kt	kt	%	t / t	t / t		%	t / t
IPCC Default EF [f]									0.499 (cement)	0.79 - 0.91			0.44 -0.48
IPCC Default EF [f]									0.507 (clinker)				
Australia	T2	CS	L	3.0	Clinker	6,232	6,952	11.55	0.518	0.69			0.41
Austria	C, CS	CS			Cement	3,800	3,944	3.79	0.656	0.37			
Belgium							6,929						
Bulgaria	D	D	L	1.0	Cement	1,742	1,742	-0.02	0.499	0.79			0.48
Canada	T1	CS	L	1.0	Cement	12,064	12,064	0.00	0.500	0.79			0.57
Czech Republic	T1	D	L	2.0	Cement	4,874	4,604	-5.54	0.499				
Finland	D	PS/D	L	1.0	Cement	1,232	960	-22.09	0.471	0.79			NE
Greece	C	C	L	6.0	Cement	14,800	13,660	-7.70	0.499	0.79			NE
Hungary	D	D	L	2.0	Cement	2,999	2,999	0.01	0.500	0.79			
Ireland	D	D	L	2.0	Clinker	2,000	2,000	0.00	0.500	0.75			NO
Italy			L	3.0		27,328	35,512	29.95	0.600	0.79			
Japan	D	D				IE	81,328		IE	IE	L	3.8	0.43
Latvia					Cement	366	366	0.00	0.498	0.79			0.44
Lithuania	RA, T1	D, C	L	2.0		788	788	-0.04	0.499	0.79	L	5.6	0.46
Netherlands	CS	PS, CS					3,300						
New Zealand	T1	CS			Cement	955	976	2.16	0.501	0.69			NE
Norway	D	CS	L	2.0		C	1,690						
Slovakia	IPCC	IPCC	L	2.0		2,875	3,066	6.64	0.411	0.79	L	5.8	0.44
Spain							27,860						
Sweden	CS	CS	L	2.0		3,486	2,372	-31.96	0.440	0.79			
Switzerland	C	C	L	4.0	Cement	3,450	4,000	15.94	0.590	0.37			
United Kingdom	T1	D	L	1.0	Clinker	12,372	14,995	21.20	0.507	0.44			0.45
United States	D,CS	D,CS			Clinker	75,859	83,931	10.64	0.517	0.68			0.45

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "2.A Mineral products".

[b] The CRF requests Parties to specify the activity data used (e.g. cement or clinker) for estimating the emissions from cement production.

[c] Cement production from Monthly Bulletin of Statistics, Department of Economic and Social Affairs, Statistics Division, United Nations, New York, Vol.LIV, no. 12, December 2000.

[d] As the U.N. data given in this table are for cement production, the comparisons with the CRF data specified as clinker are likely to differ

[e] Lime production was not a key source for any Party.

[f] Source of default emission factors: IPCC Guidelines, Volume 3, pages 2.6, 2.9 and 2.10.

Industrial processes - mineral products

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		4,827	4,503	4,389	4,598	5,238	5,123	5,147	5,078	5,471
Austria		3,318	3,277	3,429	3,289	3,415	2,730	2,727	2,801	2,716
Belgium									5,200	5,200
Bulgaria	4,629	4,264	2,472	1,979	1,746	1,917	2,328			1,410
Canada		8,161	6,981	6,636	6,875	7,507	7,691	8,034	8,168	8,361
Finland		1,130	1,000	1,025	858	840	810	840	900	921
Greece		6,984	6,979	7,022	7,253	7,046	7,392	7,621	7,774	7,924
Hungary	3,587	3,568	1,265	1,118	1,267	1,397	1,438	1,548	1,587	1,971
Ireland		941	924	962	932	1,085	1,068	1,080	1,190	1,192
Italy		22,715	22,587	22,939	19,300	18,858	19,422	19,107	19,342	19,973
Japan		55,418	57,055	57,643	57,150	57,913	57,909	57,626	56,135	50,754
Netherlands		730	700	750	1,050	1,050	1,130	900	1,100	1,100
New Zealand		449	437	500	553	566	586	581	598	566
Norway		683	629	689	875	884	917	903	969	916
Slovakia	5,546	5,546	4,125	4,645	4,262	4,516	4,720	4,499	4,734	4,770
Spain		14,289	13,756	12,542	11,878	13,835	14,809	14,482	18,285	20,506
Sweden		2,018	2,021	1,977	1,948	2,013	2,676	1,953	1,850	1,977
United Kingdom		9,419	8,049	7,518	7,561	8,331	8,437	8,668	9,491	9,598
United States		53,627	52,357	52,630	54,225	57,534	60,767	62,030	64,728	66,033

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-6.7	-2.5	4.8	13.9	-2.2	0.5	-1.3	7.7	13.3
Austria	-1.2	4.7	-4.1	3.8	-20.1	-0.1	2.7	-3.0	-18.1
Belgium								0.0	
Bulgaria	-42.0	-20.0	-11.8	9.8	21.5	-100.0			-66.9
Canada	-14.5	-4.9	3.6	9.2	2.5	4.5	1.7	2.4	2.5
Finland	-11.5	2.5	-16.3	-2.1	-3.6	3.7	7.1	2.4	-18.4
Greece	-0.1	0.6	3.3	-2.9	4.9	3.1	2.0	1.9	13.5
Hungary	-64.6	-11.6	13.3	10.3	2.9	7.6	2.6	24.2	-44.7
Ireland	-1.9	4.1	-3.1	16.4	-1.6	1.2	10.2	0.2	26.6
Italy	-0.6	1.6	-15.9	-2.3	3.0	-1.6	1.2	3.3	-12.1
Japan	3.0	1.0	-0.9	1.3	0.0	-0.5	-2.6	-9.6	-8.4
Netherlands	-4.1	7.1	40.0	0.0	7.6	-20.4	22.2	0.0	50.7
New Zealand	-2.7	14.4	10.6	2.4	3.5	-0.9	2.9	-5.4	26.1
Norway	-8.0	9.7	26.9	1.0	3.7	-1.5	7.2	-5.4	34.1
Slovakia	-25.6	12.6	-8.3	6.0	4.5	-4.7	5.2	0.8	-14.0
Spain	-3.7	-8.8	-5.3	16.5	7.0	-2.2	26.3	12.1	43.5
Sweden	0.1	-2.2	-1.5	3.3	32.9	-27.0	-5.3	6.9	-2.0
United Kingdom	-14.5	-6.6	0.6	10.2	1.3	2.7	9.5	1.1	1.9
United States	-2.4	0.5	3.0	6.1	5.6	2.1	4.3	2.0	23.1

Note:
The following Parties are not included in these tables because data for years other than 1998 were not reported:
Czech Republic, Latvia, Lithuania and Switzerland.

Cement production
Trends in CO_2 emissions , 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		3,168.1	2,899.8	2,734.5	2,831.4	3,180.5	3,162.9	3,001.8	2,944.3	3,228.2
Belgium									3,398.0	3,398.0
Canada		5,872.5								6,032.0
Finland		777.5								580.9
New Zealand		366.7	343.3	405.4	461.2	486.8	503.3	502.8	503.4	478.7
United Kingdom		6,693.2	5,499.5	5,006.1	5,069.0	5,842.3	5,766.2	5,886.9	6,156.7	6,273.8
United States		33,278.3	32,535.2	32,791.8	34,623.6	36,086.5	36,847.1	37,079.3	38,323.5	39,226.6

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-8.5	-5.7	3.5	12.3	-0.6	-5.1	-1.9	9.6	1.9
Belgium								0.0	
Canada									2.7
Finland									-25.3
New Zealand	-6.4	18.1	13.7	5.6	3.4	-0.1	0.1	-4.9	30.6
United Kingdom	-17.8	-9.0	1.3	15.3	-1.3	2.1	4.6	1.9	-6.3
United States	-2.2	0.8	5.6	4.2	2.1	0.6	3.4	2.4	17.9

Trends in CO_2 implied emission factors, 1990 to 1998 (t/t)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia			0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Belgium										
Canada		0.5								0.5
Finland		0.47								0.47
New Zealand		0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.49	0.5
United Kingdom		0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
United States		0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Belgium									
Canada									0.00
Finland									0.00
New Zealand	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.02	-0.02
United Kingdom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
United States	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note:
The following Parties are not included in these tables because numerical information for years other than 1998 was not reported:
Austria, Bulgaria, Czech Republik, Greece, Hungary, Japan, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Industrial processes - Chemical industry, CO_2 and N_2O (1998)

	2.B Chemical industry																		
	Methods and EF used [a]		CO_2						Methods and EF used [d]		N_2O								
			2.B.1 Ammonia production								2.B.2 Nitric acid production						2.B.3 Adipic acid production		
	Method	EF	Key source	percent of national total	Activity data (production)			CO_2 IEF	Methods	EF	Key source	percent of national	Activity data (production)			N_2O IEF	Key source	percent of total	N_2O IEF
					CRF	U.N. [b,c]	Difference						CRF	U.N. [e]	Difference				
				%	kt	kt	%	t / t				%	kt	kt	%	t / t		%	t / t
IPCC Default EF [f]								1.5 - 1.6								0.002 - 0.009			0.264 - 0.3
Australia	NE	NA			NE	450			T1	D			300			0.006			NO
Austria	C	PS			473			0.86	C	PS			484			0.001			
Belgium						287										0.006			
Bulgaria	T1b	D			527	527	0.01	0.86	D	D	L	1.1	521	521	0.06	0.006			NO
Canada	T1	CS			4,737	4,737	0.00	0.82	NA	NA			935	935	-0.04	0.003	L	0.7	NA
Czech Republic	IE				365	324	-11.23		T2	PS	L	0.8	533	433	-18.69	0.007			
Finland					NO	-			D	PS	L	1.7	452			0.009			NO
Greece	C	C			C				C	C			402			0.004			NA
Hungary	D	D			6	293	4492.48	1.50	D	D			1			0.006			
Ireland	D,T1a	D	L	1.7	460	465	1.09	2.30	D	CS	L	1.3	260			0.010			NO
Italy					750	445	-40.67	2.88					479				L	1.1	0.174
Japan	D	CS			C	1,689		NE	D	CS, PS			631	631	0.03	0.004			0.250
Latvia																			
Lithuania	RA, T1	D, C	L	3.1	501	496	-0.90	1.50	RA, T1	D, C	L	12.0	488			0.019			
Netherlands	NO					2,500			T1, CS	CS (=T1)									
New Zealand	T1	CS			163	80	-50.98	0.00					NA						NA
Norway	D	CS,D	L	0.9	C	279			CS3)	PS	L	3.0							
Slovakia						311			IPCC	CS			420			0.001			
Spain						579								465					
Sweden	CS	CS							C	CS	L	1.0	401	90	-77.53				
Switzerland	C	C							C	C			65			0.005			
United Kingdom	T1	CS			43	642	1385.42	25.69	PS	CS			2,496			0.004	L	2.2	0.293
United States	D	D			17,920	14,700	-17.97	1.50	D	CS,PS			8,504	8,423	-0.95	0.008			0.027

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "2.B Chemical industry".

[b] Source of ammonia production data: 1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[c] Data for Australia, Ireland, Italy, the Netherlands, New Zealand, Norway, and the United Kingdom are for 1997

[d] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for all subcategories within the category "2.B Chemical industry".

[e] Source of nitric acid production data: 1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[f] Source of default emission factors: IPCC Guidelines, Volume 3, pages 2.16, 2.18 and 2.19.

Industrial process - chemical industry

Ammonia production

Trends in CO2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Belgium									653	653
Canada		3,127								3,898
Japan		3,377	3,327	3,356	3,183	3,391	3,328	3,453	3,366	3,055
United Kingdom		1,358	1,358	1,379	1,379	1,379	1,379	1,379	888	1,111
United States		23,138	23,364	24,391	23,399	24,316	23,682	24,390	24,346	26,880

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Belgium								0.0	
Canada									24.7
Japan	-1.5	0.9	-5.1	6.5	-1.8	3.8	-2.5	-9.2	-9.5
United Kingdom	0.0	1.5	0.0	0.0	0.0	0.0	-35.6	25.0	-18.2
United States	1.0	4.4	-4.1	3.9	-2.6	3.0	-0.2	10.4	16.2

Trends in CO_2 implied emission factors, 1990 to 1998 (t/t)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Belgium										
Canada		0.84								0.82
Japan		NE	NE	NE	NE	NE	NE	NE	NE	NE
United Kingdom		29.13	28.36	28.58	28.58	28.58	28.58	28.58	22.33	25.69
United States		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Belgium									
Canada									-2.4
Japan									
United Kingdom	-2.6	77.6	0.0	0.0	0.0	0.0	-21.9	15.0	-11.8
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note:
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Australia, Austria, Bulgaria, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, New Zealand, Norway, Slovakia, Spain, Sweden and Switzerland.

Nitric acid production:

Trends in N_2O emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		1.62	1.51	1.83	1.60	1.39	1.40	1.56	1.56	1.65
Canada		2.51								2.49
Finland		5.15								4.26
Japan		2.47	2.46	2.48	2.44	2.50	2.46	2.40	2.32	2.55
United Kingdom		12.81	12.80	12.89	12.80	14.03	9.73	10.01	9.45	11.10
United States		57.57	57.53	59.05	59.90	63.24	64.16	66.81	68.46	68.03

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-6.8	21.2	-12.6	-13.1	0.7	11.4	0.0	5.8	1.9
Canada									-0.8
Finland									-17.3
Japan	-0.4	0.8	-1.6	2.5	-1.6	-2.4	-3.3	9.9	3.2
United Kingdom	-0.1	0.7	-0.7	9.6	-30.6	2.9	-5.6	17.5	-13.3
United States	-0.1	2.6	1.4	5.6	1.5	4.1	2.5	-0.6	18.2

Note:
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, New Zealand, Norway, Slovakia, Spain, Sweden and Switzerland.

Adipic acid production

Trends in N2O emissions 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		NA	NA	NA	NA	NA	NA/NO	NA	NA/NO	NA/NO
Canada		34.58								16.34
Japan		21.45	19.38	19.11	18.72	21.51	21.31	24.24	25.81	22.27
United Kingdom		81.09	75.00	57.85	47.25	57.22	51.32	55.22	57.31	48.28
United States		59.03	61.93	56.87	61.46	65.47	65.58	67.07	55.20	23.40

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia									
Canada									-52.7
Japan	-9.7	-1.4	-2.0	14.9	-0.9	13.7	6.5	-13.7	3.8
United Kingdom	-7.5	-22.9	-18.3	21.1	-10.3	7.6	3.8	-15.8	-40.5
United States	4.9	-8.2	8.1	6.5	0.2	2.3	-17.7	-57.6	-60.4

Trends in N_2O implied emission factors, 1990 to 1998 (t/t)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia										
Canada										
Japan		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
United Kingdom		0.31	0.28	0.28	0.3	0.33	0.33	0.36	0.37	0.29
United States		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.06	0.03

Relative Change to Previous Year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia									
Canada									
Japan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
United Kingdom	-9.7	0.0	7.1	10.0	0.0	9.1	2.8	-21.6	-6.5
United States	0.0	0.0	0.0	0.0	0.0	0.0	-25.0	-50.0	-62.5

Note:
The following Parties are not included in these tables because numerical information for years other than 1998 was not reported:
Austria, Belgium, Bulgaria, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, New Zealand, Norway, Slovakia, Spain, Sweden and Switzerland.

Industrial processes - Metal production, CO_2 (1998)

	2.C Metal production																			
	Methods and EF used [a]		2.C.1 Iron & steel [b]												2.C.3 Aluminium production					
						2.C.1.1 Steel				2.C.1.2 Pig Iron							Activity data (production)			
						Activity data (production)				Activity data (production)										
	Methods	EF	Key source	percent of national total	CO_2 IEF	CRF	U.N.[c]	Difference	CO_2 IEF	CRF	U.N.[d]	Difference	CO_2 IEF	Key source	percent of national total	CRF	U.N.[e]	Difference	CO_2 IEF
				%	t / t	kt	kt	%	t / t	kt	kt	%	t / t		%	kt	t	%	t / t
IPCC Default EF [f]					1.5 - 1.6														1.5 - 1.8
Australia	T2	CS				8,356	8,088	-3.21	NA	NA	7,716					1,589	1,617,600	1.80	1.5
Austria	C	CS, PS	L	10.4		4,707	6,525	38.61			4,021								
Belgium							11,425				8,616								
Bulgaria	D	D	L	2.2		2,238	2,237	-0.04	0.82	1,390	1,500	7.90				7			1.7
Canada	CS	CS	L	1.2		NA	15,800			NA	8,937					2,339	2,374,100	1.49	1.6
Czech Republic	IE					7,059	6,061	-14.14		5,276	4,980	-5.61							
Finland					IE	IE	3,929			2,878	2,916	1.32				NO			
Greece	C	C				NA	1,104			NA						C	146,400		
Hungary	T1b	D					1,940				1,259					92	92,200	0.01	1.9
Ireland	NA	NA			NE	NE	355			NE						NE			
Italy						25,782	25,782	0.00		10,792	10,516	-2.56				201	187,000	-6.97	1.6
Japan	-	-			IE	IE	93,548		IE	IE	74,279		IE			NE	51,400		NE
Latvia							471												
Lithuania							1												
Netherlands	NO						6,377				5,562						263,700		
New Zealand	T1	CS	L	1.9	1.96	740	700	-5.37	2.0	NA				L	0.7	318	317,500	-0.03	1.7
Norway	D, CS3)	D, PS					639			C	70			L	3.1	965	995,500	3.15	1.8
Slovakia [g]	included in RA	CS; IPCC					3,388				2,756					108	114,900	6.39	
Spain							14,819				4,236						360,400		
Sweden	CS	CS				5,443	5,172	-4.98		3,186	3,156	-0.95	0.02			106	95,700	-9.47	1.8
Switzerland	C	C				760	1,000	31.58	0.10							27	32,100	18.89	1.6
United Kingdom	T1	CS	L	0.6		3,779	11,681	209.10	0.01	12,746	12,746	0.00	-0.01			258	258,400	0.00	1.6
United States [h]	D	D,CS	L	NE	NA	IE	98,600			50,100	48,200	-3.79	1.60			3,713	3,713,000	0.00	1.5

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category "2.C Metal production".

[b] CO_2 emission estimates from Sinter (2.C.1.3) were not reported by any Party, CO_2 emission estimates from coke (2.C.1.4) were reported by only Canada and the United Kingdom.

[c] Source of crude steel production data: 1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[d] Pig iron production from: 1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[e] Source of primary aluminium production data: 1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[f] Source of default emission factors: IPCC Guidelines, Volume 3, pages 2.28 and 2.33.

[g] Activity data for aluminium production was reported in the sectoral background data tables for PFCs but not for CO_2 as the Party reported that these emissions were included elsewhere (energy), therefore the value for the activity data given here has been taken from the sectoral background data table for PFCs.

[h] Although emissions associated with iron and steel were included in the energy sector, they are still considered a key source here. However, it is not possible to calculate the percent of the key source.

Industrial processes - metal production

Iron and steel production

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		NA	NA	NA	NA	NA	NA	NA	NA	NA
Belgium									1,500	1,501
Canada		7,585								8,316
New Zealand		1,328	1,452	1,564	1,589	1,454	1,535	1,502	1,351	1,450
United Kingdom		2,760	1,794	1,781	1,880	4,755	4,924	5,539	4,557	4,409
United States		87,600	70,560	75,840	77,120	79,040	81,440	79,040	79,360	80,160

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia									
Belgium								0.1	
Canada									9.6
New Zealand	9.3	7.8	1.6	-8.5	5.6	-2.2	-10.1	7.4	9.2
United Kingdom	-35.0	-0.7	5.6	153.0	3.6	12.5	-17.7	-3.3	59.7
United States	-19.5	7.5	1.7	2.5	3.0	-2.9	0.4	1.0	-8.5

Trends in CO_2 implied emission factors , 1990-1998 (t/t)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		0	0	0	0	NA	0	0	0	0
Belgium										
Canada										
New Zealand		1.94	1.93	2.07	1.89	1.81	1.82	1.88	1.85	1.96
United Kingdom										
United States										

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia									
Belgium									
Canada									
New Zealand	-0.52	7.25	-8.70	-4.23	0.55	3.30	-1.60	5.95	1.03
United Kingdom									
United States									

Note:
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Austria, Bulgaria, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Aluminium production

Trends in CO_2 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		1,827	1,827	1,822	1,922	2,039	1,895	1,963	2,060	2,353
Canada		2,636								3,817
New Zealand		458	455	423	467	468	470	493	504	541
United Kingdom		450	456	380	371	359	369	372	384	401
United States		5,951	6,058	5,942	5,432	4,850	4,961	5,258	5,296	5,458

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.0	-0.3	5.5	6.1	-7.1	3.6	4.9	14.2	28.8
Canada									44.8
New Zealand	-0.6	-7.0	10.2	0.2	0.5	4.9	2.2	7.4	18.1
United Kingdom	1.3	-16.7	-2.3	-3.3	2.9	0.9	3.2	4.3	-11.0
United States	1.8	-1.9	-8.6	-10.7	2.3	6.0	0.7	3.1	-8.3

Trends in CO_2 implied emission factors 1990 to 1998 (t/t)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		1.48	1.48	1.48	1.48	1.48	1.47	1.47	1.48	1.48
Canada		1.68								1.63
New Zealand		1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.62	1.7
United Kingdom		1.55	1.55	1.56	1.55	1.55	1.55	1.55	1.55	1.55
United States		1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.0	0.0	0.0	0.0	-0.7	0.0	0.7	0.0	0.0
Canada									-3.0
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	-6.4	4.9	-1.7
United Kingdom	0.0	0.6	-0.6	0.0	0.0	0.0	0.0	0.0	0.0
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note:
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Austria, Belgium, Bulgaria, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland.

Industrial processes - PFC and SF_6 emissions from Metal production (1998)

	2.C Metal production (PFCs and SF_6)																	
	2.C. Metal production - PFCs										2.C. Metal production - SF_6							
	Methods and EF used[h]		2.C.3 Aluminium production - PFCs								Methods and EF used[i]		2.C.4.2 SF_6 Used in Magnesium Foundries					
	Methods	EF	Key source	Percent of national total	Activity data (Aluminium production)			IEF		Ratio[d]	Methods	EF	Key source	percent of national total	Activity data		SF_6-IEF	Actual emission SF_6[j]
					CRF[a]	UN[b]	Difference	CF_4	C_2F_6	IEF CF_4 / IEF C_2F_6					Description	Value		
				%	t	t	%	kg / t	kg / t					%		t	kg/t	t
IPCC default[c]								0.02 - 1.19	0.001 - 0.14								1000[g]	
Australia	T1c	CS			1,589,000	1,617,600	1.8	0.120	0.012	10.0	T2	CS			(SF6 consumption)	0.15	1000	0.15
Austria	-	-				0					-	-			Production	3000	1.67	5
Belgium																		NO
Bulgaria[f]	D	D			6,685			1.400	0.140	10.0	NE	NE						NE
Canada			L	0.9	2,339,325	2,374,100	1.5	0.354	0.030	11.8					Point Source SF6 Data from Magnesium Foundries	NA		64.28
Czech Republic					NO													NO
Finland					NO						D	NA			SF6 consumption	C		C
Greece					C	146,400		C	C	10.0					NE	NE		NE
Hungary	T1b	D			92,192	92,200	0.0	0.853	0.085	10.0	D	D						
Ireland	NA	NA			NO						NA	NA			NO	NO		NO
Italy					201,000	187,000				10.0								
Japan	-	-			NE	51,400		NE	NE		-	-			NE	NE		NE
Latvia																		
Lithuania																		
Netherlands	CS	PS				263,700					NO							
New Zealand	CS	PS			317,600	317,500	0.0	0.026	0.003	10.0	T1	PS			SF6 consumption	0.12	1000	0.12
Norway	T3	CS	L	2.3	991,282	995,500	0.4	0.186	0.007	26.1	T2	CS	L	1.0		51774	0.46	
Slovakia					108,000	114,900	6.4	0.028	0.003	10.0								
Spain						360,400				11.2								
Sweden	T1a, T1c	PS			105,709	95,700	-9.5	0.381	0.042	9.0								
Switzerland	T1c	M			27,000	32,100				10.6	T1c	M						0.1
United Kingdom	T2/PS	CS			258,397	258,400	0.0	0.128			T2/PS	CS			SF6 consumption	30	1000	30
United States[e]	CS	PS			3,713,000	3,713,000	0.0	0.381	0.033	11.4	CS	CS			Magnesium production and casting	131290	3.5	460

Note:

IEF for SF_6 used in aluminium foundries has not been reported by any Party. This category has therefore not been included in this table.

[a] This column includes aluminium production data provided for CF_4 and C_2F_6 in tables 2 (II). C, E of the CRF, complemented by that provided for CO_2 (Italy and Switzerland). Czech Republic reported NO in Summary table 3.

[b] Primary aluminium production from: 1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[c] Source of default emission factors: IPCC Guidelines, Vol. 3, page 2.35.

[d] For Greece, Italy, Spain and Switzerland, ratio of emissions is given.

[e] The production data for aluminium provided by the United States for CF_4 was by a factor of 1000 lower than that provided for CO_2, due to different units in the CRF. This has been corrected here.

[f] Bulgaria used CF_4 emissions as activity data for C_2F_4 emissions. The IEF displayed here refers to activity data to be comparable with other countries.

[g] IPCC guidelines state that emissions equal consumption (IPCC Guidelines, Volume 3, page 2.39).

[h] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for PFCs for all subcategories within the category "2.C. Metal production".

[i] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method used or type of emission factor for SF_6 for all subcategories within the category "2.C. Metal production".

[j] Additional information from Summary table 3 is included here for Bulgaria and the Czech Republic.

Industrial processes - metal production

Aluminum Production:

Trends in actual CF_4 emissions, 1990 to 1998 (tonnes and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		655.0	655.0	481.0	429.0	276.0	193.0	173.0	153.0	190.7
Canada		813.9								827.7
New Zealand		80.1	86.4	84.6	30.3	30.6	24.3	24.3	27.8	8.3
Spain		114.3	108.5	107.7	108.9	107.4	108.0	103.0	105.7	99.7
United Kingdom		300.0	230.0	110.0	70.0	60.0	55.0	44.0	35.0	33.0
United States		2,668.9	2,321.8	2,184.6	1,881.5	1,574.8	1,572.6	1,602.6	1,490.3	1,415.7

Relative change to previous year

	1991	1992	1993	1994	1995	1996	1997	1998	Change from 1990 to 1998
Australia	0.0	-26.6	-10.8	-35.7	-30.1	-10.4	-11.6	24.6	-70.9
Canada									1.7
New Zealand	7.9	-2.1	-64.1	0.9	-20.6	0.0	14.4	-70.0	-89.6
Spain	-5.1	-0.7	1.1	-1.3	0.6	-4.6	2.6	-5.7	-12.8
United Kingdom	-23.3	-52.2	-36.4	-14.3	-8.3	-20.0	-20.5	-5.7	-89.0
United States	-13.0	-5.9	-13.9	-16.3	-0.1	1.9	-7.0	-5.0	-47.0

Note:
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Austria, Bulgaria, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Norway, Sweden, Slovakia and Switzerland.
In the case of Belgium and the Netherlands, data was only reported for 1997 and 1996, respectively.

Consistency check

The following check has been performed in order to verify the consistency of the data provided in various CRF tables (1998):
Note that only Parties that provided numerical information and for which differences in the data or any other inconsistencies were found were included in the table below.

Activity data reported in different tables of the CRF:

	Aluminum production		
	for CO_2	**for CF_4**	**for C_2F_6**
CRF table:	**2(I)A-G**	**2(II)C,E**	**2(II)C,E**
	kt	**t**	**t**
Bulgaria	7	6,685	9
Italy	201		
Norway	965	991,282	991,282
Slovakia		108,000	108,000
Switzerland	27		
United Kingdom	258	258,397	IE
United States of A	3,713	3,713	3,713

Note: Bulgaria reported CF_4 emissions as activity data for C_2F_6 emissions.

Industrial processes - Production of Halocarbons and SF_6 (1998)

	2.E Production of Halocarbons and SF_6										
	2.E Production of Halocarbons and SF_6 - HFCs							2.E Production Halocarbons and SF_6 - PFCs		2.E Production Halocarbons and SF_6 - SF_6	
	Methods and EF used[d]		2.E.1 By-product emissions, production of HCFC-22					Methods and EF used		Methods and EF used	
	Methods	EF	Key source	Percent of national total	Activity data (HCFC-22 production)		IEF	Method	EF	Method	EF
					CRF	International[a]	CF_4				
				%	t	t	kg / t				
IPCC default[b]							40				
Australia	NA	NA			NO			NA	NA	NA	NA
Austria	-	-						-	-	-	-
Belgium											
Bulgaria	NE	NE			NO			NE	NE	NE	NE
Canada	NA	NA			NO	x		NA	NA	NA	NA
Czech Republic	NO							NO		NO	
Finland					NO						
Greece	T1	D	L	3.0	C	x		CS	CS		
Hungary [e]	NO							NO		NO	
Ireland	NA	NA			NE			NA	NA	NA	NA
Italy						x					
Japan	-	-			NE	x	NE	-	-	-	-
Latvia											
Lithuania											
Netherlands	CS	PS				x		NO		NO	
New Zealand					NA						
Norway	-	-									
Slovakia[e]	NO							NO		NO	
Spain			L	2.1		x					
Sweden	T1a							T1a		T1a	
Switzerland								T1c	M	T1c	M
United Kingdom[c]	T2/PS	CS	L	2.4	IE	x		T2/PS	CS	NO	NO
United States	M	M			C	x		M	M	CS	CS

[a] An 'X' in this column indicates whether an estimate of aggregated production of HCFCs for 1998 is available from the Secretariat of the Montreal Protocol. Usually HFC-23 occurs only during the production of HCFC-22.

[b] Source of default emission factors: IPCC Guidelines, Vol. 3, page 2.35.

[c] The United Kingdom reported aggregated HFC emissions from 2.E.1 production and 2.E.2 Fugitive. Under that category, UK reports for 1998 activity data 38,830t and implied emission factor 36.79.

[d] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for HFCs for all subcategories within the category "2.E. Production of Halocarbons and SF6".

[e] Hungary and Slovakia reported NO in table 7 of the CRF.

Industrial processes - By-product emissions

Production of HCFC-22:
Trends in HFC-23 emissions, 1990 to 1998 (tonnes and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Spain		247.3	220.0	245.2	193.0	332.0	477.6	524.2	635.0	635.0
United Kingdom[a]		972.3	1,012.3	1,052.4	1,092.9	1,137.0	1,200.4	1,231.4	1,350.0	1,428.6
United States		2,977.2	2,632.5	2,977.2	2,726.5	2,695.2	2,319.1	2,663.8	2,569.8	3,416.0

Relative Change to Previous Year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Change from 1990 to 1998
Spain	-11.0	11.5	-21.3	72.0	43.9	9.8	21.1	0.0	156.8
United Kingdom[a]	4.1	4.0	3.8	4.0	5.6	2.6	9.6	5.8	46.9
United States	-11.6	13.1	-8.4	-1.1	-14.0	14.9	-3.5	32.9	14.7

Note
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Australia, Austria, Belgium, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, New Zealand, Norway, Slovakia, Sweden and Switzerland.
The Netherlands reported data for 1996 only.

[a] Emissions for the United Kingdom are all aggregated HFCs from 2.E.1 by-production and 2.E.2 Fugitive emissions.

Industrial processes - HFC emissions from Consumption of Halocarbons and SF6 (1998)

	2.F. Consumption of Halocarbons and SF6 - HFCs																														
	Method and EF used[d]		Key source[a]	Percent of national total[b]	HFC-23			HFC-32			HFC-41			HFC-43-10mee			HFC-125			HFC-134			HFC-134a		
	Method	EF			P	A		P	A		P	A		P	A		P	A		P	A		P	A	
					2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A
	%				Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.		
Australia	NE	NA			NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE	
Austria	CS	CS	L	1.0				4.88									206.85	11.73	17.64				2,202.25	750.97	2.93
Belgium											NO			NO			139.69	24.19	5.77	NO			1,014.00	456.44	2.22
Bulgaria	T1a	D			349.60												45.89						70.31		
Canada	T2	D			29.27	31.61	0.93	0.10	0.02	4.11							20.79	147.62	0.14				923.93	527.30	1.75
Czech Republic	D																								
Finland	T1a, T2, CS	D, CS			1.93	0.29	6.60	1.16	0.41	2.86							151.17	50.70	2.98				330.50	119.10	2.77
Greece																									
Hungary	T1a, D	CS															30.80	12.94	2.38				277.21	120.59	2.30
Ireland	NA	NA			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Italy						5.30			15.51									174.57						1,080.68	
Japan[e]	-	-	L	2.4	18,099.90	NE	NE	121.55	NE	NE	C, IE, NE	NE	NE	C, IE, NE	NE	NE	492.80	NE	NE	C, IE, NE	NE	NE	12,499.50	NE	NE
Latvia																									
Lithuania																									
Netherlands[c]	CS	CS	L	2.8																					
New Zealand	T1a				NA	NA		NE	NE		NA	NA		NA	NA		67.40	NE		NA	NA		214.92	NE	
Norway	T2	CS			1.17	0.78	1.50	1.07	0.22	4.98							175.19	41.25	4.25				337.47	49.66	6.80
Slovakia	IPCC	IPCC; CS				0.54		0.04	0.04	1.00							8.34	1.22	6.87				94.47	37.93	2.49
Spain						122.85												31.44						605.66	
Sweden[f]			L	1.9	0.00			14.49									240.24						915.46		
Switzerland	T2	M			15.21	1.17	13.00	6.44	0.33	19.80					104.78		161.56	31.92	5.06				622.18	289.64	2.15
United Kingdom	T2	D/CS			5,784.18	3,649.91	1.58		IE			IE			IE			IE			IE			IE	
United States	M	M				9,415.40									1,956.92			2,875.66						36,000.43	

	HFCs																								
	HFC-152A			HFC-143			HFC-143a			HFC-227ea			HFC-236fa			HFC-245ca			Total		
	P	A		P	A		P	A		P	A		P	A		P	A		P	A	
	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A	2.F.(p)	2.F.(a)	Ratio P/A
	Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.		
Australia	NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE	
Austria							257.87	16.08	16.04										2,671.85	778.77	3.43
Belgium	0.51	2.92	0.18	NO			268.65	43.17	6.22				NO			NO			1,422.85	526.72	2.70
Bulgaria	0.06						110.81												576.65		
Canada	6.67	5.73	1.16				12.66	141.08	0.09	29.72	10.69	2.78							1,023.13	864.07	1.18
Czech Republic																			362.69		
Finland	10.34	4.29	2.41				210.67	71.67	2.94										705.77	246.45	2.86
Greece																					
Hungary							49.40	20.75	2.38										357.41	154.27	2.32
Ireland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Italy								160.84												1,436.90	
Japan	1.68	NE	NE	C, IE, NE	NE	NE	338.20	NE	NE	C, IE, NE	NE	NE	C, IE, NE	NE	NE	C, IE, NE	NE	NE	31,553.63	NE	NE
Latvia																					
Lithuania																					
Netherlands																					
New Zealand	0.14	NE		NA	NA		90.55	NE		NA	NA		NA	NA		NA	NA		373.01	NE	
Norway	6.97	0.67	10.40				165.64	39.64	4.18	1.69	0.43	3.95							689.20	132.64	5.20
Slovakia	0.31	0.05	6.89				10.26	1.75	5.86	5.92	2.06	2.87							119.34	43.58	2.74
Spain								51.79			21.75									833.49	
Sweden	0.43						214.70												1,385.33		
Switzerland	9.48	9.00	1.05				189.24	31.54	6.00										1,004.10	468.38	2.14
United Kingdom		IE			IE			IE			IE			IE			IE		5,784.18	3,649.91	1.58
United States								1,923.71						933.04						53,105.16	

[a] Due to the rapid increase in the use of HFCs, it is likely that this source is a key source for many countries, if the trend assessment is taken into account. The trend assessment has not been performed for this first synthesis and assessment report.

[b] The ratio refers to the actual emissions, if available, otherwise to potential emissions. This is the case for Japan and Sweden.

[c] The Netherlands reported aggregated emissions of all HFCs for the industrial process sector. These aggregated emissions are a key source.

[d] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all HFCs for all sub categories within the category "2.F. Consumption of Halocarbons and SF6".

[e] This source is a key source for Japan, since only potential emissions were reported.

[f] This source is a key source for Sweden, since only potential emissions were reported.

Industrial processes - PFC and SF_6 emissions from Consumption of Halocarbons and SF_6 (1998)

	2.F. Consumption of Halocarbons and SF6 - PFCs																																		
	Method and EF used[c]		Key-source[a]	Percent of national total[b]	CF_4			C_2F_6			C_3F_8			C_4F_{10}			c-C_4F_8			C_5F_{12}			C_6F_{14}			Total									
	Method	EF			P	A	Ratio P/A	P	A	Ratio P/A	P	A	Ratio P/A	P	A	Ratio P/A	P	A	Ratio P/A	P	A	Ratio P/A	P	A	Ratio P/A	P	A	Ratio P/A						
					2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)		2.F.(p)	2.F.(a)								
				%	Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.			Gg CO_2 equ.									
Australia	NE	NA			NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE		NE	NE								
Austria	CS	CS			8.91	5.85	1.52	17.20	14.72	1.17																26.11	20.57	1.27							
Belgium					NO									NO			NO			NO			NO												
Bulgaria	NE	NE																																	
Canada	T2	PS																																	
Czech Republic	D																									102.79									
Finland	T1a, CS	NA			0.16	0.16	1.00																	0.74	0.74	1.00	0.90	0.90	1.00						
Greece																																			
Hungary	T1a	CS																						26.64	13.32	2.00	26.64	13.32	2.00						
Ireland	NA	NA			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE						
Italy																																			
Japan[d]	-	-	L	1.3	1,287.00	NE	NE	5,492.40	NE	NE	364.00	NE	NE	C, IE, NE	NE	NE	52.20	NE	NE	10,590.00	NE	NE	IE	NE	NE	17,785.60	NE	NE							
Latvia																																			
Lithuania																																			
Netherlands[e]	CS	CS	L	0.9																															
New Zealand	T1a				NA	NA		NA	NA		140.00	NA			NA			NA			NA			NA		140.00	NA							
Norway											7.00	0.39	18.10													7.00	0.39	18.10						
Slovakia	IPCC	IPCC; CS			2.81	1.55	1.81																			2.81	1.55	1.81						
Spain												10.50															10.50							
Sweden					5.20			13.80			4.20															23.20								
Switzerland	T2	M			3.25	0.65	5.00	16.56	4.60	3.60				7.00			3.48	0.87	4.00	12.00	0.75	16.00	2.22	0.74	3.00	44.51	7.61	5.85						
United Kingdom	T2	D/CS			1,670.52	428.33	3.90		IE			IE			IE			IE			IE			IE		1,670.52	428.33	3.90						
United States	M	M							7,700.00																		7,700.00							

[a] Due to the rapid increase in the use of PFCs, it is likely that this source is a key source for many countries, if the trend assessment is taken into account. The trend assessment has not been performed for this first synthesis and assessment report.

[b] The ratio refers to the actual emissions, if available, otherwise to potential emissions. This is the case for Japan.

[c] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all PFCs for all subcategories within the category "2.F. Consumption of Halocarbons and SF6".

[d] This source is a key source for Japan, since only potential emissions were reported.

[e] The Netherlands reported aggregated emissions of all PFCs for the industrial process sector. These aggregated emissions are a key source.

	2.F. Consumption of Halocarbons and SF_6 - SF_6						
	Method and EF used[c]		Key-source[a]	Percent of total[b]	P	A	Ratio P/A
	Method	EF			2.F.(p)	2.F.(a)	
				%	Gg CO_2 equ.		
Australia	NE	NA			NE	NE	
Austria	CS	CS	L	1.1	11,139.79	847.73	13.14
Belgium					478.00	206.29	2.32
Bulgaria	NE	NE					
Canada	T3	PS			1,536.21		
Czech Republic	D				57.91		
Finland	T1a, T2	CS, D			96.56	29.57	3.27
Greece							
Hungary	D	CS			177.34	101.10	1.75
Ireland	NA	NA			NE	NE	NE
Italy						349.76	
Japan[d]	-	-	L	3.7	49,998.80	NE	NE
Latvia							
Lithuania	T1	T1					
Netherlands[e]	CS						
New Zealand					62.96	28.97	2.17
Norway					1,024.57	124.26	8.25
Slovakia	IPCC	IPCC; CS				12.24	
Spain						182.84	
Sweden[f]			L	2.9	2,143.83		
Switzerland	T2	M			1,056.38	138.62	7.62
United Kingdom	T2	CS			2,856.05	572.33	4.99
United States	CS	CS				25,668.60	

[a] Due to the rapid increase in the use of SF_6, it is likely that this source is a key source for all countries, if the trend assessment is taken into account. The trend assessment has not been performed for this first synthesis and assessment report.

[b] The ratio refers to the actual emissions, if available, otherwise to potential emissions. This is the case for Japan and Sweden.

[c] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for SF_6 for all sub categories within the category "2.F. Consumption of Halocarbons and SF_6".

[d] This source is a key source for Japan, since only potential emissions were reported.

[e] The Netherlands reported aggregated emissions of all PFCs for the industrial process sector.

[f] This source is a key source for Sweden, since only potential emissions were reported.

Industrial processes - Consumption of Halocarbons and SF_6 (HFCs)

Trends in actual HFC-134a emissions, 1990 to 1998 (tonnes and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Belgium							248.3	295.9	351.1	351.1
Spain							1.6	167.7	338.3	465.9
United States		564.1	564.1	626.5	2,884.7	6,407.7	14,596.2	19,350.3	24,065.4	27,692.6

Relative change to previous Year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Change from 1990 to 1998
Belgium						19.2	18.7	0.0	
Spain						10253.7	101.7	37.7	
United States	0.0	11.1	360.5	122.1	127.8	32.6	24.4	15.1	4809.2

Note:
The trend in HFC-134a emissions is presented here, since HFC-134a is the most commonly used HFC.
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Australia, Austria, Bulgaria, Canada, Czech Republic, Finland, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, New Zealand, Norway, Slovakia, Sweden, Switzerland and the United Kingdom.
In the case of the Netherlands, data was only reported for 1996.

Industrial processes - Consumption of Halocarbons and SF_6 (SF_6)

Trends in actual SF_6 emissions, 1990 to 1998 (tonnes and annual percentage change)

	base year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Belgium							8.6	8.6	8.6	8.6
Finland		2.3								1.2
New Zealand		NE	NE	NE	NE	1.0	0.7	1.0	1.1	1.2
Spain		4.4	4.5	4.6	4.7	5.1	6.0	6.4	7.1	7.7
United Kingdom		10.3	12.5	14.8	17.2	19.4	22.4	23.2	22.8	24.0
United States		859.1	902.1	945.1	988.0	1,031.0	1,073.9	1,073.9	1,073.9	1,074.0

Relative change to previous Year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Change from 1990 to 1998
Belgium						0.0	0.0	0.0	
Finland									-45.1
New Zealand					-33.0	55.2	4.8	11.0	
Spain	2.5	2.9	1.7	8.1	19.6	6.1	10.1	8.4	75.9
United Kingdom	21.2	18.9	15.9	12.8	15.6	3.3	-1.4	4.9	132.5
United States	5.0	4.8	4.5	4.3	4.2	0.0	0.0	0.0	25.0

Note:
The following Parties are not included in this table because numerical information for years other than 1998 was not reported:
Australia, Austria, Bulgaria, Canada, Czech Republic, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Norway, Slovakia, Sweden and Switzerland.
In the case of the Netherlands data was only reported for 1996.

Industrial processes: Activity data from international sources

Aluminium production 1998 in thousands of metric tons

Source	Monthly Bulletin of Statistics			ICS 1998[a]	
	Type	Monthly average	in 1998	Primary	Total
Australia	A	134.8	1617.6	1617.6	1721.6
Austria	B	7.8	93.6	0	126.4
Belgium					0
Bulgaria					
Canada	A	197.8	2373.6	2374.1	2485.1
Czech Republic					
Finland					
Greece	A	12.2	146.4	146.4	146.4
Hungary	A	2.8	33.6	92.2	92.2
Ireland					
Italy	A	15.5	186	187	689.6
Japan	A	25.8	309.6	51.4	1206.8
Latvia					
Lithuania					
Netherlands	A+B	34.4	412.8	263.7	365.7
New Zealand	A	26.5	318	317.5	325.5
Norway	A+B	88.2	1058.4	995.5	1057.9
Slovakia				114.9	120.7
Spain	A	29.9	358.8	360.4	570.4
Sweden				95.7	122.7
Switzerland				32.1	47.2
United Kingdom	A	21.5	258	258.4	533.2
United States	A	309.4	3712.8	3713	7153
	Type A: primary (virgin) aluminium from domestic and imported ores.			unwrought primary	unwrought total
	Type B: secondary, I.e. derived from scrap.				

Monthly Bulletin of Statistics, United Nations Statistics Division, Vol. LIV, No. 12, December 2000, ST/ESA/STAT/SER.Q/336.
1998 Industrial Commodity Statistics Yearbook, Production statistics 1989-1998, Department of Economic and Social Affairs, Statistics Division, United Nations, New York 2000.

[a] For a comparison of aluminium production data as reported in the CRF by Parties please refer to table "industrial processes - PFC and SF6 emissions from Metal production (1998)".

Total HFC-134a Sales by Region (metric tons)

	Northern Hemisphere		Southern Hemisphere	
Year	30-90 Degrees North	0-30 Degrees North	0-90 Degrees South	TOTAL
	(plus fugitive emissions)			
1990	189	-----	-----	189
1991	2,197	1	-----	2,198
1992	6,343	47	14	6,404
1993	25,955	287	284	26,526
1994	46,726	2,507	1,167	50,400
1995	67,020	4,744	2,005	73,769
1996	75,148	5,876	2,650	83,674
1997	92,257	5,668	4,012	101,937
1998	98,174	8,351	5,710	112,235
1999	117,784	9,578	6,300	133,662
TOTAL	531,793	37,059	22,142	590,994

Source: AFEAS (www.afeas.org)

Annual Global Fluorocarbon Production (metric tons)

	HFC-134a
1990	189
1991	2,198
1992	6,404
1993	26,526
1994	50,400
1995	73,769
1996	83,674
1997	101,937
1998	112,235
1999	133,662

Source: AFEAS (www.afeas.org)

3. Agriculture

Agriculture - enteric fermentation, CH_4 (1998)

	4.A Enteric fermentation (CH_4)																
	Methods and EF used[a]		Key source	Per cent of national total	4.A.1 Cattle					4.A.3 Sheep				4.A.8 Swine			
					Activity data (population size)			Dairy cattle	Non-dairy cattle	Activity data (population size)			CH_4 IEF	Activity data (population size)			CH_4 IEF
	Methods	EF			CRF	FAO[b]	Difference	CH_4 IEF		CRF	FAO[b]	Difference	kg CH_4/ head/yr	CRF	FAO[b]	Difference	kg CH_4/ head/yr
				%	(1000 heads)		%	kg CH_4/head/yr		(1000 heads)		%		(1000 heads)		%	
IPCC default EF[c]								*56 - 118[d]*	*44 - 56[d]*				*8*				*1.5*
Australia	CS	CS	L	12.6	26,815	26,710	-0.4	107.1	74.2	118,860	117,494	-1.1	6.6	2,662	2,768	4.0	1.1
Austria	C	CS	L	3.4	2,172	2,198	1.2	92.0	38.0	361	384	6.3	8.0	2,843	3,680	29.4	1.5
Belgium			L	3.0	0	3,184					155				7,436		
Bulgaria	T1	D	L	2.0	642	612	-4.6	81.0	56.0	2,811	2,848	1.3	8.0	1,601	1,480	-7.5	1.5
Canada	T1	D	L	2.6	13,715	13,272	-3.2	99.3	54.3	443	613	38.5	13.2	12,163	11,985	-1.5	1.5
Czech Republic	T2	CS	L	1.2	1,690	1,701	0.7	68.2	23.6	94	94	-0.5	5.0	3,995	4,013	0.5	3.4
Finland	T2	CS/D	L	2.0	1,117	1,101	-1.5	100.5	38.7	128	128	0.0	8.0	1,401	1,541	10.0	1.5
Greece	T1	D	L	2.4	600	596	-0.6	81.0	59.7	9,195	8,952	-2.6	7.9	1,424	938	-34.1	1.5
Hungary [(e)]	D	D	L	2.0	873	871	-0.2				858			5,479	4,931	-10.0	
Ireland	D	CS, D	L	16.3	7,385	6,992	-5.3	100.0	50.0	6,954	5,634	-19.0	8.0	1,759	1,717	-2.4	1.5
Italy			L	2.4	0	7,166					10,894				8,281		
Japan	D	CS			4,651	4,708	1.2	90.0	53.9	16	16	0.0	4.1	9,863	9,904	0.4	1.1
Latvia			L	5.8	434	434	0.1	81.0	56.0	29	29	1.3	8.0	421	421	0.0	1.5
Lithuania	RA	D	L	6.4	928	1,016	9.6	81.0	56.0	16	24	50.9	8.0	1,168	1,200	2.7	1.5
Netherlands	CS	CS	L	3.0	4,284	4,292	0.2	80.9	48.5	1,394	1,465	5.1	8.0	13,446	11,438	-14.9	1.5
New Zealand	T1	CS	L	39.0	8,919	8,873	-0.5	76.8	67.5	46,136	45,956	-0.4	15.1	396	351	-11.4	NE
Norway	T1	D	L	3.5	1,031	1,036	0.5	100.0	48.0	2,717	2,399	-11.7	8.0	641	689	7.6	1.5
Slovakia	IPCC; CS	IPCC; CS	L	2.2	705	803	14.0	92.0	56.0	326	417	27.9	8.0	1,593	1,810	13.6	1.5
Spain			L	3.5		5,884					24,857				21,562		
Sweden	T1, T2	CS	L	4.1	1,739	1,739	0.0	154.0	49.2	421	421	0.0	6.8	2,286	2,286	0.0	1.7
Switzerland	CS	CS	L	4.6	1,641	1,641	0.0	99.2	43.0	422	420	-0.5	6.9	1,487	1,487	0.0	1.0
United Kingdom	T2	D/CS	L	2.7	11,519	11,519	0.0	92.9	44.3	44,471	44,471	0.0	4.7	8,147	8,146	0.0	1.5
United States	M	M	L	1.8	97,773	99,744	2.0	156.9	47.0	7,817	7,825	0.1	8.0	62,043	61,158	-1.4	1.5

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for the various livestock types within the category CH_4 from "4.A enteric fermentation".

[b] Source of international statistics: FAO, http://apps.fao.org/page/collections?subset=agriculture.

[c] Source of default emission factors: IPCC Guidelines, Volume 3, Tables 4-3 and 4-4 (pages 4.10 - 4.11).

[d] For dairy and non-dairy cattle default emission factors (in kg CH_4 / head/ yr) are provided by regions as shown below (see footnote c for source reference):

	North America	Western Europe	Eastern Europe	Oceania	Asia
Dairy cattle	118	100	81	68	56
Non-dairy cattle	47	48	56	53	44

[e] Hungary: Activity data (population size) presented in this table are as reported in CRF table 4B(b) as CRF tables 4A and 4B(a) were not provided by the Party.

Agriculture - enteric fermentation

Trends in CH_4 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		3,065	3,072	3,021	2,962	2,902	2,876	2,865	2,881	2,887
Austria		154	151	144	142	141	135	133	131	131
Belgium									205	206
Bulgaria	193	180	165	135	104	87	82			82
Canada		762	769	760	795	834	861	867	875	855
Finland		83	79	77	77	76	72	72	73	71
Greece		140	138	137	137	137	138	140	142	143
Hungary	157	126	122	105	90	85	84	82	79	81
Ireland		453	457	458	460	462	468	477	488	494
Italy		646	656	628	615	624	637	629	628	628
Japan		345	350	351	348	344	339	335	331	328
Netherlands		505	517	505	497	483	476	365	353	341
New Zealand		1,474	1,441	1,418	1,416	1,422	1,420	1,406	1,394	1,389
Norway		86	87	89	88	91	92	92	92	94
Slovakia		116	101	87	74	69	71	68	62	55
Spain		589	577	580	591	578	575	620	620	620
Sweden		147	188	179	179	184	179	146	147	143
Switzerland		130	132	131	130	127	128	126	124	120
United Kingdom		913	900	900	900	907	898	905	893	883
United States		5,712	5,732	5,804	5,876	6,016	6,094	6,032	5,973	5,885

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.2	-1.7	-1.9	-2.0	-0.9	-0.4	0.5	0.2	-5.8
Austria	-2.1	-4.6	-1.8	-0.8	-3.8	-1.8	-1.1	-0.4	-15.4
Belgium								0.0	
Bulgaria	-8.4	-17.9	-23.0	-16.3	-5.5	-100.0			-61.8
Canada	1.0	-1.2	4.7	4.8	3.3	0.7	1.0	-2.2	12.3
Finland	-4.9	-2.6	-0.4	-0.4	-5.4	-0.1	1.0	-2.3	-14.3
Greece	-1.3	-0.7	-0.2	0.4	0.4	1.2	1.4	0.9	2.2
Hungary	-2.7	-14.0	-13.9	-5.8	-2.0	-2.0	-3.7	2.8	-60.1
Ireland	0.9	0.1	0.5	0.5	1.2	2.1	2.2	1.2	9.0
Italy	1.6	-4.3	-1.9	1.4	2.1	-1.2	-0.1	0.0	-2.8
Japan	1.2	0.3	-0.7	-1.2	-1.4	-1.2	-1.1	-1.1	-5.1
Netherlands	2.4	-2.3	-1.6	-2.8	-1.5	-23.2	-3.5	-3.2	-32.4
New Zealand	-2.3	-1.6	-0.1	0.4	-0.1	-1.0	-0.9	-0.4	-5.8
Norway	1.4	1.9	-1.3	3.7	1.1	0.3	0.3	1.5	9.2
Slovakia	-13.3	-13.9	-14.8	-6.4	2.3	-4.2	-8.1	-12.0	-52.8
Spain	-2.1	0.4	2.0	-2.2	-0.5	7.8	0.0	0.0	5.2
Sweden	27.9	-4.8	0.0	2.6	-2.4	-18.3	0.2	-2.4	-2.5
Switzerland	1.1	-0.8	-0.6	-1.9	0.3	-1.3	-1.5	-3.0	-7.5
United Kingdom	-1.4	-0.1	0.0	0.8	-0.9	0.8	-1.4	-1.2	-3.4
United States	0.4	1.3	1.2	2.4	1.3	-1.0	-1.0	-1.5	3.0

Notes:

The Czech Republic, Latvia and Lithuania are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987). For these Parties, the values in the column "percentage change from 1990 to 1998" refer to the base year data.

Agriculture - enteric fermentation: dairy and non-dairy cattle

Dairy cattle:

Trends in CH_4 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	263.5	261.5	262.1	271.3	280.8	292.0	302.1	315.4	322.9
Belgium[a]								198.2	199.3
Canada	196.4								173.1
Finland	46.2								38.5
Japan	182.5	182.7	181.2	177.6	174.1	171.4	169.4	166.6	163.3
Netherlands							262.2	252.1	247.8
New Zealand	262.6	266.1	272.7	285.9	301.7	314.7	323.2	330.2	334.1
United Kingdom	295.9	288.9	285.2	285.8	291.5	283.5	284.7	280.8	278.8
United States	1,473.9	1,464.9	1,472.5	1,468.1	1,470.9	1,473.1	1,454.1	1,453.2	1,443.1

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-0.8	0.2	3.5	3.5	4.0	3.5	4.4	2.4	22.6
Belgium[a]								0.5	
Canada									-11.9
Finland									-16.6
Japan	0.1	-0.8	-2.0	-2.0	-1.6	-1.2	-1.7	-2.0	-10.5
Netherlands							-3.8	-1.7	
New Zealand	1.3	2.5	4.8	5.5	4.3	2.7	2.2	1.2	27.2
United Kingdom	-2.4	-1.3	0.2	2.0	-2.7	0.4	-1.4	-0.7	-5.8
United States	-0.6	0.5	-0.3	0.2	0.2	-1.3	-0.1	-0.7	-2.1

[a] Belgium reported CH_4 emissions from cattle without differentiating between dairy and non-dairy cattle. These data are included in this table.

Trends in CH_4 implied emission factors, 1990 to 1998 (kg/head/yr)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	102.7	103.4	104.5	105.6	106.0	106.5	106.5	107.0	107.1
Canada	98.7								99.3
Finland	94.3								100.5
Japan	88.2	88.2	88.1	88.3	88.6	89.0	89.4	89.7	90.0
Netherlands							80.0	80.0	80.9
New Zealand	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8
United Kingdom	87.6	87.4	88.3	88.3	89.1	89.5	89.1	91.3	92.9
United States	147.3	148.2	151.6	151.7	154.8	155.2	154.5	156.1	156.9

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.7	1.0	1.1	0.4	0.5	0.1	0.5	0.0	4.3
Canada									0.6
Finland									6.6
Japan	0.0	0.0	0.1	0.4	0.5	0.4	0.3	0.4	2.1
Netherlands							0.0	1.1	
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
United Kingdom	-0.3	1.1	0.0	1.0	0.4	-0.4	2.4	1.8	6.0
United States	0.6	2.3	0.1	2.0	0.3	-0.4	1.0	0.5	6.5

Non-Dairy cattle:

Trends in CH_4 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	1,664.1	1,700.7	1,713.8	1,720.9	1,720.4	1,735.4	1,744.7	1,761.6	1,765.7
Canada	537.7								649.9
Finland	33.0								28.4
Japan	149.6	154.0	157.0	158.2	157.7	156.0	154.2	153.3	153.0
Netherlands							66.1	63.0	59.2
New Zealand	312.0	315.5	321.6	331.6	338.3	336.7	325.4	314.3	308.4
United Kingdom	396.1	391.3	393.1	391.0	393.4	394.2	403.7	392.0	377.2
United States	3,951.5	3,978.8	4,039.1	4,120.3	4,255.8	4,340.5	4,304.7	4,245.6	4,165.2

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	2.2	0.8	0.4	0.0	0.9	0.5	1.0	0.2	6.1
Canada									20.9
Finland									-14.0
Japan	3.0	1.9	0.8	-0.3	-1.1	-1.1	-0.6	-0.2	2.3
Netherlands							-4.6	-6.0	
New Zealand	1.1	1.9	3.1	2.0	-0.5	-3.3	-3.4	-1.9	-1.1
United Kingdom	-1.2	0.5	-0.5	0.6	0.2	2.4	-2.9	-3.8	-4.8
United States	0.7	1.5	2.0	3.3	2.0	-0.8	-1.4	-1.9	5.4

Trends in CH_4 implied emission factors, 1990 to 1998 (kg/head/yr)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	75.0	75.1	75.2	75.3	74.9	74.5	74.2	74.3	74.2
Canada	54.3								54.3
Finland	38.0								38.7
Japan	53.4	53.4	53.4	53.4	53.5	53.7	53.8	53.8	53.9
Netherlands							51.8	50.0	48.5
New Zealand	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5
United Kingdom	44.9	45.0	45.2	45.4	45.3	45.4	45.6	45.8	44.3
United States	47.4	47.5	47.7	47.7	47.6	47.5	47.5	47.1	47.0

Relative Change to Previous Year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.1	0.2	0.1	-0.5	-0.5	-0.4	0.1	-0.1	-1.1
Canada									-0.1
Finland									1.9
Japan	-0.1	0.0	0.0	0.3	0.2	0.2	0.1	0.2	1.0
Netherlands							-3.6	-3.0	
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
United Kingdom	0.1	0.5	0.4	-0.2	0.2	0.6	0.4	-3.3	-1.4
United States	0.3	0.3	0.1	-0.2	-0.3	0.1	-0.9	-0.2	-0.8

Note:

The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Belgium, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Slovakia, Spain, Sweden and Switzerland.

Agriculture - enteric fermentation: sheep and swine

Sheep

Trends in CH_4 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	1124.50	1097.36	1032.04	957.21	890.09	838.08	808.37	793.06	786.86
Belgium								0.81	0.81
Canada	5.71								5.71
Finland	0.83								1.03
Japan	0.12	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.07
Netherlands							13.00	11.72	11.15
New Zealand	853.57	814.42	781.08	757.30	740.54	727.04	714.13	702.00	696.66
United Kingdom	205.23	203.95	204.91	205.67	204.57	203.50	199.73	201.85	208.08
United States	90.87	89.39	86.38	81.61	78.60	71.86	67.66	64.12	62.53

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-2.4	-6.0	-7.3	-7.0	-5.8	-3.5	-1.9	-0.8	-30.0
Belgium									
Canada									0.0
Finland									24.1
Japan	0.0	-8.3	-9.1	-10.0	-11.1	-12.5	0.0	0.0	-41.7
Netherlands							-9.8	-4.9	
New Zealand	-4.6	-4.1	-3.0	-2.2	-1.8	-1.8	-1.7	-0.8	-18.4
United Kingdom	-0.6	0.5	0.4	-0.5	-0.5	-1.9	1.1	3.1	1.4
United States	-1.6	-3.4	-5.5	-3.7	-8.6	-5.8	-5.2	-2.5	-31.2

Trends in CH_4 implied emission factors, 1990 to 1998 (kg/head/yr)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	6.68	6.70	6.73	6.74	6.70	6.67	6.65	6.63	6.62
Belgium									
Canada	13.87								13.19
Finland	8.00								8.00
Japan	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
Netherlands							7.99	8.00	8.00
New Zealand	15.10	15.10	15.10	15.10	15.10	15.10	15.10	15.10	15.10
United Kingdom	4.62	4.62	4.60	4.63	4.37	4.70	4.75	4.71	4.68
United States	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.3	0.4	0.1	-0.6	-0.4	-0.3	-0.3	-0.2	-0.9
Belgium									
Canada									-4.9
Finland									0.0
Japan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands							0.1	0.0	
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
United Kingdom	0.0	-0.4	0.7	-5.6	7.6	1.1	-0.8	-0.6	1.3
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note

The following Parties are not included in these tables because data for years other than 1998 were not reported:
Austria, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Slovakia, Spain, Sweden and Switzerland.

Swine

Trends in CH_4 emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	2.94	2.90	2.89	2.96	2.96	2.91	2.83	2.87	2.92
Belgium								5.45	5.58
Canada	15.32								18.24
Finland	2.09								2.10
Japan	12.46	12.09	11.83	11.55	11.24	10.95	10.82	10.81	10.80
Netherlands							21.60	22.78	20.17
United Kingdom	11.32	11.54	11.56	11.78	11.84	11.44	11.38	12.11	12.22
United States	80.91	84.72	87.80	87.02	89.93	88.35	84.33	88.09	93.06

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-1.4	-0.3	2.4	0.0	-1.7	-2.7	1.4	1.7	-0.7
Belgium								2.4	
Canada									19.1
Finland									0.5
Japan	-3.0	-2.2	-2.4	-2.7	-2.6	-1.2	-0.1	-0.1	-13.3
Netherlands							5.5	-11.5	
United Kingdom	1.9	0.2	1.9	0.5	-3.4	-0.5	6.4	0.9	8.0
United States	4.7	3.6	-0.9	3.3	-1.8	-4.6	4.5	5.6	15.0

Trends in CH_4 implied emission factors, 1990 to 1998 (kg/head/yr)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Belgium									
Canada	1.50								1.50
Finland	1.50								1.50
Japan	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Netherlands							1.50	1.50	1.50
United Kingdom	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
United States	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Belgium									
Canada									0.0
Finland									0.0
Japan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands							0.0	0.0	
United Kingdom	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes:
The following Parties are not included in these tables because numerical information for years other than 1998 was not reported:
Austria, Bulgaria, Czech Republic, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, New Zealand, Norway, Slovakia, Spain, Sweden and Switzerland.

Agriculture - manure management, CH_4 (1998)

	4.B Manure management (CH_4)							
	Methods and EF used[a]		Key source	percent of national total	4.B.1 Cattle		4.B.3 Sheep	4.B.8 Swine
	Methods	EF			Dairy cattle	Non-dairy cattle		
					CH_4 IEF			
				%	kg CH_4/head/yr			
IPCC default EF[b]					***6 to 81[b]***	***1 to 38[b]***	***0.19 to 0.37[b]***	***3 to 20[b]***
Australia	CS	CS, D			8.02	0.03		18.07
Austria	C	CS	L	0.7	8.70	4.30	0.22	4.30
Belgium								
Bulgaria	T1, T2	D, CS			18.27	12.26	0.28	9.93
Canada	T1	D	L	0.7	36.00	1.00	0.32	10.00
Czech Republic	T2	CS			3.29	1.01	0.23	7.87
Finland	T2	CS/D			6.98	1.93	0.19	3.40
Greece	T1	D			19.00	13.00	0.28	7.00
Hungary	D	D	L	0.9				
Ireland	D	CS, D	L	2.3	15.90	6.40	0	5.40
Italy			L	0.7				
Japan	D, CS	D, CS			4.93	5.73	0.28	7.92
Latvia					6.00	4.00	0.19	4.00
Lithuania	RA	D			6.00	4.00	0.19	4.00
Netherlands	CS	CS						
New Zealand	T1	CS			0.89	0.91	0.18	NE
Norway	T2	D, CS			14.41	8.55	0.63	1.98
Slovakia	IPCC; CS	IPCC; CS			6.00	4.00	0.19	4.00
Spain								
Sweden	T1, T2	CS			12.37	2.23	0.19	2.58
Switzerland	CS	CS			13.98	3.37	0.13	3.54
United Kingdom	T2	D/CS			10.45	4.38	0.11	3.00
United States	M	M	L	1.2	101.46	2.56	0.33	39.89

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for the various livestock types within the category CH_4 from "4.B manure management".

[b] Source of default emission factors: IPCC Guidelines, Volume 3, Tables 4-5 and 4-6 (pages 4.12 to 4.13). Default emission factors are provided according to climate regions (cool, temperate, warm), as shown in box 1.

Box 1. Default IPCC default emission factors according to climate regions [b]

	Dairy cattle			Non-dairy cattle			Swine		
	cool	temperate	warm	cool	temperate	warm	cool	temperate	warm
North America	36	54	76	1	2	3	10	14	18
Western Europe	14	44	81	6	20	38	3	10	19
Eastern Europe	6	19	33	4	13	23	4	7	11
Oceania	31	32	33	5	6	7	20	20	20
Asia	7	16	27	1	1	2	1	4	7

	Sheep		
	cool	temperate	warm
Developed countries	0.19	0.28	0.37

Agriculture - manure management, N_2O (1998)

	4.B Manure management (N_2O)												
	Methods and EF used[a]		Key source	percent of national total	Animal waste management systems (AWMS)				N - excretion rates				
	Methods	EF			Anaerobic Lagoons 4.B.10	Liquid Systems 4.B.11	Solid Storage and Dry Lot 4.B.12	Other 4.B.13	Dairy Cattle 4.B.1.1	Non-Dairy Cattle 4.B.1.2	Swine 4.B.8	Sheep 4.B.3	Poultry 4.B.9
					N_2O IEF								
				%	kg N_2O-N / kg N				kg N / head / yr				
IPCC default EF					*0.001 (<0.002)*[b]	*0.001 (<0.001)*[b]	*0.02 (0.005-0.03)*[b]	*0.005*[b]	*60 to 100*[c]	*40 to 70*[c]	*16 to 20*[c]	*12 to 20*[c]	*0.6*[c]
Australia	CS	D			0.001	0.001	0.020	0.005	112.6	41.6	9.7	6.5	
Austria	-	-											
Belgium													
Bulgaria	D	D			0.001	0.001	0.020	0.005	70.0	50.0	20.0	16.0	0.60
Canada	T1	D	L	0.7		1,666.155	63,400.131	12,145.360	70.5	56.4	15.0	6.8	0.45
Czech Republic [d]	D	D				1.000	19.995	5.007	100.0	70.0	20.0	20.0	1.00
Finland	D	D/CS				0.001	0.024		100.0	36.0	11.0	17.0	0.40
Greece	T1	D				0.001	0.020	0.005	70.0	50.0	16.0	12.0	0.60
Hungary	D	D				0.001	0.020	1.475	70.0	50.0	20.0		0.60
Ireland	D	CS, D			0.001	0.001	0.020		92.5	50.0	12.0	8.0	0.60
Italy			L	0.7									
Japan	D	CS						954.910	0.2	0.4	0.1		0.00
Latvia					0.001	0.001	0.020	0.005	70.0	50.0	20.0	16.0	0.60
Lithuania					0.001	0.001	0.020		70.0	50.0	20.0	16.0	0.60
Netherlands	CS	CS											
New Zealand					0.001		0.020	0.005	86.7	63.1	16.0	11.8	0.60
Norway	D	D, CS											
Slovakia	IPCC; CS	IPCC; CS				0.001	0.020		90.0	56.0	20.0	16.0	0.60
Spain													
Sweden			L	0.8		0.001	0.020	0.020	118.0	41.6	8.7	5.8	0.40
Switzerland			L	0.8		0.001	0.020		108.7			16.0	0.52
United Kingdom	T1	D/CS			0	0.001	0.016	0.003	108.3	47.8	10.1	6.7	0.71
United States	M	M			0.785				420.5	105.0	112.8	10.7	0.35

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category N2O from "4.B manure management".

[b] Source of default emission factors: IPCC Guidelines, Volume 3, Table 4-22 (pg. 4-104). See also IPCC Good Practice Guidance, Table 4.12 (pg. 4.43).

[c] Source of default N excretion rates: IPCC Guidelines, Volume 3, Table 4-20 pg. 4.99. Default values are provided by regions as shown below:

	North America	Western Europe	Eastern Europe	Oceania	Asia
Dairy cattle	100		70	80	60
Non-dairy cattle	70		50	60	40
Sheep	16	20	16	20	12
Swine	20			16	

[d] The Czech Republic reported activity data for N excretion per AWMS in the unit *t N/year i*nstead of *kg N/year* as required in the CRF. After converting the activity data into *kg N/year* the N_2O IEF (in kg N_2O-N/kg N) per AWMS should read as follows: Liquid systems: 0.001; Solid storage and dry lot: 0.02; Other: 0.005.

Agriculture - agricultural soils, N_2O (1998)

	4.D. Agricultural soils (N2O)													
	Methods and EF used[a]		4.D.1 Direct soil emissions									4.D.2 Animal production		
					Synthetic fertilizers		Animal wastes applied to soils	N-fixing Crops	Crop Residue	Cultivation of histosols				
					Activity data	N_2O IEF	N_2O IEF							
	Methods	EF	Key source[b]	percent of national total[b]	Use of synthetic fertilizers						Key source	per cent of national total	Pasture range and paddock (grazing)	
													N_2O IEF	
					kgN/ yr	kg N_2O-N/ kg N		kg N_2O-N/kg dry biomass[c]		kg N_2O-N / ha			kg N_2O-N/ kg N	
				%										
IPCC default EF						***0.0125 (0.0025 - 0.0225)*** [c]				***5, 10 (2-15)*** [d]			***0.02 (0.005-0.03)*** [e]	
Australia	CS	CS	L	2.4	810,420,667	0.0125	0.0180			0.29	L	0.9	0.0043	
Austria	CS	CS												
Belgium			L	*2.0*										
Bulgaria	D	D, CS	L	10.0	108,105,300	0.0100	0.0040	0.0312	0.000003	0.003			0.0200	
Canada	T1	D	L	3.6	1,652,706,000	0.0055	0.0090	0.0016	0.0002	5.00			0.0200	
Czech Republic	D	D	L	1.8	185,181,300	0.0125	0.0130	0.0127	0.0125				0.0200	
Finland	D	D/CS	L	3.6	168,908,000	0.0125	0.0130	0.0126	0.0125	8.00			0.0190	
Greece	T1	D	L	1.7	306,354,000	0.0112	0.9570	0.0299			L	3.0	0.0199	
Hungary	D	D	L	9.3	223,200,000	0.0125	0.0190			2.00			0.0200	
Ireland	D	CS, D	L	4.7	415,584,000	0.0125	0.0130	NE	NE	NE	L	4.9	0.0200	
Italy			L	1.8							L	0.4		
Japan	D	CS			338,352,567	0.0059	NE	NE	NE	NE			NE	
Latvia			L	*8.6*		0.0125	0.0130	0.0125	0.0125	0.01			0.0100	
Lithuania	RA	D	L	1.3	29,340,000	0.0080	0.0120						0.0050	
Netherlands	CS	CS	L	*3.3*										
New Zealand	D	CS/D	L	2.3	133,312,500	0.0125	0.0120	0.0008	0.0002	4.98	L	7.8	0.0100	
Norway	D	D, CS	L	3.4	112,327,000	0.0119	0.0100			5.00			0.0194	
Slovakia	IPCC; CS	IPCC; CS	L	3.8	97,000,000	0.0112	0.0090	0.0125	0.0125	5.00			0.0200	
Spain			L	*5.1*										
Sweden[f]	D	D	L	3.4	205,600	12.3937	12.5000	0.0004	0.0001	3.25	L	0.7	20.0000	
Switzerland			L	2.3	55,084,000	0.0125	0.0130	0.0004	0.0001	5.00			0.0200	
United Kingdom	T1	D	L	2.0	1,473,210,000	0.0112	0.0125	0.0003	0.0002	500.00	L	0.8	0.0159	
United States	D	D	L	2.7	11,155,981,080	0.0114	0.0100	0.0004	0.0002	8.00			0.0160	

Notes:

[a] Information on methods and emission factors is included in this table as reported by Parties. It may not reflect the actual method or type of emission factor used for all subcategories within the category N2O from "4.D agricultural soils".

[b] Information on key sources and the percent of national total refers to sub-category 4.D.1 direct soil emissions, except for Belgium, Latvia, Netherlands and Spain, where the informatior refers to the entire category 4.D agricultural soils.

[c] Source of default emission factors: IPCC guidelines, Volume 3; Table 4-18, pg. 4.89 (See also Good Practice Guidance, Table 4.17, pg. 4.60). It should be noted that for the sub-sources N-fixing crops and crop residue the IPCC default emission factors are not directly comparable to the N_2O implied emission factors because of the use of different units; the unit of default emission factors is kg N_2O-N/ kg N, while in the CRF the unit relates to the amount of dry biomass (kg N_2O-N/kg dry biomass).

[d] For cultivation of histosols the two default values refer to temperate and tropical, respectively. The values in parenthesis indicate the range. It should be noted that default emission factors for histosols have been updated from 5 to 8 and from 10 to 16 for temperate and tropical, respectively (table 4.17, pg. 4.60 of IPCC good practice guidance).

[e] Source of default emission factor: IPCC Guidelines, Volume 3, Table 4-22, pg. 4.104 (pasture range and paddock). See also IPCC good practice guidance, Table 4-12, pg. 4.43.

[f] In its response to the draft synthesis and assessment report, Sweden explained that the amount of fertilizer was by mistake reported in tons instead of kilograms in the CRF. The corrected N_2O IEF values for fertilizer and pasture range should be 0.012 and 0.02 kg N_2O-N/ kg N, respectively (see also preliminary findings on individual national GHG inventories for Sweden in section II of this report).

Agriculture - Agricultural soils (1998):

Parameters (fractions) used to estimate N_2O emissions in the agricultural soils category (direct and indirect emissions)

	FracBURN	FracFUEL	FracGRAZ	FracNCRBF	FracNCRO	FracR	FracGASF	FracGASM	FracLEACH
	kg N/kg crop-N	kg N/ kg N excreted		kg N/ kg of dry biomass	kg N/ kg of dry biomass	kg N/ kg crop-N	NH_3-N + NO_x-N/ kg of synth fert. N applied	NH_3-N + NOx-N/ kg of N excreted	kg N/ kg of fertilizer or manure N
IPCC defaults [a]	***0.25***	***no default*** [b]	***no default***	***0.03***	***0.015***	***0.45***	***0.1***	***0.2***	***0.3 (0.1 - 0.8)***
Australia	NA	NA	NA	NA	NA	NA	NA	NA	NA
Austria									
Belgium									
Bulgaria	0.10		0.02	0.030	0.015	0.100	0.10	0.20	0.30
Canada	0	0	0	0.030	0.015	0.450	0.10	0.20	0.30
Czech Republic									
Finland	NZ	0	0.30	0.015	0.030	0.450	0.01	0.30	0.15
Greece	0.10	0		0.030	0.015	0.500	0.10	0.20	
Hungary									
Ireland	NO	NO	0.65	NA	NA	NA	0.04	0.17	0.04
Italy									
Japan									
Latvia									
Lithuania	0	0	0.02				0.10	0.20	0.30
Netherlands									
New Zealand	0.05	0		0.030	0.015	0.450	0.10	0.20	0.15
Norway	0	NO	0.23	NE	NE	NE	0.05	0.20	0.18
Slovakia			0.06				0.10	0.20	0.07
Spain									
Sweden	0	0	0.36	0.010	0.019	0.212	0.37	0.08	0.21
Switzerland	0	0					0.07		0.20
United Kingdom		0		0.030	0.015		0.10	0.20	0.30
United States	0.03	NA	0.01	0.008	0.030	0	0.10	0.20	0.30

Abbreviations of fractions:	
FracFUEL	Fraction of livestock N excretion in excrements burned for fuel
FracGRAZ	Fraction of livestock N excreted and deposited onto soil during grazing
FracNCRBF	Fraction of N in non-N-fixing crop
FracNCRO	Fraction of N in N-fixing crop
FracR	Fraction or crop residue removed from the field as crop
FracBURN	Fraction of crop residue burned
FracGASF	Fraction of synthetic fertilizer N applied to soils that volatizes as NH_3 and NO_x.
FracGASM	Fraction livestock N excretion that volatizes as NH_3 and NO_x
FracLEACH	Fraction of N input to soils that is lost through leaching and runoff

Notes:

[a] Source of IPCC default fractions: IPCC Guidelines, Volume 3, Tables 4-19 and 4-24, pg. 4.94 and 4.106 (See also IPCC good practice guidance, Table 4.19, pg. 4.74).

[b] Countries are recommended to obtain country specific data. All Parties that provided a numerical value reported "0" for this parameter.

Trends in N_2O emissions, 1990 to 1998 (Gigagrams and annual percentage change)

	base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia		46.9	47.3	46.9	47.7	48.0	47.1	46.7	49.7	51.8
Austria		3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Belgium									9.3	9.3
Bulgaria	53.9	54.0	49.2	41.9	37.8	36.3	37.0			33.7
Canada		116.0	116.0	114.1	119.3	125.1	125.6	131.9	130.6	130.8
Finland		13.8	12.8	11.6	11.8	11.8	12.3	12.0	11.7	11.5
Greece		20.7	20.6	19.5	19.2	19.3	18.5	18.7	19.0	19.0
Hungary	4.6	4.1	1.7	1.6	1.5	1.8	1.6	1.7	1.7	32.9
Ireland		20.8	20.8	20.5	21.0	21.6	22.2	22.5	21.7	23.0
Italy		65.3	68.1	68.6	69.4	68.6	67.4	66.2	69.0	69.0
Japan		3.8	3.6	3.6	3.6	3.5	3.3	3.1	3.1	3.1
Netherlands		21.5	22.2	25.5	25.4	25.6	26.8	26.8	25.3	25.2
New Zealand		36.8	36.4	36.4	36.8	37.3	37.4	37.2	37.2	37.3
Norway		8.6	8.6	8.3	8.5	8.3	8.5	8.4	8.4	8.5
Slovakia		13.0	10.6	9.3	7.6	7.0	7.3	7.3	7.4	7.3
Spain		58.2	57.6	53.9	46.6	53.5	50.9	61.1	61.1	61.1
Sweden		15.0	0.2	0.2	0.2	0.2	0.2	14.6	13.8	13.8
Switzerland		7.8	7.7	7.6	7.6	7.5	7.4	7.3	7.1	7.1
United Kingdom		95.1	94.6	89.2	87.5	89.9	90.5	90.9	93.8	90.7
United States		890.9	902.9	925.1	913.7	987.6	951.5	974.9	996.3	991.9

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	0.8	-0.8	1.7	0.6	-1.8	-1.0	6.5	4.2	10.4
Austria	0.3	0.3	0.3	-0.9	-1.2	0.0	0.0	0.0	-1.2
Belgium									
Bulgaria	-8.9	-14.8	-9.9	-3.8	1.8	-100.0			-37.5
Canada	0.0	-1.7	4.5	4.9	0.4	5.0	-1.0	0.1	12.7
Finland	-7.0	-9.5	2.0	-0.2	4.2	-2.4	-2.0	-2.3	-16.6
Greece	-0.5	-5.3	-1.5	0.5	-4.1	1.1	1.6	0.0	-8.2
Hungary	-59.0	-3.0	-10.4	23.3	-10.6	4.3	-0.6	1870.7	691.5
Ireland	0.2	-1.5	2.3	2.8	2.9	1.3	-3.4	5.7	10.5
Italy	4.3	0.8	1.2	-1.2	-1.7	-1.9	4.3	0.0	5.7
Japan	-5.6	-0.3	-0.3	-1.7	-6.3	-4.3	-0.6	0.0	-17.7
Netherlands	3.3	14.9	-0.4	0.8	4.7	0.0	-5.7	-0.3	17.1
New Zealand	-1.1	0.0	1.2	1.2	0.3	-0.5	0.1	0.2	1.2
Norway	0.1	-3.4	2.3	-2.1	2.0	-1.9	0.7	0.5	-1.9
Slovakia	-18.5	-12.3	-18.3	-7.5	4.3	-0.7	1.5	-0.4	-43.4
Spain	-1.0	-6.4	-13.5	14.8	-4.9	20.0	0.0	0.0	5.0
Sweden	-98.7	0.0	0.0	0.0	0.0	7215.0	-5.9	0.3	-8.0
Switzerland	-0.6	-1.0	-0.8	-1.3	-1.5	-1.2	-1.7	-1.3	-9.0
United Kingdom	-0.5	-5.8	-1.9	2.7	0.7	0.4	3.2	-3.3	-4.6
United States	1.3	2.5	-1.2	8.1	-3.7	2.5	2.2	-0.4	11.3

Note:

The Czech Republic, Latvia and Lithuania are not included in this table because data for years other than 1998 were not reported.

[a] In accordance with decision 9/CP.2, some Parties with economies in transition use base years other than 1990: Bulgaria (1988) and Hungary (average of 1985-1987). For these Parties, the values in the column "percentage change from 1990 to 1998" refer to the base year data.

Consistency checks performed in the Agriculture sector

The following checks have been performed in order to verify the consistency of the data provided in various CRF tables (1998):
All consistency checks described below have been performed on 1998 inventory data.
Note that only Parties that provided numerical information and for which differences in the data or any other inconsistencies were found were included in the tables below.

1. Comparison of activity data (livestock population size) reported in tables 4.A and 4.B (a). This comparison was made fo*dairy* and *non-dairy cattle, swine* and *sheep.*

	Dairy Cattle			Non-dairy cattle			Swine			Sheep		
	Table 4.A	Table 4.B (a)		Table 4.A	Table 4.B (a)		Table 4.A	Table 4.B (a)		Table 4.A	Table 4.B (a)	
	4.A.1.1	4.B.1.1		4.A.1.2	4.B.1.2		4.A.8	4.B.8		4.A.3	4.B.3	
	Population size		Difference	Population size		Difference	Population size		Difference	Population size		Difference
	1000 heads		%	1000 heads		%	1000 heads		%	1000 heads		%
Netherlands	3,062	no data reported		1,222	no data reported		13,446	no data reported		1,394	no data reported	
United States	9,199.5	9,199.5	-	88,573.14	90,729.58	2.4	62,043.10	62,043.10	-	7,816.60	7,816.60	-

2. Comparison of Total Nitrogen (N) (kg N/yr) reported for *Pasture range and paddock* in Table 4.B (b) with N excretion on *pasture range and paddock* reported under category 4.D.2, Animal production, in Table 4.D.

	Pasture range and paddock N excretion			
	Table 4. B (b)	Table 4. D	Difference	
			A - B	(B-A)/A*100
	kg N / yr	kg N / yr	kg N / yr	%
	A	B	C	D
Australia	2,066,849,938	2,117,284,014	-50,434,075	2.4
Canada	107	321,772,154	-321,772,047	300,721,539.4
Czech Republic [a]	32,617,000	32,618,320	-1,320	0.0
Finland	23,255,276	23,455,277	-200,001	0.9
Greece	383,051,000	383,052,000	-1,000	0.0
Japan	NO	NE		
Lithuania	13,723	13,855	-133	1.0
Norway		20,501,417	no data reported in table 4.B(b)	
Sweden [b]		53,395	no data for pasture range and paddock reported in table 4.B(b)	
United States	8,385,909,981	4,922,790,675	3,463,119,305	-41.3

[a] For the Czech Republic, activity data from table 4.B(b) had to be converted into *kg N/yr* as it was reported in *t N/yr*.

[b] In its response to the draft synthesis and assessment report, Sweden explained that the amount of N from pasture range and paddock was by mistake reported in tons instead of kilograms in the CRF. The corrected value should be 53,395,000 kg N (see also preliminary findings on individual national GHG inventories for Sweden in section II of this report).

3. Comparison of data provided in Table 4.B (b) per livestock type:

Multiplication of livestock population size with the corresponding Nitrogen (N) excretion rate (in kg/head/yr) compared to the sum of N excretion from all animal waste management systems (AWMS).

This comparison has been performed for dairy cattle, non-dairy cattle and sheep based on 1998 inventory data.
Note that only Parties that provided numerical information and for which differences in the data or any other inconsistencies were found were included in the tables below.

	population size * N excretion	sum N excretion all AWMS	Difference (B-A)/A*100
	kt	kt	%
	A	B	C
Dairy cattle			
Canada	844.0	0.0001	-100.0
Czech Republic [a]	64.4	48.9	-24.0
Greece	16.7	13.7	-18.0
Hungary	28.5	28.2	-1.0
Japan	0.5	0.0005	-99.9
Lithuania	37.9	0.0375	-99.9
Slovakia [a]	25.6	25.5	-0.2
United States of America	5,463.0	NA	NA
Non-dairy cattle			
Canada	98.4	0.0001	-100.0
Czech Republic [a]	73.2	87.9	20.1
Greece	18.0	14.8	-18.0
Japan	0.7	0.0007	-99.9
Lithuania	19.3	1.6	-91.9
Slovakia [a]	23.6	23.5	-0.2
Sheep			
Canada	3.0	0.0001	-100.0
Lithuania	0.3	0.0003	-99.9
Slovakia [a]	5.22	5.16	-1.1
United States of America	83.9	76.3	-9.0

[a] For some of the data to be reported in table 4B(b) of the CRF, the Czech Republic and Slovakia did not report their data in the units required by the CRF. In these cases, data were re-converted to CRF units to facilitate data comparison across Parties.

4. Waste

Waste - solid waste disposal on land, waste-water handling and waste incineration (1998)

	6. Waste																							
	Activity data		6.A Solid Waste Disposal on Land							6.B Wastewater handling										6. C Waste incineration			
			CH_4							CH_4								N_2O from human sewage		CO_2 from non-biogenic waste			
	population (million)		Methods and EF used		key source	Percent of national total	emissions per capita[c]	CH_4 IEF		Methods and EF used		key source	percent of national total	emissions per capita[c]	CH_4 IEF				emissions per capita[c]	N_2O IEF	Methods and EF used		key source[b]	IEF
	CRF	IEA[a]	Methods	EF				managed	unmanaged	methods[h]	EF				domestic/ commercial		industrial				methods	EF		
						%	kg	t/t	t/t				%	kg	waste water	sludge	waste water	sludge	kg	kg N_2O -N/kg sewage N				kg/t
IPCC default EF[d]																				0.01 (0.002-0.12)					
Australia	18.85	18.75	T2	M	L	2.9	35.8	0.06	NE	T2	D			3.48					NE	NE	T2	CS		NA
Austria	8.07	8.08	CS	CS	L	5.5	26.1	0.06		C	CS			1.77							C	CS		3,224
Belgium		10.20				2.6	17.6							0.24										
Bulgaria	8.23	8.26	D	CS	L	7.1	34.4	0.09		D	CS	L	1.90	9.44	0.06	0.06	0.04	0.04	0.074	0.01				NA
Canada		30.30		CS	L	3.1	33.6			CS	CS			0.62					0.101		CS	CS		
Czech Republic[g]		10.30	T1,T3	CS	L	2.4	7.9	0.05		D	D,CS			1.62	0.04	0.01	0.01	0.01	0.063	24.98[g]				3,500
Finland	5.16	5.15	D	D	L	2.4	17.0	0.05		D	CS			0.31	0.01		0.00		0.055					
Greece	11.35	10.51	T1	D	L	2.5	14.3	0.04	0.04	T1	D			0.73	0.25				NE	NE				
Hungary	10	10.11	CS	CS	L	1.8	7.2			D	D	L	1.40	5.54							CS	CS	L	1.71[e]
Ireland	3.52	3.71	D	CS,D	L	2.5	20.5	0.07	0.04	NA	NA			NE	NA	NA	NA	NA	NE	NE	NA	NA		NA
Italy		56.98			L	1.8	8.0					L	0.50	2.27										
Japan		126.49	M,CS	CS			2.8	0.37	NO	CS	CS			0.06			NE	NE	NE	NE	CS	CS	L	2,555
Latvia	2.45	2.45			L	5.0	11.1	0.60	0.160										0.101					
Lithuania	3.80	3.70	RA	D	L	6.0	18.4	0.05						0.14	-									
Netherlands		15.70	M,CS	CS	L	4.0	28.3	80.89						0.08					0.039					
New Zealand	3.80	3.79	D,CS	D	L	3.3	31.4	0.04		D,CS	D,CS			1.78					0.124					
Norway		4.42	M	CS	L	7.1	43.0	0.12		M	CS			0.09					0.087					
Slovakia	5.39	5.39	IPCC,T1	CS	L	1.8	8.6			IPCC,T1, ISI	IPCC,C S	L	1.08	5.06	0.13	0.19	0.03	0.18	0.093	0.01				
Spain		39.37			L	4.1	18.5												0					
Sweden		8.85	CS	CS	L	1.7	6.9							1.38										
Switzerland	7.12	7.11	CS	CS	L	2.0	8.7			CS	CS			0.22					0.010		CS	CS	L	[f]
United Kingdom	59.24	59.24	M	CS	L	2.4	13.1	9.65	NA	M	CS			0.59	IE	0.02	NE	NE	0.009	0.01	T2	CS		
United States		269.09	M	M	L	3.0	38.2	30.19		D	D			0.61	0.03				0.095	0.01	CS	CS		2,827

Notes:

[a] Source of population data: CO_2 emission from fuel consumption, 1971-1998, IEA, Paris, 2000.

[b] For Hungary, Japan and Switzerland, CO2 from waste incineration represented 0.7, 1.8 and 2.4 percent of the national total, respectively.

[c] Emissions per capita were calculated using population data from the IEA (see footnote a).

[d] Source of default emission factor: IPCC Good Practice Guidance, Vol. 3, p. 6.28.

[e] For Hungary the IEF refers to biogenic and non-biogenic wastes which were reported all together.

[f] No IEF for CO2 from non-biogenic wastes was reported because activity data was reported for biogenic and non-biogenic wastes all together.

[g] In its response to the draft synthesis and assessment report, the Czech Republic explained that the N_2O IEF value for human sewage was accidentally misreported in the CRF.

The corrected value should be 0.16 (see also preliminary findings on individual national GHG inventories for the Czech Republic in section II of this report).

Waste - solid waste disposal on land

Trends in CH_4 emissions per capita*, 1990 to 1998
(kg CH4 per capita and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	37.96	37.92	37.97	38.88	38.29	36.87	36.63	36.77	35.84
Austria	33.55	32.48	31.67	30.59	29.76	28.95	28.33	27.35	26.07
Belgium								18.09	17.60
Bulgaria	80.25	87.60	83.97	77.14	48.08	47.58			34.42
Canada	31.75	32.43	32.66	32.99	33.00	32.74	32.79	33.20	33.61
Finland	34.76	31.54	27.85	24.14	22.26	22.06	20.36	18.74	17.02
Greece	23.05	23.65	24.40	25.19	26.07	26.85	27.62	28.23	29.20
Hungary		6.60	6.58	6.62	6.64	6.66	6.69	6.71	7.16
Ireland	24.21	24.50	24.94	24.98	25.14	25.24	25.25	23.95	20.46
Italy	7.68	7.78	6.93	7.07	8.01	8.16	8.14	8.06	8.05
Japan	3.14	3.04	2.96	2.92	2.91	2.92	2.88	2.84	2.84
Netherlands	37.60	36.90	35.57	34.15	32.84	30.98	30.71	29.72	28.34
New Zealand	40.63	39.23	36.92	38.30	37.85	35.82	35.36	32.42	31.37
Norway	42.85	43.22	42.89	43.50	43.60	44.00	44.38	44.01	42.97
Slovakia	9.52	9.52	9.47	9.43	9.40	9.55	11.16	9.48	8.50
Spain	10.61	11.31	11.87	12.82	13.76	14.62	15.58	16.65	18.53
Sweden	9.93	9.86	9.79	9.75	6.95	6.91	6.90	6.89	6.89
Switzerland	9.97	9.58	9.46	9.45	9.29	9.20	9.02	8.86	8.71
United Kingdom	19.41	18.61	17.72	16.88	16.18	15.56	14.83	14.00	13.07
United States	40.70	40.18	40.41	40.41	40.09	40.15	39.57	39.39	38.16

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-0.1	0.1	2.4	-1.5	-3.7	-0.7	0.4	-2.5	-5.6
Austria	-3.2	-2.5	-3.4	-2.7	-2.7	-2.1	-3.5	-4.7	-0.2
Belgium								-2.7	
Bulgaria	9.2	-4.1	-8.1	-37.7	-1.0				-57.1
Canada	2.1	0.7	1.0	0.0	-0.8	0.2	1.2	1.2	5.9
Finland	-9.3	-11.7	-13.3	-7.8	-0.9	-7.7	-8.0	-9.2	-51.0
Greece	2.6	3.2	3.2	3.5	3.0	2.9	2.2	3.5	26.7
Hungary		-0.3	0.6	0.3	0.3	0.4	0.3	6.8	
Ireland	1.2	1.8	0.1	0.6	0.4	0.1	-5.2	-14.6	-15.5
Italy	1.3	-11.0	2.0	13.4	1.9	-0.3	-0.9	-0.2	4.8
Japan	-3.1	-2.6	-1.3	-0.5	0.5	-1.6	-1.4	0.0	-9.5
Netherlands	-1.9	-3.6	-4.0	-3.8	-5.7	-0.9	-3.2	-4.7	-24.6
New Zealand	-3.4	-5.9	3.8	-1.2	-5.4	-1.3	-8.3	-3.2	-22.8
Norway	0.9	-0.8	1.4	0.2	0.9	0.9	-0.8	-2.4	0.3
Slovakia	0.0	-0.6	-0.4	-0.4	1.6	16.9	-15.1	-10.3	-10.8
Spain	6.6	5.0	8.0	7.3	6.2	6.6	6.9	11.3	74.7
Sweden	-0.7	-0.7	-0.5	-28.7	-0.6	-0.1	-0.1	0.0	-30.6
Switzerland	-3.9	-1.3	0.0	-1.7	-0.9	-2.0	-1.8	-1.7	-12.7
United Kingdom	-4.1	-4.8	-4.7	-4.1	-3.8	-4.7	-5.6	-6.7	-32.7
United States	-1.3	0.6	0.0	-0.8	0.1	-1.4	-0.4	-3.1	-6.2

Note
The following Parties are not included in this table because data for years other than 1998 were not reported: Czech Republic, Lativa, Lithuania
* Emissions per capita were calculated using population data from the IEA.

Waste - waste-water handling

Trends in CH_4 emissions per capita*, 1990 to 1998
(kg CH4 per capita and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	3.47	3.44	3.44	3.48	3.48	3.48	3.48	3.48	3.48
Austria	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.77
Belgium								0.24	0.24
Bulgaria	18.78	15.19	14.05	12.97	10.44	16.74			9.44
Canada	0.61	0.61	0.61	0.61	0.61	0.61	0.62	0.62	0.62
Finland	0.34	0.31	0.30	0.31	0.32	0.32	0.31	0.30	0.31
Greece	0.71	0.71	0.72	0.71	0.72	0.72	0.73	0.73	0.73
Hungary		18.26	18.18	18.24	18.23	18.23	18.24	18.23	5.54
Italy	2.05	2.06	2.08	2.07	2.16	2.21	2.22	2.28	2.27
Japan	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Netherlands	0.42	0.42	0.42	0.41	0.33	0.10	0.04	0.08	0.08
New Zealand	1.83	1.77	1.78	1.84	1.84	1.80	1.80	1.80	1.78
Norway	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Slovakia	6.84	6.33	5.96	5.24	5.31	5.35	5.27	5.29	5.06
Spain	1.13	1.16	1.17	1.19	1.26	1.29	1.31	1.35	1.38
Switzerland	0.20	0.20	0.20	0.21	0.21	0.21	0.21	0.22	0.22
United Kingdom	0.58	0.54	0.60	0.59	0.62	0.59	0.59	0.59	0.59
United States	0.60	0.60	0.60		0.60	0.60	0.60	0.60	0.61

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia	-1.0	0.0	1.2	0.0	-0.1	0.0	0.0	-0.1	0.0
Austria	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
Belgium								-0.2	
Bulgaria	-19.1	-7.5	-7.7	-19.5	60.4				-49.7
Canada	0.0	0.0	0.0	0.1	0.1	1.1	0.1	-0.1	1.3
Finland	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-9.8
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Hungary		0.0	0.0	0.0	0.0	0.0	0.0	-0.7	
Italy	0.3	0.9	-0.3	4.2	2.3	0.5	2.6	-0.2	10.8
Japan	2.7	0.0	7.8	-6.4	-1.4	8.9	5.7	3.8	21.9
Netherlands	-0.3	0.0	-1.9	-19.5	-70.7	-62.2	128.6	-0.6	-80.2
New Zealand	-3.5	0.6	3.5	-0.2	-2.2	0.0	0.0	-0.8	-2.7
Norway	0.0	0.5	-0.5	-0.1	0.3	0.0	0.1	-0.1	0.2
Slovakia	-7.4	-5.9	-12.0	1.3	0.7	-1.4	0.4	-4.4	-26.0
Spain	2.7	0.9	2.1	5.1	2.5	1.4	3.6	1.8	21.9
Switzerland	-1.2	0.7	2.9	0.9	1.1	1.6	1.7	1.7	9.8
United Kingdom	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0
United States	-0.2	0.0			0.0	0.0	-0.3	0.9	0.7

Note
The following Parties are not included in this table because data for years other than 1998 were not reported: Czech Republic, Lativa, Lithuania and Sweden. Ireland reported zero for all years.
* Emissions per capita were calculated using population data from the IEA.

Trends in N_2O emissions per capita*, 1990 to 1998
(kg N2O per capita and annual percentage change)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Australia	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bulgaria	0.091	0.088	0.082	0.080	0.077	0.077			0.074
Canada	0.101	0.101	0.101	0.101	0.101	0.101	0.102	0.102	0.101
Finland	0.072	0.069	0.066	0.063	0.063	0.062	0.059	0.058	0.055
Greece	NE	NE	NE	NE	NE	NE	NE	NE	NE
Japan	NE	NE	NE	NE	NE	NE	NE	NE	NE
Netherlands	0.033	0.033	0.033	0.033	0.033	0.032	0.036	0.040	0.039
New Zealand	0.131	0.125	0.126	0.129	0.130	0.126	0.127	0.125	0.124
Norway	0.069	0.069	0.068	0.071	0.074	0.077	0.081	0.087	0.087
Slovakia	0.097	0.091	0.085	0.090	0.084	0.086	0.086	0.086	0.085
Switzerland	0.009	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.010
United Kingdom	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
United States	0.092	0.093	0.093	0.093	0.095	0.093	0.094	0.094	0.095

Relative change to previous year (%)

	1991	1992	1993	1994	1995	1996	1997	1998	Percentage change from 1990 to 1998
Australia									
Bulgaria	-3.3	-6.8	-3.2	-3.3	0.5				-18.6
Canada	0.0	0.0	0.0	0.0	0.0	1.0	-0.1	-0.8	0.1
Finland	-4.2	-4.2	-4.3	-0.5	-1.3	-4.2	-2.3	-5.7	-23.8
Greece									
Japan									
Netherlands	-0.8	-0.7	-0.7	-0.6	-0.5	11.5	10.1	-0.6	18.1
New Zealand	-4.5	0.8	2.6	0.8	-3.6	0.8	-1.3	-0.8	-5.3
Norway	-0.5	-0.7	3.1	5.3	3.2	5.9	7.3	-0.5	25.4
Slovakia	-5.9	-6.8	6.3	-6.6	2.6	-0.2	-0.7	-0.2	-11.6
Switzerland	-1.8	0.9	2.3	0.4	1.2	2.5	1.2	1.1	8.1
United Kingdom	4.6	0.0	-4.6	0.2	0.0	0.0	0.0	0.0	0.0
United States	0.6	0.0	0.0	2.5	-1.9	0.6	0.6	0.2	2.4

Note
The following Parties are not included in this table because data for years other than 1998 were not reported: Belgium, Czech Republic, Hungary, Italy, Lativa, Lithuania and Sweden. Austria, Ireland and Spain reported zero for all years.

* Emissions per capita were calculated using population data from the IEA.