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EXECUTIVE BODY FOR THE CONVENTION ON
LONG-RANGE TRANSBOUNDARY AIR POLLUTION

Steering Body to the Cooperative Programme
for Monitoring and Evaluation of the Long-range
Transmission of Air Pollutants in Europe (EMEP)
(Twenty-third session, Geneva, 6-8 September 1999)
(Item 6 (a) of the provisional agenda)

PRESENT STATE OF EMISSION DATA

Note by the Meteorological Synthesizing Centre-West
prepared in consultation with the secretariat

Summary

This document summarizes official information about the emissions of SO₂, NO_x, NH₃, NMVOC, CO, CH₄, CO₂, HMs and selected POPs for 1980-1997 and projections for 2000, 2005 and 2010. Reporting according to the new draft procedure has improved considerably since last year, especially with regard to national emissions by sector. Sulphur dioxide emissions continue to decline (down 55% in the EMEP area between 1980 and 1997). For the other major components, downward trends are less pronounced. The Convention's emission database has been further developed at MSC-W. To facilitate dissemination of information, parts of it are now available on the Internet (<http://www.emep.int>). More features are to appear by the end of 1999.

Documents prepared under the auspices or at the request of the Executive Body for the Convention on Long-range Transboundary Air Pollution for GENERAL circulation should be considered provisional unless APPROVED by the Executive Body.

Introduction

1. Under the Convention on Long-range Transboundary Air Pollution, the supply of high-quality emission data is essential in assessing the state of air pollution in Europe, and in establishing the compliance of the Parties with protocol commitments. The Convention's emission database is managed by the Meteorological Synthesizing Centre-West (MSC-W) of EMEP. Closer cooperation with the Chemical Coordinating Centre (CCC), the Meteorological Synthesizing Centre-East (MSC-E), as well as the European Environment Agency (EEA) and its Topic Centre on Air Emissions, is very important to improve quality control of emission data and ensure a well-functioning database.
2. The ECE emission inventorying activities are greatly assisted by the Task Force on Emission Inventories under EMEP. Its major output has been the first and second editions of the Joint EMEP/CORINAIR Atmospheric Emission Inventory Guidebook. The Task Force will continue to update the Guidebook (see EB.AIR/GE.1/1999/7).

I. REPORTING PROCEDURE

A. Approach and time schedule

3. Parties to the Convention submit their official emission data and agreed related information to the ECE secretariat. The secretariat then forwards these official submissions to MSC-W for storage and management. CCC cooperates with MSC-W and MSC-E in evaluating and making expert emission estimates for selected heavy metals (HMs) and persistent organic pollutants (POPs) for use in model runs at MSC-E for those parts of Europe without official national emission data. MSC-E has assisted the Commonwealth of Independent States (CIS) by organizing training (in Russian) in the use of the Guidebook. Cooperation between MSC-W and the European Topic Centre on Air Emissions needs to be further strengthened, in particular in exchanging emission data and in developing data evaluation procedures.
4. The good functioning of EMEP requires proper adherence to the approved timetable for the reporting of emission data, measurements of air and precipitation quality and model calculations by the Parties, the EMEP centres and the secretariat. The timetable for the emission and modelling activities under the Convention is presented in figure 1. In early autumn, Parties are requested to submit their emission data before 31 December for the preceding year, including possible updates to previous figures. The quality of the national totals should be controlled within three months of receipt. During this time Parties may complete missing data, correct or add to their initial data submission. This is fairly consistent with the timetable for reporting monitoring data, since by June Parties should also complete their reporting to CCC. Emissions and the activities of MSC-E, MSC-W and CCC are reported to the Steering Body of EMEP in September. The main results are submitted to the Executive Body at its annual session in November/December.
5. The Parties should report their 1998 emission data by 31 December 1999 for finalization by March 2000.

B. Reporting guidelines

6. The application of the Atmospheric Emission Inventory Guidebook, the inclusion of HMs and POPs in the ECE database, the increasing modelling requirements and other recent developments, meant that the old reporting guidelines (EB.AIR/GE.1/R.65) need to be revised. In 1997, a proposal for estimating and reporting emission data under the Convention (EB.AIR/GE.1/1997/5) was drafted for consideration by the Steering Body at its twenty-first session (EB.AIR/GE.1/1997/2, paras. 19-21). This proposal covers the emissions of sulphur dioxides (SO₂), nitrogen oxides (NO_x), ammonia (NH₃), non-methane volatile organic compounds (NMVOCs), methane (CH₄) and carbon monoxide (CO), HMs (priority metals: cadmium (Cd), mercury (Hg), lead (Pb)) and selected POPs. Carbon dioxide (CO₂) is to be reported as under the United Nations Framework Convention on Climate Change, as previously agreed under the Convention.

7. The revised draft guidelines distinguish between general reporting and specific reporting for atmospheric modelling. General reporting specifies the timetable to be followed, the pollutants of interest, the type of data required (national annual totals and sectoral emissions at SNAP level 1), and the procedure for reporting and updating emission projections.

8. Specific reporting for atmospheric modelling distinguishes further between a required minimum reporting and a recommended extended reporting. Minimum reporting requires submission of spatial distribution of annual totals and source sector split data in the 50 km x 50 km EMEP grid every five years, reporting on gridded low (below 100 m) and high (above 100 m) emissions, and annual updates on any substantial changes in the distribution of emissions (e.g. in large point sources). Extended reporting recommends reporting of monthly resolution of national totals and, for the 11 main source sectors (SNAP level 1), historical emissions of POPs, the size, spatial and height distribution of HMs other than the three priority ones, gridded land-use statistics (periodically), and specified information on individual large point sources (within certain time intervals).

9. The draft guidelines specify a detailed electronic data format for reporting to make it easier to process the vast amount of gridded and sectoral data received. The data format is available on the EMEP website (<http://www.emep.int>). Parties are requested to provide their data both on paper and electronically. The emission estimation methodology used by the Party must be indicated clearly.

10. Emission inventory experts have been invited to comment on the draft reporting procedure. Their reactions will be considered in the finalization of the draft guidelines.

II. THE UN/ECE EMISSION DATABASE**A. State of the official emission data**

11. With regard to emissions, the goals under the Convention can be

summarized as follows. All gaps in the time series of national annual total and sectoral (SNAP level 1) emissions from 1980 onwards will be covered using harmonized emission inventory methodologies as soon as possible and at the latest during the 2005 inventory. Moreover, EMEP aims at having full sets of gridded data for national total and sectoral emissions for every five years starting from 1980 and updates in the years in between.

12. At present there are 44 Parties to the Convention: 41 European countries, Canada, the United States and the European Community.

13. The official emission data are presented in the tables below. In particular, tables 1-7, 17 and 18 list the national annual totals for the major pollutants, HMs and selected POPs, respectively. Tables 8-11, 15 and 16 summarize the type of information available for these pollutants. All data included in the tables are as received by 28 June 1999.

14. To facilitate verification of compliance with the major requirements of the Protocols, tables 12-14 and the associated figures 7-9 give information on the SO₂, NO_x and VOC emission reductions as percentages of the values in the reference years. For the 1985 Sulphur Protocol the reference year is 1980, for the 1988 NO_x Protocol it is 1987, for the 1991 VOC Protocol it is 1988. Both Parties and non-Parties to the respective protocols are listed in the tables. Progress with respect to the 1994 Protocol on further reduction of sulphur emissions will be assessed in the next reporting.

15. The great majority of Parties have difficulties complying with the time schedule for emission reporting. Only 10 of the 28 reports submitted during the last round of reporting were received in time. Such delays hinder the modelling work of EMEP and often mean that very late submissions are excluded from the annual modelling activities.

16. Overall, the reporting has improved substantially since last year. For the traditional pollutants, annual totals for 1997 have been reported by just over half the Parties. On average the number of national reports received in 1997 has increased by about 22% compared to that of last year for 1996. For the national sectoral totals (at SNAP level 1), the corresponding increase is 38%. With regard to projections and reporting of gridded national totals, there has been only a minor improvement. The number of Parties reporting HMs and POPs has increased since last year by about 10% and 33%, respectively.

17. Concentrating more on the sectoral data, 41 Parties have reported emissions at SNAP level 1 for at least one year and component so far, while 3 have submitted corresponding gridded data. Sectoral data at SNAP level 2 have been reported by five Parties to date, and at SNAP level 3 by one Party.

18. Eleven Parties indicated the emission estimation methodology that they had followed. Only four Parties submitted their data in the specified electronic format.

B. Other emissions included in the UN/ECE emission database

19. The EMEP modelling area has been extended to the east to fully cover the Mediterranean Sea. Emissions over the additional Asiatic and African regions included have been drawn from open sources such as the inventorying activities of GEIA and RIVM.

20. Marine exhaust emissions of SO₂, NO_x, NMVOC and CO in the North-East Atlantic Ocean, the North Sea and the Baltic Sea as estimated by Lloyd's Register of Shipping are used. These emissions refer to 1990 and are based on a 50 km x 50 km spatial distribution. Corresponding releases over the Mediterranean Sea also need to be assessed in the future.

21. Emission estimates from CCC and the International Institute for Applied Systems Analysis (IIASA) along with some emission data collected under the CORINAIR programme are also included in the UN/ECE emission database. Marine biogenic emissions include only sulphur (DMS) estimates.

C. Emission trends in the EMEP area

22. For the modelling purposes of EMEP, missing annual figures are inter- or extrapolated from the values in adjoining years. When official information is not available, emissions are replaced by estimates based on information from available open sources and often in collaboration with CCC and IIASA. Wherever possible, figures reported under the CORINAIR Programme (1985, 1990 and 1994) substitute missing values. When projections are not available, the 1990 value is employed up to 2010. All data used in the MSC-W model runs will be presented in the technical report to the Steering Body at its twenty-third session (EMEP/MSC-W Note 1/99).

23. Provided that all gaps are filled in the time series of reported emission data, it is possible to calculate the development of total (anthropogenic and natural) emissions over the EMEP area since 1980. Figures 2-6 illustrate such emission trends for SO₂, NO_x, NH₃, NMVOC and CO, respectively.

24. European sulphur dioxide emissions (figure 2) experience a clear downward trend. The total emission of SO₂ in 1997 decreased by 55% compared to the 1980 level. The trend in the emission of NO_x (figure 3) is characterized by relatively high releases in the late 1980s and an easing-off in the 1990s. The 13% reduction in 1997 compared to the 1980 level reaches 17% when 1987 (base year of the NO_x Protocol) is used as a reference instead. European emissions of ammonia (figure 4) dropped by approximately 15% between 1990 and 1997. The almost constant emission trend before 1990 is primarily a result of assumptions made to fill in the large amount of missing data for most countries. NMVOC emissions (figure 5) refer to anthropogenic releases only. There is a slight downward trend in the 1990s, leading to a drop of approximately 17% in 1997 compared to 1988 (base year of the VOC Protocol). In the case of CO (figure 6), a reduction of 26% between 1990 and 1997 is clear. Projection emissions appear higher than those in late 1990s due to replacement of missing values with the 1990 levels.

III. MAJOR REMARKS

25. Emission reporting under the Convention has improved substantially since last year, especially with regard to national sectoral totals at SNAP level 1.

26. Parties should make greater efforts to report within the established deadlines and in the specified electronic format. The latter is absolutely necessary to enable effective and error-free data processing.

27. Filling in missing data, completing inadequate reporting and updating old data according to the most recent applied methodologies remain vital requirements. Modification of SNAP 1 sector 11 requires updates of figures for previous years accordingly. Parties are requested once more to address these issues carefully in their next reporting for the year 1998.

28. For the modelling activities of EMEP, submission of complete information on sector split emission data and a clear distinction between low (below 100 m) and high (above 100 m) sources for each EMEP grid square are needed. As most Parties have not supplied such information so far, efforts need to be intensified in the next reporting.

29. The new emission database system developed at MSC-W is now operational, resulting in more efficient storage, retrieval and further distribution of data. However, it is difficult to transfer the vast amount of old data into the system, since these submissions are available only on paper. Parties are therefore requested to submit updated data from the 1980s in the electronic format specified.

30. Emission tables and maps for the major pollutants are available on the EMEP web site (<http://www.emep.int>). New elements such as national sectoral totals at SNAP level 1 will appear during 1999.

31. MSC-W will apply methods for validating emission data in cooperation with the other relevant actors.

32. To harmonize inventorying activities, a stronger interaction between MSC-W and EEA is needed to improve the exchange of information and resolve inconsistencies in their databases.

33. Given the importance of reporting procedures in improving data comparability and in harmonizing emission inventorying activities in the ECE region, the draft reporting procedure should be finalized based on the experience and comments of the three-year trial period and later on be revised as often as necessary. The importance of a better vertical distribution of releases and temporal variation per source category, as well as the inclusion of more sub-sectors (SNAP level 2) as a basic element in verification procedures, should also be considered in this process.

In this document, any data provided under the heading «Yugoslavia» relate to the Federal Republic of Yugoslavia, which, in accordance with General Assembly resolutions 47/1 and 47/229 of 22 September 1992 and 5 May 1993, respectively, cannot continue automatically the membership of the former Socialist Federal Republic of Yugoslavia.

Table 1. Anthropogenic emissions of sulphur (1980-2010*) in the ECE region
(thousands of tonnes of SO₂ per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*
Armenia	111	101	101	97	100	111	111	104	63	72	60	44	6	4	3	2	2	0.4	-	-	-
Austria	400	349	329	246	218	195	176	160	115	102	91	83	60	56	52	52	52	57	60	-	-
Belarus	740	730	710	690	690	690	690	761	720	668	637	652	458	382	324	275	246	208	552	490	480
Belgium	828	712	694	560	500	400	377	367	354	325	328	334	318	297	253	246	241	216*	248	232	215
Bosnia and Herzegovina	2050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	4643	4291	3612	3625	3955	3692	3627	3762	3838	3695	3236	3245	3117	3008	2651	2681	2722 ^m	2813	2833	2914	2914
Canada	150	-	-	-	-	-	-	-	-	180	108	107	114	89	89	68	72	80	133	125	117
Croatia	-	-	-	-	-	37	37	41	43	47	55	41	45	43	46	46	46	47	43	37	376*
Cyprus	2257	2341	2387	2338	2305	2277	2177	2164	2066	1998	1876	1776	1538	1419	1270	1091	946	701	462*	421*	90
Czech Republic	450	362	369	313	295	339	282	250	242	191	182	243	190	156	155	150	186	109	90	90	-
Denmark	584	534	484	372	368	382	331	328	302	244	260	194	141	124	112	96	105*	100*	116	-	-
Finland	3338	2588	2490	2094	1866	1470	1342	1290	1226	1334	1250	1369	1201	1061	1009	958	947	-	868*	770*	737*
France	3164 ^b	3008 ^b	2841 ^b	2664 ^b	2576 ^b	2367 ^b	2228 ^b	1904 ^b	1215 ^b	942 ^b	5313	3996	3299	2938	2466	2102	1543	1468	1300 ^b	990 ^b	550 ^b
Germany	4350	4433	4599	4682	5057	5365	5413	5443	5263	5254	-	-	-	-	-	-	-	-	-	-	-
Germany, former GDR ^l	400	-	-	-	-	500	-	-	-	509	552	554	550	538*	553*	553*	543*	-	595	580	570
Greece ^o	1633	1580	1545	1480	1440	1404	1362	1285	1218	1102	1010	913	827	762	741	705	673	657	898	816	653
Hungary	18	18	18	19	18	18	18	16	18	17	24	23	24	25	24	24	24	24	25	29	30
Iceland	222	192	158	142	140	162	174	152	162	178	179	161	157	177	161	147	165*	155	155	155	155
Ireland	3757	3330	2850	2463	2114	1901	1929	2029	1963	1854	1651	1539	1394	1333	1271	1322	-	-	1004	847	842
Italy	0.39	0.37	0.34	0.32	0.29	0.27	0.25	0.22	0.20	0.17	0.15	0.15	0.14	0.14	0.13	-	-	-	0.11	0.11	-
Liechtenstein	311	312	304	310	303	304	316	316	300	298	222	234	139	125	117	94	93	77	164	155	145
Lithuania	24	-	-	14	-	17	-	-	-	15	-	-	-	-	-	13	9	8	-	4	-
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	490	464	404	323	299	258	264	263	250	204	202	173	172	164	146	147	135	124	92	92	98
Netherlands ^h	137	128	111	104	96	98	91	73	68	58	53	44	36	35	34	34	33	30	34*	-	-
Norway	4100	-	-	-	-	4300	4200	4200	4180	3910	3210	2995	2820	2725	2605	2376	2368	2181	-	-	-
Poland	266 ⁱ	-	-	-	-	198	-	-	-	362	352	420	356	336	373	-	-	-	304	294	130
Portugal	305	287	284	270	282	297	317	273	238	231	184	184	126	36	23	27	19	17	140	130	130
Republic of Moldova ^p	308	305	287	284	270	282	297	317	273	238	231	184	126	36	23	27	19	17	140	130	130
Romania	1055	1095	1104	1229	1223	1255	1293	1305	1469	1517	1311	1041	951	928	912	2838	2685*	2449*	4440	4297	4297
Russian Federation ^q	7161	6949	7090	6934	6503	6191	5707	5622	5145	4677	4460	4392	3839	3456	2983	2339	227	702*	210	210	210
Slovakia	780	-	-	-	-	613	604	614	589	573	543	446	380	325	239	239	119	110	120	92	45
Slovenia	234	254	256	274	250	241	247	222	210	212	194	181	190	183	177	119	110	120	92	45	37
Spain	3072	3066	2938	2956	2714	2574	2456	2330	2016	2336	2266	2223	2195	2060	2065	1927	-	-	2143	-	-
Sweden	491	431	371	305	296	266	272	228	224	160	119	96	88	87	82	79	83	69	72	67	67
Switzerland	116	-	-	-	84	76	68	62	56	49	43	41	38	34	34	34	30	26	26	26	27
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	860	-	-	-	276	322	354	-	-	3073	2782	2538	2376	2194	1715	1639	1293	1132	2310	2310	2310
Ukraine	3849	3492	3427	3498	3470	3463	3393	3264	3211	3073	2782	2538	2376	2194	1715	1639	1293	1132	2310	2310	2310
United Kingdom	4862	4408	4194	3854	3692	3729	3900	3887	3816	3693	3731	3548	3456	3139	2679	2343	2017	1656	1290	1020	850
United States	23501	22251	20993	20449	21292	20452	20238	20654	20781	20989	20408	20176	19849	19289	16830	17337	-	-	15614	16250	16250
Yugoslavia ^t	406	408	409	440	456	478	470	484	502	506	508	446	396	401	424	462	434	522	680	889	1135
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.

^a Preliminary data.

^b Figures apply to the Federal Republic of Germany prior to 1989.

^c Based on the IPCC methodology.

^e Figures apply to the European part within EMEP.

^f Drawn from the 1994 Sulphur Protocol.

^g Emissions from stationary sources only.

^h Figures for 1990-1996 have been recalculated

ⁱ 2/3 of the estimated SO₂ emissions are emitted as H₂S from geothermal exploitation.

^j Emissions from international air traffic, marine bunkers and managed forests are not included.

^k Projection reflects the politically determined intention to reach a specific target.

^l Including mobile sources.

^m Forecast value from the 1990 RDIS-based NAICC Consensus Forecast.

ⁿ Source: 2nd Report of the Government of FRG Pursuant to the UNFCCC, scenario 'with measures'.

^o Figures for 1990-1996 are based on the IPCC methodology. Projection figures are upper limit values.

^p Figures for 1980-1994 do not include mobile sources.

^q Refers to Skopje only.

28.06.1999

Table 2. Anthropogenic emissions of nitrogen oxides (1980-2010*) in the ECE region
(thousands of tonnes of NO₂ per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*
Armenia	-	15	17	17	16	45	53	52	56	51	46	40	22	12	12	15	11	15	-	-	-
Austria	231	223	221	219	218	220	217	213	203	196	194	198	188	176	184	170	163	172	154	154	154
Belarus	234	235	235	237	240	238	258	263	262	263	285	281	224	207	203	195	173	189	217	184	180
Belgium	442	-	-	-	-	325	317	338	345	357	323	335	343	341	342	336	325	310*	-	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	1959	1907	1897	1884	1871	2038	2043	2131	2204	2188	2104	2003	1997	2006	2026	2032	2011*	-	2061	2057	2085
Canada ¹	-	-	-	-	-	-	-	-	-	-	87	64	56	59	65	64	67	74	87	83	83
Croatia	-	-	-	-	-	16	16	16	18	19	20	17	20	21	21	21	21	21	23	23	23
Cyprus	937	819	818	830	844	831	826	816	858	920	742	725	698	574	435	412	432	423	372*	362*	351*
Czech Republic	282	248	267	261	273	301	320	312	302	282	282	321	276	274	272	250	288	248	203	192	-
Denmark	295	276	271	261	257	275	277	288	293	301	300	290	283	282	282	259	267*	260*	224	224	224
Finland	1823	1701	1688	1645	1632	1615	1618	1630	1615	1772	1879	1941	1876	1773	1745	1726	1695	-	-	-	-
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany ¹	2617 ^b	2542 ^b	2525 ^b	2572 ^b	2598 ^b	2540 ^b	2546 ^b	2427 ^b	2306 ^b	2146 ^b	2693	2521	2308	2151	2020	1946	1887	1803	-	2130*	1263*
Germany, former GDR ¹	717	717	694	686	707	736	740	750	743	746	-	-	-	-	-	-	-	-	-	-	-
Greece ^o	-	-	-	-	-	306	-	-	-	-	343	353	352	349	358*	358*	374*	-	-	-	-
Hungary	273	270	268	266	264	262	264	265	258	246	238	203	183	184	188	190	196	198	230	210	196
Iceland	21	21	21	22	22	21	22	24	25	25	26	27	28	29	29	28	30	29	28	29	30
Ireland	73	86	86	85	84	91	100	115	122	125	115	119	125	122	117	115	121	124*	105	105	105
Ireland	1638	1604	1605	1583	1596	1614	1690	1811	1854	1917	1938	1984	2010	1990	1789	1768	-	-	1620	1508	1436
Italy	-	-	-	-	-	-	-	-	-	-	93	61	53	46	48	42	35	-	36	70	81
Latvia ^c	0.71	0.71	0.70	0.69	0.68	0.67	0.66	0.65	0.65	0.64	0.63	0.61	0.58	0.56	0.54	-	-	-	0.41	0.37	-
Liechtenstein	152	154	156	158	162	166	169	171	172	173	158	166	98	78	77	65	65	57	109	110	110
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg	23	-	21	-	-	21	-	-	-	-	23	-	-	-	23	20	22	-	19	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands ^b	583	575	562	555	573	589	587	599	602	584	580	568	556	535	510	498	501	470	-	249	327
Norway	188	177	181	186	200	210	226	225	221	220	218	208	207	215	212	212	220	222	158*	-	-
Norway	1229	-	-	-	-	1500	1510	1530	1550	1480	1280	1205	1130	1120	1105	1120	1154	1114	-	-	879*
Poland	-	-	-	-	-	96	-	-	-	-	348	367	391	382	391	407	-	-	-	-	-
Portugal	58	57	50	42	44	67	72	71	74	70	63	67	39	15	18	24	11	30	30	35	34
Republic of Moldova	523	528	516	542	546	542	559	580	590	579	546	464	357	318	319	-	-	-	-	-	-
Romania	1734 ^b	1915 ^b	2002 ^b	1976 ^b	1879 ^b	1903 ^b	1871 ^b	2653 ^b	2358 ^b	2553 ^b	3600	3325	3093	3054	2685	2570	2467	2379	-	-	-
Russian Federation ^c	-	-	-	-	-	-	-	197	-	-	227	225	212	190	183	173	181	130	123	-	-
Slovakia	51	52	52	51	52	53	58	57	59	58	62	54	55	61	66	67	70	71	45	38	31
Slovenia	1056	982	980	991	985	950	978	1023	1052	1153	1177	1227	1251	1223	1241	1243	-	-	-	-	-
Spain	404	417	412	401	411	426	432	437	432	418	338	339	329	324	331	301	302	280	273	208	200
Sweden	170	-	-	-	177	179	177	174	172	170	166	160	153	145	139	136	130	125	117	110	113
Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6 ⁱ	-	-	-
Turkey	275	275	300	316	336	364	396	426	412	464	497	512	535	562	-	692	-	955	1226	1670	
Ukraine	1145	1145	1153	1153	1102	1059	1112	1094	1090	1065	1097	989	830	700	568	531	467	455	1094	1094	1094
United Kingdom	2511	2416	2396	2396	2346	2333	2512	2618	2675	2720	2686	2584	2510	2345	2252	2104	2029	1848	1557	1295	1161
United States	22501	22397	21819	21704	22581	21308	21169	20689	22250	21825	21584	21566	21897	22210	22582	21714	21222	-	19592	19183	19141
Yugoslavia ¹	47	50	50	53	58	58	58	60	63	62	66	57	49	54	52	59	57	66	88	115	147
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.
^a Preliminary data.
^b Figures apply to the Federal Republic of Germany as prior to 1989.
^c Based on the IPCC methodology.
^e Figures apply to the European part within EMEP.
^g Emissions from stationary sources only.
^h Figures for 1990-1996 have been recalculated.
ⁱ Emission levels include estimated impacts of planned reduction initiatives.
^j Emissions from international air traffic, marine bunkers and managed forests are not included.
^k Projection reflects the politically determined intention to reach a specific target (here 1998 value).
^l Updated emissions from transport.
ⁿ Forecast value from the 1990 RDIS-based NAICC Consensus Forecast.
^o Figures for 1990-1996 are based on the IPCC methodology.
^p Not including all sources.
^q Source: 2nd Report of the Government of FRG Pursuant to the UNFCCC, scenario 'with measures'.
^r According to the Current Legislation Scenario (CLE).
^s Not including mobile sources.
^t Refers to Skopje only.

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Table 3. Anthropogenic emissions of ammonia (1980-2010*) in the ECE region
(thousands of tonnes of NH₃ per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*
Armenia	-	3	3	3	3	2	2	2	2	0.2	0.6	0.11	0.05	0.01	0.006	0.006	0.004	0.004	-	-	-
Austria	80	80	80	82	82	82	82	81	81	78	76	73	74	75	78	78	76	75	-	-	-
Belarus	-	-	-	-	-	-	-	-	-	-	4	-	-	-	4	5	4	4	5	4	4
Belgium	-	-	-	-	-	89	-	-	-	-	104	93	92	97	96	97	99	99*	-	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	-	-	-	-	-	-	-	-	-	-	144	124	111	109	101	99	83	77	109	126	126
Canada	-	-	-	-	-	-	-	-	-	-	37	31	27	25	24	25	23	24	33	33	33
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-	-	156	134	115	99	91	86	81	81	-	-	-
Denmark	141	138	134	132	126	126	122	117	115	113	122	110	114	119	113	114	99	102	103	-	-
Finland	-	-	-	-	-	-	-	-	-	-	35	-	-	-	-	35	35*	34*	32	23	23
France	-	-	-	-	-	-	-	-	-	-	807	801	790	780	786	794	807	-	-	-	-
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany ^j	572 ^b	557 ^b	564 ^b	576 ^b	585 ^b	588 ^b	580 ^b	572 ^b	560 ^b	556 ^b	764	676	655	646	650	646	649	648	-	-	-
Germany, former GDR ^j	263	264	253	265	268	269	266	265	270	262	-	-	-	-	-	-	-	-	-	-	-
Greece	196 ^d	-	-	-	-	189 ^d	-	-	-	-	164 ^d	134 ^d	123 ^d	115 ^d	114 ^d	116 ^d	78	76	170	160	150
Hungary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	479	475	464	504	481	487	495	497	499	481	466	451	440	449	459	461	-	-	443	446	449
Italy	-	-	-	-	-	-	-	-	-	-	44	42	33	20	17	17	-	-	-	-	-
Latvia ^m	0.14	-	-	-	0.15	-	-	-	-	-	0.15	-	-	-	-	-	-	-	0.15	0.15	0.15
Liechtenstein	85	86	86	87	88	89	89	89	89	86	84	85	81	80	80	38	36	35	84	84	84
Lithuania	-	-	-	-	-	-	-	-	-	-	7	-	-	-	7	-	-	-	6	-	-
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands ^a	234	240	244	244	246	248	258	258	237	232	226	228	180	191	166	146	146	145	-	82	136
Norway	23	23	23	23	23	23	23	23	23	23	23	24	25	25	25	26	27	26	-	-	-
Poland	550	-	-	-	-	550	550	550	550	550	508	450	447	382	384	380	364	350	-	-	-
Portugal	-	-	-	-	-	-	-	-	-	-	98	98	96	94	94	97	-	-	-	-	-
Republic of Moldova	-	-	-	-	-	-	-	-	-	-	0.14	0.19	0.03	0.10	0.11	0.07	0.08	0.06	0.15	0.15	0.15
Romania	340	332	327	311	359	343	350	329	339	341	300	267	255	223	221	-	-	-	-	-	-
Russian Federation ^a	1189 ^f	1192 ^f	1214 ^f	1245 ^f	1247 ^f	1239 ^f	1286	1277	1269	1258	1191	1161	1084	903	772	824	749	730	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	62	-	61	-	40 ^h	45 ^h	50 ^h	50	-	-	-
Slovenia	-	-	-	-	-	-	-	-	-	-	24	-	-	-	22	22	-	-	27	27	27
Spain	299	289	308	310	314	317	328	356	357	367	353	354	352	345	352	348	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	54	-	51	51	61	61	61	61	61	64	64	48	48
Switzerland	77	-	-	-	-	74	-	-	-	-	72	-	-	-	-	71	71	71	70	69	68
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey ⁱ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine ^l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom ^k	-	-	-	-	-	-	-	-	-	-	333	-	-	-	-	-	319	323	-	-	-
United States	-	-	-	-	-	-	-	-	-	-	1685 ^f	-	-	-	-	-	-	-	-	-	-
Yugoslavia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.
^a Preliminary data.
^b Figures apply to the Federal Republic of Germany as prior to 1989.
^c Based on the IPCC methodology.
^d No information as to whether nature is included.
^e Figures apply to the European part within EMEP.
^f Agricultural sector only.
^g Rough estimate.
^h Figures for 1990-1996 have been recalculated.
ⁱ Emissions from international air traffic, marine bunkers and managed forests are not included.
^k 20 tonnes of natural emissions (1996 value) subtracted from the reported years.
^l Reported figures refer only to SNAP sector 3 and are not included in the table.
^m Emissions from agriculture are according to the PARCOM-ATMOS guidelines.
ⁿ Preliminary figure, based on the CORINAIR '94 methodology.

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Table 4. Anthropogenic emissions of NMVOCs (1980-2010*) in the ECE region
(thousands of tonnes of NMVOC per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*
Armenia	-	26	24	24	22	93	98	104	93	90	81	70	31	20	17	23	18	35	-	-	-
Austria	355	354	352	355	362	361	374	377	379	369	351	323	296	284	274	270	261	253	266	266	266
Belarus	549	546	543	543	540	516	506	509	535	511	533	546	412	372	366	367	328	345	380	323	321
Belgium	-	-	-	-	-	660*	-	-	-	-	299	-	302	302	301	295	283	276	272*	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	2099	-	-	-	-	2851	2859	2897	2964	2906	2880	2792	2730	2763	2752	2742	-	-	2694	2790	2927
Canada ¹	-	-	-	-	-	-	-	-	-	-	105	84	63	68	73	72	79	82	100	100	100
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	275 ¹	-	-	-	435	398	359	338	310	286	286	284	272	-	-	-
Czech Republic ¹	-	-	-	-	-	-	-	-	-	178	183	177	169	167	161	136	137	136	-	-	-
Denmark	203	199	199	202	206	209	212	212	211	205	209	-	-	195	-	186	173*	174*	150	-	-
Finland	-	-	-	-	-	-	-	210	213	-	2469	2466	2407	2306	2221	2156	2075	-	-	-	-
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany ¹	2522 ^b	2450 ^b	2460 ^b	2458 ^b	2474 ^b	2447 ^b	2456 ^b	2427 ^b	2372 ^b	2295 ^b	3195	2781	2535	2306	2169	1981	1877	1807	-	-	1100*
Germany, former GDR ¹	702	702	674	694	717	743	762	793	816	851	-	-	-	-	-	-	-	-	-	-	-
Greece ¹	-	-	-	-	-	614 ¹	-	-	-	-	373	378	379	381	389	397	409	-	-	-	-
Hungary	215	-	-	-	-	232	263	228	215	205	205	150	142	149	142	150	150	145	180	160	145
Iceland	8	8	8	8	8	8	8	12	13	13	13	14	14	14	14	12	12	10	8	7	7
Ireland	-	-	-	-	-	-	-	-	-	-	197	200	199	202	175	176	103	105*	171	138	138
Italy	2179	2119	2074	2045	2007	1992	2019	2088	2124	2215	2213	2293	2338	2344	2349	2368	-	-	1791	1543	1440
Latvia ^c	-	-	-	-	-	-	-	-	-	-	152	97	63	98	101	70	41	-	96	118	204
Liechtenstein	1.48	1.49	1.49	1.50	1.51	1.52	1.53	1.53	1.54	1.55	1.56	1.49	1.43	1.36	1.30	-	-	-	0.92	0.86	-
Lithuania ^m	100	102	104	105	106	108	108	108	109	109	103	106	60	46	46	75	79	78	86	84	84
Luxembourg	-	-	-	-	-	17	-	-	-	-	20	-	-	-	19	18	18	-	13	-	-
Malta	-	-	-	-	-	-	-	-	-	-	502	462	438	405	389	365	362	340	196	-	247
Netherlands ^b	-	-	-	-	-	302	-	-	-	-	310	309	331	347	358	370	368	359	195*	-	-
Norway	180	184	191	204	216	234	253	259	248	284	831	833	805	756	819	769	766	774	806	-	954*
Poland	1036	912	889	954	985	1011	1029	1014	1026	1016	640	652	668	672	690	691	-	-	-	-	-
Portugal	-	-	-	-	-	199	-	-	-	-	76	40	25	24	24	43	18	40	50	70	70
Republic of Moldova	-	-	-	-	-	-	-	102	102	96	139	76	40	25	24	43	18	40	50	70	70
Romania	673 ^c	654 ^c	616 ^c	640 ^c	656 ^c	631 ^c	674 ^c	728 ^c	690 ^c	656	616	522	497	502	505	-	-	-	-	-	-
Russian Federation ^e	2843 ^c	2843 ^c	2582 ^c	2444 ^c	2390 ^c	2496 ^c	2338 ^c	2807 ^c	2790 ^c	3715 ^c	3566 ^c	3259 ^c	3204 ^c	2979	2861	2507	2576	2338	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	149	-	-	117	108	119	105	-	-	-	-
Slovenia	-	-	-	-	-	-	-	-	39	-	42	-	-	-	42	42	-	-	33	30	25
Spain	931	918	918	938	920	936	969	1015	1048	1098	1134	1190	1207	1189	1199	1162	-	-	446	417	296
Sweden	-	-	-	-	-	-	-	-	555	-	292	274	256	239	226	211	203	195	162	150	143
Switzerland	323	-	-	-	324	324	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	1626	1660	1687	1604	1512	1369	1302	1171	972	1024	811	718	665	1369	1369	1369
United Kingdom ^p	2309	2287	2329	2338	2405	2399	2441	2481	2557	2699	2552	2497	2398	2293	2237	2121	2046	1954	1514	1336	1344
United States	23596	22346	21324	22428	21325	21978	21301	21041	21924	20306	19037	19142	18774	18956	19547	18676	17315	-	14641	13696	13418
Yugoslavia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.
a Preliminary data.
b Figures apply to the Federal Republic of Germany as prior to 1989.
c Based on the IPCC methodology.
d Figures apply to the European part within EMEP.
e From 1990 onwards, data were corrected based on more precise estimates from agriculture.
f Including CH₄ in the 1985 figure.
g Figures for 1990-1996 have been recalculated.
h Emission levels include estimated impacts of planned reduction initiatives.
i Emissions from international air traffic, marine bunkers and managed forests are not included.
j Emissions from international air traffic, marine bunkers and managed forests are not included.
k Projection reflects the politically determined intention to reach a specific target (here 1999 value).
l Including CH₄.
m 8 ktonnes of natural emissions (1995 value) subtracted from all years 1980-1994.
n 156 ktonnes of natural emissions (1989 value) subtracted from all years 1980-1988.
o 80 ktonnes of natural emissions subtracted from all years 1980-2010.
p Non-energy related emissions only. Source: 2nd Report of the Government of FRG Pursuant to the UNFCCC, scenario 'with measures'.
q Figures for 1990-1996 are based on the IPCC methodology.
r According to the Current Legislation Scenario (CLE).

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Table 5. Anthropogenic emissions of carbon monoxide (1980-2010*) in the ECE region
(thousands of tonnes of CO per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*
Armenia	-	-	-	-	-	405	405	417	417	399	304	377	195	145	128	174	125	224	-	-	-
Austria	1690	1624	1563	1529	1582	1529	1623	1576	1526	1460	1287	1267	1186	1159	1131	1014	1021	1012	-	-	-
Belarus	-	-	-	-	-	1654	1605	1601	1590	1615	1722	1717	1381	1201	1241	1253	1242	1223	1409	1406	1404
Belgium	-	-	-	-	-	-	-	-	-	-	1112	1120	1138	1229	1054	1032	1018	981*	-	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	997	995	985	891	608	768	830	858	846	613	515	820	800	750
Bulgaria	-	-	-	-	-	9685	-	-	-	-	10596	10153	9855	9851	9747	9653	-	-	9182	9809	10550
Canada ¹	10273	-	-	-	-	-	-	-	-	-	651	564	414	370	367	340	375	366	660	660	660
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	895	899	740	738	884	1055	1102	1045	967	1026	874	886	877	-	-	-
Czech Republic	894	-	906	-	-	730	754	785	791	783	794	808	779	730	720	713	597	557	647	562	-
Denmark	681	685	690	701	-	-	-	-	-	-	556 ^d	-	467	432	443	434	430*	430*	-	-	-
Finland	660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France ²	9216	9146	8858	8648	8529	8399	8156	8036	7821	7575	10210	10407	9955	9486	8775	8420	8177	-	-	-	-
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany ¹	11006 ^b	10031 ^b	9483 ^b	9122 ^b	9232 ^b	8975 ^b	8921 ^b	8612 ^b	8284 ^b	7876 ^b	11165	9484	8360	7615	7174	6885	6717	6374	-	-	5400 ^c
Germany, former GDR ¹	3040	2996	2955	2858	2944	3159	3214	3324	3212	3109	-	-	-	-	-	-	-	-	-	-	-
Greece ²	1019	-	-	-	-	931	-	-	-	-	1338	1375	1304	1289	1296	1318	1334	-	-	-	-
Hungary	-	-	-	-	-	46	48	54	57	57	58	59	61	60	60	49	50	39	27	21	19
Iceland	44	44	44	43	44	-	-	-	-	-	429	428	403	416	333	306	307	333*	322	322	322
Ireland	7588	7478	7527	7432	7590	7692	7607	7674	7581	7735	7824	8003	7961	7755	7549	7255	-	-	5814	4851	4213
Italy	-	-	-	-	-	-	-	-	-	-	388	733	453	528	307	454	176	-	-	-	-
Latvia ^c	-	-	-	-	-	-	-	-	-	-	247	216	204	192	180	-	-	-	-	-	-
Liechtenstein	419	400	380	361	342	323	304	285	266	247	568	521	599	501	292	286	312	358	411	410	400
Lithuania	541	548	543	550	550	547	554	564	578	568	175	-	-	-	145	105	103	-	-	-	-
Luxembourg	-	-	-	-	-	192	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	1381	-	-	-	-	1143	1025	983	960	907	892	903	842	-	-	-
Netherlands ^a	-	-	-	-	-	886	918	877	903	867	856	794	782	781	766	728	695	656	-	-	-
Norway	866	851	861	854	882	886	918	877	903	-	7406	-	7083	8655	5115	4547	4837	4700	-	-	-
Poland	-	-	-	-	-	-	-	-	-	-	1020	1114	1222	1264	1301	1326	-	-	-	-	-
Portugal	55 ^m	51 ^m	56 ^m	49 ^m	48 ^m	483	478	474	496	476	471	350	204	128	98	169	81	152	160	150	150
Republic of Moldova	3245	3217	3152	3030	3463	3307	3378	3196	3317	3314	3186	2695	2506	2434	2325	-	-	-	-	-	-
Romania	13520	15005	13617	13696	13672	14122	13142	13119	12988	13054	13174	12869	11574	11193	10495	9846	9312	10262	-	-	-
Russian Federation ^e	-	-	-	-	-	-	-	-	-	-	491	487	440	381	408	412	401	346	345	-	-
Slovakia	68	66	63	61	64	69	78	79	75	75	79	75	77	87	93	91	95	92	57	44	31
Slovenia	4328	4180	4182	4256	4256	4234	4283	4420	4662	4873	4752	4822	4787	4801	4645	4371	-	-	-	-	-
Spain	-	-	-	-	-	-	-	-	-	-	1210	1212	1176	1148	1142	1088	1082	962	871	600	450
Sweden	-	-	-	-	-	990	-	-	-	-	707	665	621	578	549	510	485	458	408	369	370
Switzerland	1280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	9832	9722	9269	9085	8794	8141	7406	5496	4218	3375	2906	2567	2516	8141	8141	8141
Ukraine	-	-	-	-	-	7642	7543	7634	7479	7529	7249	7288	7278	7334	7543	7111	6955	6547	6025	5677	5000
United Kingdom	105872	102968	100690	105582	104711	104912	100157	98174	106295	94754	87576	89324	86295	86448	90427	81394	79246	-	-	-	-
United States ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yugoslavia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.
a Preliminary data.
b Figures apply to the Federal Republic of Germany as prior to 1989.
c Based on the IPCC methodology.
d No information as to whether nature is included.
e Figures apply to the European part within EMEP.
f 1980-1989 data do not include all sources; from 1994 onwards emissions from machinery are updated.
g Figures for 1990-1996 have been recalculated.
h Figures for 1990-1996 have been recalculated.
i Emission levels include estimated impacts of planned reduction initiatives.
j Emissions from international air traffic, marine bunkers and managed forests are not included.
k Source: 2nd Report of the Government of FRG Pursuant to the UNFCCC, scenario 'with measures'.
l No information as to whether nature is included in the figures for 1980-1995.
m Not including mobile sources.
n Refers to Skopje only.

28.06.1999

Table 6. Anthropogenic emissions of methane (1980-2010*) in the ECE region
(thousands of tonnes of CH₄ per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*				
Armenia	-	-	-	-	-	-	-	-	-	-	153	-	-	-	-	-	-	-	-	-	-				
Austria	438	442	447	453	461	464	469	468	470	464	460	448	446	449	451	450	447	440	-	-	830	930	1000		
Belarus ^f	-	-	-	-	-	-	-	-	-	-	955	-	-	-	-	430	-	-	-	-	-	-	-	-	
Belgium	-	-	-	-	-	-	-	-	-	-	573	578	586	587	585	585	585	578*	-	-	-	-	-	-	
Bosnia and Herzegovina	-	-	-	-	-	-	-	646	660	638	757	582	624	664	528	511	495	533	451	420	420	420	420		
Bulgaria	2072	2682	2739	2759	2785	2847	2691	2801	2934	2987	3300	3400	3500	3700	3800	3900	-	-	-	-	-	3474	-		
Canada	-	-	-	-	-	-	-	-	-	-	169	160	145	147	138	134	134	128	128	150	150	150	150		
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cyprus	-	-	-	-	-	-	-	-	-	-	779	710	668	633	614	599	573	562	-	-	-	-	-	-	
Czech Republic ^k	-	-	-	-	-	-	-	434	426	424	427	432	437	452	439	441	425	423	355	354	-	-	-	-	
Denmark	479	476	469	470	457	452	447	434	426	424	249	-	244	243	247	245	255*	246*	-	-	-	-	-	-	
Finland	-	-	-	-	-	-	-	-	-	-	2862	2840	2767	2704	2670	2642	2566	-	-	-	-	-	-	-	
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Georgia	492 ^h	480 ^h	469 ^h	459 ^h	453 ^h	460 ^h	458 ^h	445 ^h	434 ^h	433 ^h	5566	5013	4673	4268	4024	3902	3573	3564	3892 ^h	3004 ^h	3004 ^h	3004 ^h	3004 ^h		
Germany ^l	1196	1218	1222	1241	1266	1310	1295	1299	1307	1289	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Germany, former GDR ^l	-	-	-	-	-	-	-	-	-	-	437	438	438	441	450	454	457	-	-	-	-	-	-	-	
Greece ^k	-	-	-	-	-	-	-	-	-	-	-	914	808	792	776	708	-	-	-	-	-	-	-	-	
Hungary	1115	-	-	-	-	1172	-	-	-	-	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
Hungary ^h	15	15	15	15	15	15	15	14	14	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iceland	15	15	15	15	15	15	15	15	15	15	800	800	800	800	807	814	736	755*	800	-	-	-	-	-	
Ireland	2176	2172	2151	2234	2206	2231	2276	2313	2344	2330	2341	2390	2362	2461	2559	2555	-	-	-	-	-	-	-	-	
Italy ^h	-	-	-	-	-	-	-	-	-	-	186	183	150	105	98	101	93	-	-	-	-	-	-	-	-
Latvia ^h	-	-	-	-	-	-	-	-	-	-	0.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	0.74	-	-	-	0.71	-	-	-	-	-	281	296	275	265	263	241	227	244	338	332	332	332	332	332	
Lithuania ^h	256	272	250	276	295	301	309	313	310	298	24	-	-	-	22	22	23	-	-	-	-	-	-	-	
Luxembourg ^h	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	971	875	876	1009	1039	1177	1049	1047	1024	1039	1293	1300	1253	1223	1203	1173	1233 ^h	1167	1091	-	-	-	-	-	
Netherlands ^h	267	271	276	281	285	290	295	299	298	312	317	322	328	333	340	343	345	350	-	-	-	-	-	-	
Norway	-	-	-	-	-	-	-	-	-	-	5715	-	3647	2990	1841	1792	2146	2145	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-	-	-	-	810	813	799	788	795	834	-	-	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Moldova	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Moldova	2302	2272	2127	2181	2254	2217	2384	2641	2444	2265	1864	1634	1462	1462	1442	-	-	-	-	-	-	-	-	-	
Romania ^h	5462 ^h	5414 ^h	5396 ^h	5423 ^h	5441 ^h	5427 ^h	5400 ^h	5428 ^h	5358 ^h	5312 ^h	5174 ^h	4923 ^h	4649 ^h	3680 ^h	3542 ^h	3400 ^h	3136 ^h	1508	-	-	-	-	-	-	
Russian Federation ^h	-	-	-	-	-	-	-	-	-	-	397 ^h	371 ^h	348 ^h	323 ^h	308 ^h	306	299	301	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	169	-	-	-	162	166	-	-	-	-	-	-	-	-	-
Slovakia	1473	1606	1761	1770	1792	1819	1922	1951	1983	2111	2185	2166	2259	2310	2336	2377	-	-	-	-	-	-	-	-	
Spain	-	-	-	-	-	-	-	-	-	-	324	325	321	321	303	297	297	260	283	271	262	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	-	-	244	-	-	-	-	235	235	232	229	211	192	-	-	-	-
Switzerland	312	-	-	-	-	287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	4823	4818	4800	4779	4029	4505	4665	4608	4551	4498	4439	4411	4345	4018	3800	3774	3714	3629	3418	3227	2852	-	-	-	
United States	-	-	-	-	-	-	-	-	-	-	27550 ^h	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yugoslavia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.

a Preliminary data.

b Figures apply to the Federal Republic of Germany as prior to 1989.

c Based on the IPCC methodology.

d No information as to whether nature is included.

e Figures apply to the European part within EMEP.

f Drawn from a national report on greenhouse gases.

g Source: 2nd Report of the Government of FRG Pursuant to the UNFCCC, scenario 'with measures'.

h Figures for 1990-1996 have been recalculated.

j Emissions from international air traffic, marine bunkers and managed forests are not included.

k The figure for 1996 was calculated using a revised emission factor.

l 20400 to 34700 tonnes.

m 58 tonnes of natural emissions (1995 value) subtracted from all years 1990-1994.

n 1 tonne of natural emissions (1995 value) subtracted from all years 1990-2000.

p 91 tonnes of natural emissions (1989 value) subtracted from all years 1980-1988.

q These data reflect the actual observed emissions without temperature corrections and also cover sources not to be reported in IPCC tables.

Table 7. Anthropogenic emissions of carbon dioxide (1980-2010*) in the ECE region
(millions of tonnes of CO₂ per year)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000*	2005*	2010*	
Armenia	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-	-	-	-	-	-	-	54
Austria	65	61	58	57	59	60	59	60	57	58	62	66	60	59	59	59	62	-	62	-	62	74
Austria ¹	-	-	-	-	-	-	-	-	-	-	102	-	-	-	67	61	-	-	-	-	74	87
Belarus ¹	-	-	-	-	-	-	-	-	-	-	116	120	118	116	121	122	129	-	-	-	-	-
Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	92	-	76	-	62	-	63	-	-	-	-	-	-	88
Bulgaria ¹	-	-	-	-	-	-	-	-	490	466	461	452	465	467	477	495	-	-	-	-	-	518
Bulgaria ²	440	442	401	387	404	421	416	434	466	490	461	452	465	467	477	495	-	-	-	-	-	30
Canada ¹	-	-	-	-	-	-	-	-	-	-	23	19	17	18	18	17	18	18	20	26	30	33
Croatia	-	-	-	-	3	3	3	4	4	4	5	5	5	5	6	6	6	6	6	6	7	8
Cyprus	-	-	-	-	-	180	179	178	173	170	163	148	134	129	124	123	129	130	134*	148*	161*	
Czech Republic ¹	196	53	55	53	54	61	62	60	56	51	52	63	57	59	63	59	73	63	63	54	52	
Czech Republic ²	63	53	55	53	54	61	62	60	56	51	52	63	57	59	63	59	73	63	63	54	52	
Denmark	54	45	43	42	43	50	48	52	52	52	59	53	52	53	59	61	66*	65*	-	-	-	
Denmark ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland ¹	503	453	432	413	403	388	374	368	371	384	383	409	395	378	377	382	396	-	-	-	-	
Finland ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	867*
Georgia	782 ^b	758 ^b	722 ^b	722 ^b	733 ^b	723 ^b	729 ^b	716 ^b	707 ^b	692 ^b	1014	977	927	917	904	904	919	894	894*	894*	867*	
Germany ¹	323	325	323	320	337	353	355	358	352	348	-	-	-	-	-	-	-	-	-	-	-	-
Germany, former GDR ¹	48	92	92	91	90	89	87	87	84	81	74	67	61	61	59	60	67	64	69	73	77	
Greece ¹	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
Hungary	2	2	2	2	2	2	2	2	2	2	31	31	31	32	33	34	36	-	-	-	-	
Hungary ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	364	352	345	339	342	345	363	377	391	403	412	404	415	403	391	416	-	-	-	-	-	
Ireland ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	0.15	0.15	0.13	0.13	0.15	0.18	0.17	0.18	0.18	0.20	0.21	0.21	0.22	0.22	0.22	0.22	-	-	-	-	-	0.25
Italy ¹	46	46	45	45	44	45	46	47	47	46	42	45	29	25	25	18	19	19	40	38	35	35
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	167	-	-	-	-	150	-	-	-	-	165	171	169	172	174	182	190*	187*	163*	-	-	-
Netherlands ¹	33	31	31	32	34	32	35	34	35	35	35	34	34	36	38	38	41	41	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Moldova	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania ¹	184	184	180	184	193	189	195	196	201	189	171	141	126	123	121	-	-	-	-	-	-	1900
Romania ²	1400	1425	1450	1475	1500	1560	1600	1700	1650	1725	1670	1630	1630	1450	1580	1500	1500*	1500*	1760	-	-	-
Russian Federation ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia ¹	14	15	15	15	15	14	16*	14	14	14	14*	13	13	13	13	14*	15	15	16	12	12	11
Slovakia ²	226	227	228	230	222	220	222	227	228	255	259	263	270	262	272	279	-	-	-	-	-	231
Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	82	74	69	64	63	67	68	67	63	64	55	55	55	56	56	58	63	56	60	62	64	64
Sweden ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweden ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey ¹	76	76	88	88	94	102	112	120	115	128	137	141	147	153	-	-	-	-	-	-	-	247
Turkey ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United States	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yugoslavia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community	2850	2715	2620	2575	2605	2660	2700	2600	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Projections based on current reduction plans.

a Preliminary data.

b Figures apply to the Federal Republic of Germany as prior to 1989.

c Based on the IPCC methodology.

d No information as to whether nature is included.

e Figures apply to the European part within EMEP.

f Drawn from a national report on greenhouse gases.

g Emissions from fossil fuels and peat.

h Figures for 1990-1996 have been recalculated.

i Including emissions from marine and air bunkers.

j Emissions from international air traffic, marine bunkers and managed forests are not included.

k CO₂ data is Baseline scenario; CO₂ mitigation and energy scenarios also reported for 1988,1990,1992,1994,2000,2005 and 2010.

l Emissions from combustion only.

m The 1990 figure is without climatic correction. For 2000 the figure is with climatic correction.

n Including emissions from production processes (non-combustion).

o Figures for 1980-1993 exclude biomass fuels and biomass-related wastes. The figure for 1980 includes international transport.

p Reflecting the actual observed emissions without temperature corrections and covering sources not to be reported in IPCC tables.

q Source: 2nd Report of the Government of FRG Pursuant to the UNFCCC, scenario 'with measures'.

r Figures for 1990-1996 are based on the IPCC methodology.

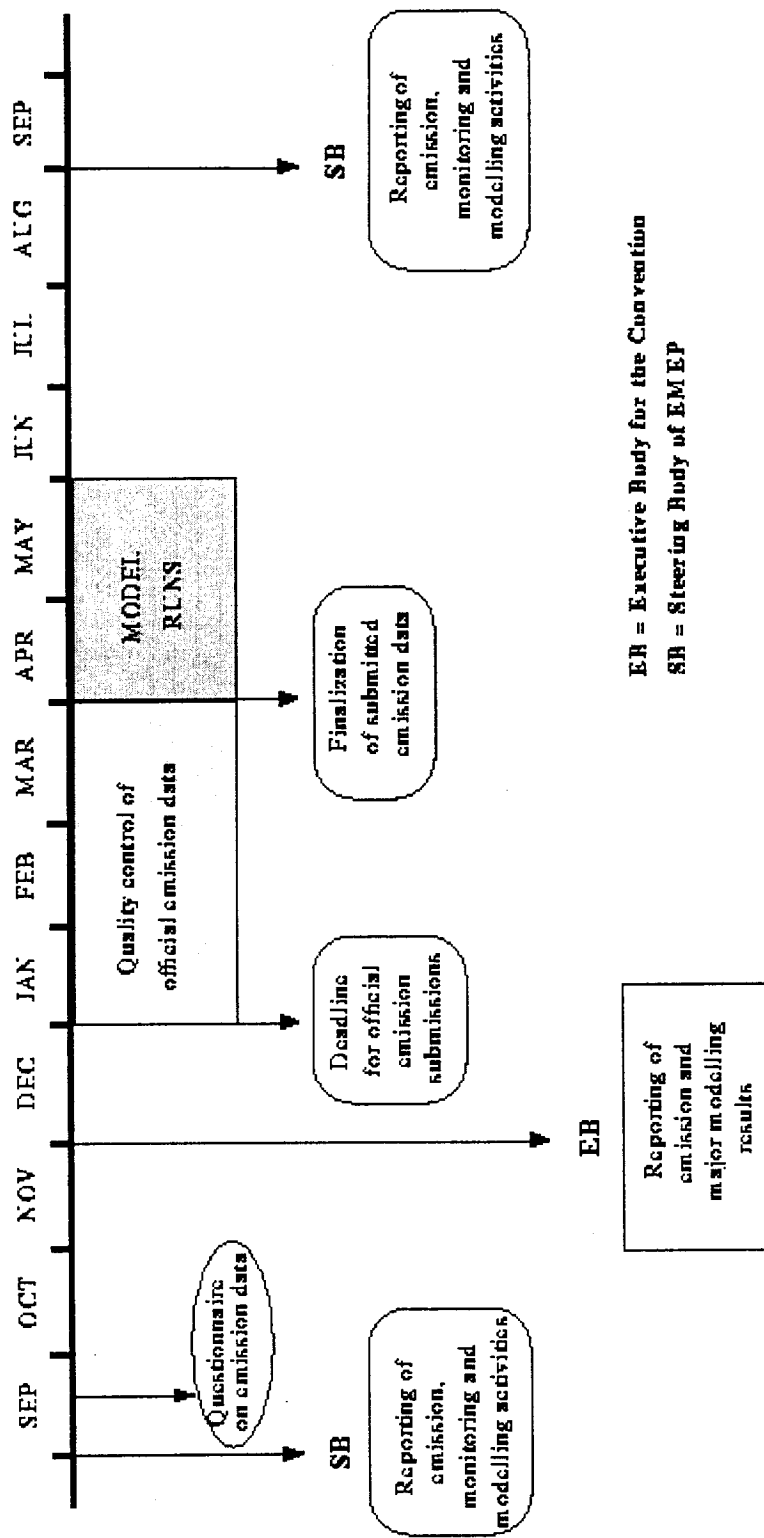


Figure 1. Timing of emission and modelling activities under the Convention on Long-range Transboundary Air Pollution

Table 8. Reporting of national emission totals

	Number of annual totals 1980-1997 (max=18)							Latest year reported
	SO ₂	NO _x	NH ₃	NMVOC	CO	CH ₄	CO ₂	SO ₂ /NO _x /NH ₃ /NMVOC/CO/CH ₄ /CO ₂
Armenia	17	17	17	17	13	1	1	1997/97/97/97/97/90/90
Austria	18	18	18	18	18	18	16	1997/97/97/97/97/97/95
Belarus	18	18	5	18	13	2	3	1997/97/97/97/97/95/95
Belgium	18	14	9	9	8	8	7	1997/97/97/97/97/97/96
Bosnia and Herzegovina	1	-	-	-	-	-	-	1990/-/-/-/-/-/-/-
Bulgaria	12	11	8	9	11	11	4	1997/97/97/97/97/97/94
Canada	17	17	-	12	8	16	16	1996/96/-/95/95/95/95
Croatia	9	8	8	8	8	8	8	1997/97/97/97/97/97/97
Cyprus	13	13	-	-	-	-	14	1997/97/-/-/-/-/-/97
Czech Republic	18	18	8	9	16	8	14	1997/97/97/97/97/97/97
Denmark	18	18	18	18	18	18	18	1997/97/97/97/97/97/97
Finland	18	18	4	7	8	7	18	1997/97/97/97/97/97/97
France	17	17	7	7	17	7	17	1996/96/96/96/96/96/96
Georgia	-	-	-	-	-	-	-	-/-/-/-/-/-/-/-/-
Germany	18	18	18	18	18	18	18	1997/97/97/97/97/97/97
Greece	9	8	1	8	7	7	13	1996/96/94/96/96/96/96
Hungary	18	18	10	14	10	8	18	1997/97/97/97/97/97/97
Iceland	18	18	-	18	18	18	18	1997/97/-/97/97/97/97
Ireland	18	18	8	8	8	8	7	1997/97/97/97/97/97/96
Italy	16	16	16	16	16	16	16	1995/95/95/95/95/95/95
Latvia	7	7	6	7	7	7	7	1996/96/95/96/96/96/96
Liechtenstein	15	15	3	15	15	3	15	1994/94/90/94/94/90/94
Lithuania	18	18	18	18	18	18	18	1997/97/97/97/97/97/97
Luxembourg	7	7	4	5	5	4	5	1996/96/96/96/96/96/96
Malta	-	-	-	-	-	-	-	-/-/-/-/-/-/-/-/-
Netherlands	18	18	18	9	9	18	10	1997/97/97/97/97/97/97
Norway	18	18	18	18	18	18	18	1997/97/97/97/97/97/97
Poland	14	14	14	18	7	7	10	1997/97/97/97/97/97/97
Portugal	8	7	6	7	6	6	6	1995/95/95/95/95/95/95
Republic of Moldova	17	17	6	7	17	-	-	1997/97/97/97/97/-/-
Romania	15	15	15	15	15	15	15	1994/94/94/94/94/94/94
Russian Federation	18	18	18	18	18	18	18	1997/97/97/97/97/97/97
Slovakia	14	10	6	5	9	8	9	1997/97/97/96/97/97/97
Slovenia	18	18	3	4	18	4	18	1997/97/95/95/97/95/97
Spain	16	16	16	16	16	16	16	1995/95/95/95/95/95/95
Sweden	18	18	9	4	8	8	18	1997/97/97/97/97/97/97
Switzerland	15	15	6	11	10	6	1	1997/97/97/97/97/97/90
The FYR of Macedonia	1*	1*	-	-	1*	-	-	1997/97/-/-/-/97/-/-
Turkey	4	15	-	-	-	-	15	1986/95/-/-/-/-/95
Ukraine	18	18	-	13	13	-	-	1997/97/-/97/97/-/-
United Kingdom	18	18	3	18	18	18	8	1997/97/97/97/97/97/97
United States	17	17	2	17	17	1	1	1996/96/90/96/96/90/90
Yugoslavia *	18	18	-	-	-	-	-	1997/97/-/-/-/-/-/-
European Community	-	-	-	-	-	-	9	-/-/-/-/-/-/-/89

* Incomplete reporting

Table 9. Reporting of national emission projections

	Emission projection years reported						
	2000 2005 2010						
	x x x						
	SO ₂	NO _x	NH ₃	NM VOC	CO	CH ₄	CO ₂
Armenia	---	---	---	---	---	---	---
Austria	x--	xxx	---	xxx	---	---	x-x
Belarus	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Belgium	xxx	---	---	---	---	---	---
Bosnia and Herzegovina	---	---	---	---	---	---	---
Bulgaria	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Canada	xxx	xxx	---	xxx	xxx	x--	x--
Croatia	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Cyprus	xxx	xxx	---	---	---	---	xxx
Czech Republic	xxx	xxx	---	---	---	---	xxx
Denmark	xx-	xx-	x--	x--	xx-	xx-	xx-
Finland	x--	xxx	xxx	x--	---	---	---
France	xxx	---	---	---	---	---	---
Georgia	---	---	---	---	---	---	---
Germany	xxx	-xx	---	-x-	-x-	xxx	xx-
Greece	xxx	---	---	---	---	---	---
Hungary	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Iceland	xxx	xxx	---	xxx	xxx	xxx	xxx
Ireland	xxx	xxx	xxx	xxx	xxx	x--	x--
Italy	xxx	xxx	xxx	xxx	xxx	---	?--
Latvia	xxx	xxx	---	xxx	xxx	xxx	xxx
Liechtenstein	xx-	xx-	xx-	xx-	xx-	xx-	xx-
Lithuania	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Luxembourg	x--	x--	x--	x--	x--	x--	x--
Malta	---	---	---	---	---	---	---
Netherlands	x-x	-xx	-xx	x-x	---	x--	x--
Norway	x--	x--	---	x--	---	---	---
Poland	---	--x	---	x-x	---	---	---
Portugal	xx-	---	---	---	---	---	x--
Romania	---	---	---	---	---	---	---
Republic of Moldova	xxx	xxx	xxx	xxx	xxx	---	---
Russian Federation	xxx	---	---	---	---	---	x-x
Slovakia	xxx	---	---	---	---	---	---
Slovenia	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Spain	x--	x--	---	---	---	---	x--
Sweden	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Switzerland	xxx	xxx	xxx	xxx	xxx	xxx	x--
The FYR of Macedonia	---	---	---	---	---	---	---
Turkey	---	xxx	---	---	---	---	xxx
Ukraine	xxx	xxx	---	xxx	xxx	---	---
United Kingdom	xxx	xxx	---	xxx	xxx	xxx	xxx
United States	xxx	xxx	---	xxx	xxx	---	---
Yugoslavia	xxx	xxx	---	---	---	---	---
European Community	---	---	---	---	---	---	x--

Table 10. Reporting of national emission source category split (11 categories)

	Number of years 1980-1997 (max=18)						Latest year reported
	SO ₂	NO _x	NH ₃	NM VOC	CO	CH ₄	SO ₂ /NO _x /NH ₃ /NM VOC/CO/CH ₄
Armenia	17	17	17	17	13	1	1997/97/97/97/97/90
Austria	18	18	18	18	18	18	1997/97/97/97/97/97
Belarus	-	-	-	-	-	-	- / - / - / - / - / -
Belgium	9	9	9	9a	8	8	1997/97/97/97/97/97
Bosnia and Herzegovina	-	-	-	-	-	-	- / - / - / - / - / -
Bulgaria	9*	8*	8*	9*	8*	8*	1997/97/97/97/97/97
Canada	7*	7*	-	7*	7*	6*	1995/95 / - /95/95/94
Croatia	8	8	8	8	8	8	1997/97/97/97/97/97
Cyprus	9*	9*	-	-	-	-	1997/97 / - / - / - / -
Czech Republic	8	8	8	8	8	8	1997/97/97/97/97/97
Denmark	9*	9*	8*	9*	9*	9*	1997/97/97/97/97/97
Finland**	4	4	4	4	4	4	1997/97/97/97/97/97
France	7	7	7	7	7	7	1996/96/96/96/96/96
Georgia	-	-	-	-	-	-	- / - / - / - / - / -
Germany**	9	9	9	9	9	9	1996/96/96/96/96/96
Greece	2	2	-	2	1	1	1996/96 / - /96/96/96
Hungary	9	9	3	7	7	2	1997/97/97/97/97/97
Iceland	8*	8*	-	8*	8*	8*	1997/97 / - /97/97/97
Ireland**	8	8	5	8	6	6	1997/97/97/97/97/97
Italy	16	16	16	16	16	16	1995/95/95/95/95/95
Latvia	7	7	6	7	7	7	1996/96/96/96/96/96
Liechtenstein	6*	6*	-	6*	6*	6*	1994/94 / - /94/94/94
Lithuania	3	3	3	3	3	3	1997/97/97/97/97/97
Luxembourg	6*	6*	5*	6*	6*	5*	1996/96/96/96/96/96
Malta	-	-	-	-	-	-	- / - / - / - / - / -
Netherlands	9*	9*	9*	9*	9*	9*	1997/97/97/97/97/97
Norway	10*	10*	10*	10*	10*	10*	1997/97/97/97/97/97
Poland	9	9	8	18	5	7	1997/97/97/97/97/97
Portugal	6	6	6	6	6	6	1997/97/97/97/97/97
Republic of Moldova	-	-	-	-	-	-	- / - / - / - / - / -
Romania	6	6	6	6	6	6	1994/94/94/94/94/94
Russian Federation ^b	9	8	9	9	9	9	1997/97/97/97/97/97
Slovakia	6	6	6	5	6	6**	1997/97/97/97/97/97
Slovenia	9	9	3	3	9	3	1997/97/95/95/97/95
Spain	16	16	16	16	16	16	1995/95/95/95/95/95
Sweden	8*	8*	8*	8*	8*	8*	1997/97/97/97/97/97
Switzerland	8	8	8	8	8	8	1997/97/97/97/97/97
The FYR of Macedonia ^b	1	1	-	-	1	-	1997/97 / - / - /97 / -
Turkey	-	-	-	-	-	-	- / - / - / - / - / -
Ukraine ^b	8*	8*	8*	8*	8*	-	1997/97/97/97/97 / -
United Kingdom	18*	18*	5	18*	18*	18	1997/97/97/97/97/97
United States ^d	8*	8*	-	8*	8*	-	1996/96 / - /96/96 / -
Yugoslavia ^b	8*	8*	-	-	-	-	1997/97 / - / - / - / -
European Community	-	-	-	-	-	-	- / - / - / - / - / -

* Source category split has also been reported for 2000. Canada, Cyprus and Sweden reported for 2005 and 2010 as well.

** Provisional data for the latest reported year.

a The NMVOC figure for 1985 includes CH₄ emissions.

b Incomplete reporting.

d Reported figures for 1995 are drawn from the EPA report: EPA-4544/R-96-007 (1996).

Table 11. National gridded distributions reported for at least one year

	Grid size: 150 km x 150 km						Grid size: 50 km x 50 km						Low & High
	SO ₂	NO _x	NH ₃	NM VOC	CO	CH ₄	SO ₂	NO _x	NH ₃	NM VOC	CO	CH ₄	
Armenia							x	x	x	x	x		Yes
Austria							x	x	x	x	x	x	Yes, LPS
Belarus	x	x	x	x	x								
Belgium	x	x					x	x	x	x	x	x	Yes
Bosnia and Herzegovina							x						
Bulgaria	x						x	x	x	x	x	x	Yes, LPS
Canada													
Croatia	x	x					x	x	x	x	x	x	LPS
Cyprus							x	x					LPS
Czech Republic							x	x	x	x	x	x	
Denmark	x	x											Yes
Finland	x	x					x	x	x	x	x		Yes
France	x	x					x	x	x	x		x	Yes
Georgia													
Germany	x	x											
Greece													
Hungary	x	x					x	x			x		Yes, LPS
Iceland													
Ireland	x						x	x	x	x	x	x	LPS
Italy	x ^a	x ^a		x ^a	x ^a		x	x	x	x	x	x	
Latvia							x	x	x	x			
Liechtenstein													
Lithuania													
Luxembourg													
Malta													
Netherlands	x	x					x	x	x	x	x	x	Yes, LPS
Norway	x	x	x	x			x	x	x	x	x	x	Yes
Poland	x	x					x	x	x	x	x	x	Yes
Portugal	x	x					x	x	x	x	x	x	Yes
Republic of Moldova													
Romania													
Russian Federation	x	x		x			x	x	x	x	x		Yes
Slovakia							x	x		x	x		Yes
Slovenia	x						x	x	x	x	x	x	LPS
Spain	x	x					x	x	x	x	x	x	Yes
Sweden	x	x					x	x					Yes
Switzerland	x	x	x	x	x	x	x	x	x	x	x	x	Yes
The FYR of Macedonia													
Turkey													
Ukraine	x	x	x ^a	x									Yes
United Kingdom	x	x		x			x	x		x	x		Yes, LPS
United States													
Yugoslavia	x ^a	x ^a					x	x					
European Community													

'Low & High' refers to the height separation of emissions (below and above 100 m).

'LPS' = Large Point Sources.

a Incomplete reporting.

Table 12. Emissions of sulphur (1980-2010) in the ECE region as a percentage of 1980 levels

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000	2005	2010
Armenia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	100	87	82	62	55	49	44	40	29	26	23	21	16	15	14	13	13	14	15	-	-
Belarus	100	99	96	96	93	93	93	103	97	90	86	88	62	52	44	37	33	28	75	66	65
Belgium	100	86	84	68	60	48	46	44	43	39	40	40	38	36	31	30	29	26	30	28	26
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	100	-	-	-	-	-	-	118	109	106	99	82	55	70	72	73	69	67	67	60	55
Canada	100	92	78	78	85	80	78	81	83	80	70	70	67	65	57	58	59	-	61	63	63
Croatia	100	-	-	-	-	-	-	-	-	-	120	72	71	76	59	45	48	53	89	83	78
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	100	104	106	104	102	101	96	96	92	89	83	79	68	63	56	48	42	31	20	19	17
Denmark	100	80	82	70	66	75	63	56	54	42	40	54	42	35	34	33	41	24	20	20	-
Finland	100	91	83	64	63	65	57	56	52	42	45	33	24	21	19	16	18	17	20	-	-
France	100	78	75	63	56	44	40	39	37	40	37	41	36	32	30	29	28	-	26	23	22
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	100	99	99	98	102	103	102	98	86	82	71	53	44	39	33	28	21	20	17	13	7
Greece	100	-	-	-	-	125	-	-	-	-	127	138	139	138	135	138	136	-	149	145	143
Hungary	100	97	95	91	88	86	83	79	75	67	62	56	51	47	45	43	41	40	55	50	40
Iceland	100	100	100	100	106	100	100	89	100	94	133	128	133	139	133	133	133	139	161	161	167
Ireland	100	86	71	64	64	63	73	78	68	73	80	81	73	71	80	73	66	74	70	70	70
Italy	100	89	76	66	56	51	51	54	52	49	44	41	37	35	34	35	-	-	27	23	22
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	100	95	87	82	74	69	64	56	51	44	38	38	36	36	33	-	-	-	28	28	-
Lithuania	100	100	98	100	97	98	102	102	96	96	71	75	45	40	38	30	30	25	53	50	47
Luxembourg	100	-	-	58	-	71	-	-	-	-	63	-	-	-	54	38	33	-	17	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	100	95	82	66	61	53	54	54	51	42	41	35	35	33	30	30	28	25	19	-	20
Norway	100	93	81	76	70	72	66	53	50	42	39	32	26	26	25	25	24	22	25	-	-
Poland	100	-	-	-	-	105	102	102	102	95	78	73	69	66	64	58	58	53	-	-	-
Portugal	100	-	-	-	-	74	-	-	-	-	136	132	158	134	126	140	-	-	114	111	-
Republic of Moldova	100	99	93	92	88	92	96	103	89	77	75	60	41	12	7	9	6	6	45	42	42
Romania	100	104	105	116	116	119	123	124	139	144	124	99	90	88	86	-	-	-	-	-	-
Russian Federation	100	97	99	97	91	86	80	79	72	65	62	61	54	48	42	40	37	34	62	60	60
Slovakia	100	-	-	-	-	79	77	79	79	76	73	70	57	49	42	31	29	26	27	27	27
Slovenia	100	109	109	117	107	103	106	95	90	91	83	77	81	78	76	51	47	51	39	19	16
Spain	100	98	96	96	88	84	80	76	66	76	74	72	71	67	67	63	-	-	70	-	-
Sweden	100	88	76	62	60	54	55	46	46	33	24	20	18	18	17	16	17	14	15	14	14
Switzerland	100	-	-	-	72	66	59	53	48	42	37	35	33	29	27	29	26	22	22	22	23
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	100	-	-	-	32	37	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	100	91	89	91	90	90	88	85	83	80	72	66	62	57	45	43	34	29	60	60	60
United Kingdom	100	91	86	79	76	77	80	80	78	76	77	73	71	65	55	48	41	34	27	21	17
United States	100	95	89	87	91	90	87	86	88	88	89	87	86	84	82	72	74	-	66	69	69
Yugoslavia	100	100	101	108	112	118	116	119	124	125	125	110	98	99	104	114	107	129	167	219	280
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

See footnotes to table 1.

Table 13. Emissions of nitrogen oxides (1980-2010) in the ECE region as a percentage of 1987 levels

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000	2005	2010
Armenia	-	29	33	33	31	87	102	100	108	98	88	77	42	23	23	29	21	29	-	-	-
Austria	108	105	104	103	102	103	102	100	95	92	91	93	88	83	86	80	77	81	72	72	72
Belarus	89	89	89	90	91	90	98	100	100	100	108	107	85	79	77	74	66	72	83	70	68
Belgium	131	-	-	-	-	96	94	100	102	106	96	99	101	101	101	99	96	92	-	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	-	-	-	-	-	-	-	100	100	99	90	64	57	58	55	64	62	54	91	84	70
Canada	92	89	89	88	88	96	96	100	103	103	99	94	94	94	95	95	94	-	97	97	98
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	100	100	100	113	119	125	106	125	131	131	131	131	144	131	144	144
Czech Republic	115	100	100	102	103	102	101	100	105	113	91	89	86	70	53	50	53	46	46	44	43
Denmark	90	79	86	84	88	96	103	100	97	90	90	103	88	88	87	80	92	79	65	62	-
Finland	102	96	94	91	89	95	96	100	102	105	104	101	98	98	98	90	93	90	78	78	78
France	112	104	104	101	100	99	99	100	99	109	115	119	115	109	107	106	104	-	-	-	-
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	105	103	101	103	104	103	103	100	96	91	85	79	73	68	64	61	59	57	-	67	40
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	103	102	101	100	100	99	100	100	97	93	90	77	69	69	71	72	74	75	87	79	74
Iceland	88	88	88	92	92	88	92	100	104	104	108	113	117	121	121	117	125	121	117	121	125
Ireland	63	75	75	74	73	79	87	100	106	110	100	103	109	106	102	100	105	108	91	91	91
Italy	90	89	89	87	88	89	93	100	102	106	107	110	111	110	99	98	-	-	89	83	79
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	109	109	108	106	105	103	102	100	100	98	97	94	89	86	83	-	-	-	63	57	-
Lithuania	89	90	91	92	95	97	99	100	101	101	92	97	57	46	45	38	38	33	64	64	64
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	97	96	94	93	96	98	98	100	101	97	97	95	93	89	85	83	84	78	-	42	55
Norway	84	79	80	83	89	93	100	100	98	98	97	92	92	96	94	94	98	99	70	-	-
Poland	80	-	-	-	-	98	99	100	101	97	84	79	74	73	72	73	75	73	-	-	57
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Moldova	82	80	70	59	62	94	101	100	104	99	89	94	55	21	25	34	15	42	42	49	48
Romania	90	91	89	93	94	93	96	100	102	100	94	80	62	55	55	-	-	-	-	-	-
Russian Federation	65	72	75	74	71	72	71	100	89	96	136	125	117	115	101	97	93	90	-	-	-
Slovakia	-	-	-	-	-	-	-	100	-	115	114	108	96	93	88	92	66	62	-	-	-
Slovenia	89	91	91	89	91	93	102	100	104	102	109	95	96	107	116	118	123	125	79	67	54
Spain	103	96	96	97	96	93	96	100	103	113	115	120	122	120	121	122	-	-	87	-	-
Sweden	92	95	94	92	94	97	99	100	99	96	77	78	75	74	76	69	69	64	62	48	46
Switzerland	98	-	-	-	102	103	102	100	99	98	95	92	88	83	80	78	75	72	67	63	65
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	65	65	70	74	79	85	93	100	97	109	117	120	126	132	-	162	-	-	224	288	392
Ukraine	105	105	105	105	101	97	102	100	100	97	100	90	76	64	52	49	43	42	100	100	100
United Kingdom	96	92	91	92	90	93	96	100	102	104	103	99	96	90	86	80	78	71	59	49	44
United States	109	108	105	105	109	103	102	100	108	105	104	104	106	107	109	105	103	-	95	93	93
Yugoslavia	78	83	83	88	97	97	97	100	105	103	110	95	82	90	87	98	95	110	147	192	245
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

See footnotes to table 2.

Table 14. Emissions of non-methane volatile organic compounds (1980-2010) in the ECE region as a percentage of 1988 levels

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000	2005	2010
Armenia	-	28	26	26	24	100	105	112	100	97	87	75	33	22	18	25	19	38	-	-	-
Austria	94	93	93	94	96	95	99	99	100	97	93	85	78	75	72	71	69	67	70	70	70
Belarus	103	102	101	101	101	96	95	95	100	96	100	102	77	70	68	69	61	64	71	60	60
Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	-	-	-	-	-	-	-	-	100	-	70	58	58	67	57	56	48	39	79	64	62
Canada	71	-	-	-	-	96	96	98	100	98	97	94	92	93	93	93	-	-	91	94	99
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	96	94	94	96	98	99	100	100	100	97	84	87	84	80	79	76	64	65	64	-	-
Finland	-	-	-	-	-	-	-	99	100	-	98	-	-	92	-	87	81	82	70	-	-
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	101	99	98	99	100	100	101	101	100	99	100	87	80	72	68	62	59	57	-	35	-
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	100	-	-	-	-	108	122	106	100	95	95	70	66	69	66	70	70	67	84	74	67
Iceland	62	62	62	62	62	62	62	92	100	100	100	108	108	108	108	92	92	77	62	54	54
Ireland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	103	100	98	96	94	94	95	98	100	104	104	108	110	110	111	111	-	-	84	73	68
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	96	97	97	97	98	99	99	99	100	101	101	97	93	88	84	-	-	-	60	56	-
Lithuania	92	94	95	96	97	99	99	99	100	100	94	97	55	42	42	69	72	72	79	77	77
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	73	74	77	82	87	94	102	104	100	115	125	125	133	140	144	149	148	145	79	-	-
Poland	101	89	87	93	96	99	100	99	100	99	81	81	78	74	80	75	75	75	79	-	93
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Moldova	-	-	-	-	-	-	-	100	100	94	136	75	39	25	24	42	18	39	49	69	69
Romania	98	95	89	93	95	91	98	106	100	95	89	76	72	73	73	-	-	-	-	-	-
Russian Federation	102	102	93	88	86	89	84	101	100	133	128	117	115	107	103	90	92	84	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovenia	-	-	-	-	-	-	-	-	100	-	108	-	-	-	108	108	-	-	85	77	64
Spain	89	88	88	90	88	89	92	97	100	105	108	114	115	113	114	111	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	100	-	95	-	-	-	-	-	80	75	67	53	52
Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The FYR of Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	101	103	105	100	94	85	81	73	61	64	51	45	41	85	85	85
United Kingdom	90	89	91	92	94	94	95	97	100	102	100	98	94	90	87	83	80	76	59	52	53
United States	108	102	97	102	106	100	97	96	100	93	87	87	86	86	89	85	79	-	67	62	61
Yugostavia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
European Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

See footnotes to table 4.

Table 15. Status of reporting on heavy metals (HMs): Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn

	Year(s)	metals	SNAP-I source split	remarks
Armenia	83-97	Pb		gridded (97)
	83-85, 89-96	Hg		
	83-85, 87-89, 96	As		
	87, 89-97	Cr		gridded (97)
	85-97	Cu		gridded (97)
	87-97	Ni		gridded (97)
	88, 96	Zn		
Austria	90, 95 94	Pb, Cd, Hg As, Cr, Cu, Ni, Se, Zn		
Belarus	90, 95	all except Se	non-SNAP	
	97	all except Se	YES	gridded
Belgium *	90-97	all		
Bulgaria	90, 95	Pb, Cd, Hg	YES	gridded, LPS
	96, 97	Pb, Cd, Hg		
Croatia	90	all		
	95, 96	Pb, Cd, Hg	YES	gridded
	97	all	YES	gridded
Cyprus	90	all except Se		
	90-97	Pb		
Czech Republic	90	Pb, Cd, Hg		
Denmark	94, 96	all	YES	
	95	Pb, Cd, Hg	YES	
	97	all		
Finland	90-97	all except Se		
France	90-96	all	YES	
Germany	85, 90	all + 11 others	YES (Pb, Cd, Hg)	
	95	all + 11 others		
	2010	Pb, Cd, Hg		
Greece	96	all		
Hungary	85, 90-97	all		
Iceland	90-97	Pb		
Italy	90, 94	Pb, Cd, Hg		
Latvia	90-95	all except Se		
Lithuania	90-97	all except Se		
Luxembourg	94-96	Pb, Cd, Hg		
Netherlands	90, 92, 94-97	all	YES (90, 94-97)	gridded (95)
	91, 93	all except As and Se		
Norway	80, 87, 90-98	Pb	YES	gridded (96)
	90-98	Cd	YES (91-98)	gridded (96)
	94-96	Hg, As, Cr, Cu, Ni, Zn		
Poland	90-96	all except Se	YES (95)	gridded (95)
	96, 97	Pb, Cd, Hg	YES	
Rep. of Moldova	90-97	Pb, Cr, Ni		
	90-95	Cu		
Russian Federation	90-97	Pb, Cd, Hg		gridded (90, 95)
Slovakia	90, 92, 94-97	all		
Slovenia	90-97	Pb		
	90, 94, 95	Cd, Hg		
Spain	90	all		
Sweden	90, 92, 94, 95	all except Se		
Switzerland	80, 85, 90-97	Pb, Cd, Hg, Zn	YES (90, 95)	
Ukraine	95	total for all		gridded,* total for all
United Kingdom	85, 90-97, 2010	Pb, Cd, Hg		
United States	90	all except Cu and Zn	non-SNAP (Pb, Cd, Hg)	
	91-96	Pb		

* Figures for 1990 refer to Flanders and Wallonia only. Figures for 1991-1993 are totals for Flanders only.

Table 16. Status of reporting on persistent organic pollutants (POPs).

	Year(s)	compound	SNAP-1 source split	remarks
Austria	94-97	D&F, PAHs, HCH		data on HCH use
Belgium	90	HCB, PCP*, D&F*, PAHs*		
	93	PAHs*		
	94	D&F*, PAHs*, HCB*, PCP*		
	95	HCB, D&F, PAHs, PCP*		
	96	D&F, PAHs, HCB*, PCP*		
Bulgaria	90	D&F, HCB, PAHs, PCP, PCB	YES	gridded, LPS gridded (except PCP), LPS data on use and production for 90-96
	95	D&F, HCB, PAHs, PCP, PCB	YES	
	96	D&F, HCB, PAHs, PCP, PCB		
	97	D&F, HCB, PAHs, PCP, PCB		
Croatia	90	D&F, HCB, HCH, PCP, SCCP		
	96	D&F, HCB, PAHs, HCH, PCP, SCCP	YES	
	97	D&F, HCB, PAHs, HCH, SCCP	YES	
Cyprus	90	D&F, PCP		data on HCH use in 1997
Denmark	94	D&F, HCH and 10 others	YES	data on use and production
	97	D&F, PAHs		
Finland	93-95	PCBs		data on use and production for 90-95
	95	D&F, PAHs		
France	90	PCP, HCB	YES	
	90-96	PCB, D&F, PAHs, SCCP	YES	
Germany	90	D&F, HCB, PCB, PAHs, Pesticides (total) and 4 others		
	95	D&F		
Hungary	85, 90-97	D&F, PAHs, HCB, HCH, PCB		data on use and production for 90-96
	90-96	PCP		
Iceland	90-95	Pesticides, PCP, PCBs, D&F, PAHs		data on use and production
Lithuania	97	D&F, PAHs, PCB		
Luxembourg	94-96	D&F, PAHs		
Netherlands	90-95	Pesticides, Hexabromobiphenyl		gridded for 95 data on use and production for 90-94
	92	D&F, PAHs, PCP, PCB	YES	
	90, 94-97	D&F, HCB, HCH, PCP, PAHs and 5 others	YES	
Norway	95, 96	D&F, PAHs, HCB, PCP	YES	Area emissions, LPS
	90, 95	D&F, PAHs, PCB	YES	data on use and production, gridded for 95
96, 97	D&F, PAHs, PCB	YES		
Rep. of Moldova	92-97	PAHs		
Russian Federation	90	D&F, PAHs, HCH		
	91-97	PAHs		
Slovakia	90, 95, 97	D&F, PAHs, PCB		
Spain	90	D&F, PCP, HCB		data on use and production
Sweden	90, 93	D&F		
	90, 92, 95	PAHs		
Switzerland	90-97	D&F		
United Kingdom	90-97	D&F, PCP, PCB, HCH, HCB		data on use and production
	90-96	PAHs		
United States	90	D&F	non-SNAP	
	90	HCB, PAHs, PCP, PCBs		

* Figures refer to specific national regions only.

- ANNEX I: aldrin, chlordane, chlordecone, dieldrin, endrin, heptachlor, hexabromobiphenyl, mirex, toxaphene.
ANNEX II: Hexachlorocyclohexane (HCH), DDT, polychlorinated biphenyls (PCBs).
ANNEX III: dioxins & furans (D&F), polyaromatic hydrocarbons (PAHs), hexachlorobenzene (HCB).
OTHERS: pentachlorophenol (PCP), Short-chain chlorinated paraffins (SCCP).

Table 17. Anthropogenic emissions of heavy metals (1990-1996) in the ECE region (tonnes per year)

	Year(s)	PRIORITY METALS			OTHER METALS					
		Lead	Cadmium	Mercury	Arsenic	Chromium	Copper	Nickel	Selenium	Zinc
Armenia	1983	91.0		0.01	30.0					
	1984	61.0		0.01	95.0					
	1985	44.0		0.01	62.0		5.0			
	1986	87.0					5.0			
	1987	46.0			62.0	0.2	5.0	0.3		
	1988	57.0			66.0		5.0	0.003		0.1
	1989	22.0		0.03	22.0	5.0	2.0	0.1		
	1990	11.0		0.01		4.0	2.5	0.1		
	1991	0.82		0.01		5.97	1.6	0.24		
	1992	0.61		0.008		1.8	0.068	0.239		
	1993	0.79		0.009		1.04	0.036	0.074		
	1994	0.34		0.001		0.34	0.002	0.003		
	1995	0.334		0.001		0.101	0.001	0.009		
	1996	0.009		0.0008	0.0003	0.466	0.009	0.02		0.016
1997	0.009				0.019	0.65	0.003			
Austria	1990	201	3.09	2.65						
	1994				3.3	6.6	9.2	35.5	4.7	208.4
	1995	39.3	1.79	1.48						
Belarus	1990	736.009	6.578	0.092	12.346	27.036	26.488	601.350	-	69.901
	1995	122.462	2.891	0.052	3.857	12.865	12.337	245.952	-	32.034
	1997	42.364	1.244	0.320	3.778	8.507	15.126	161.791	-	158.156
Belgium ^f	1990	601.294	9.515	8.794	10.45	53.984	52.262	106.492	21.354	370.465
	1991	218	3	2	1	12	6	10	0.0	135
	1992	230	4	3	3	11	20	9	0.1	97
	1993	230	1	1	2	22	22	11	3	86
	1994	325.435	4.397	5.824	4.625	26.820	45.691	52.643	23.455	241.593
	1995	336.075	6.379	4.544	6.393	48.316	55.704	46.734	18.802	286.529
	1996	297.309	4.615	5.546	5.214	32.134	32.777	57.662	7.654	219.704
	1997 ^a	285.309	5.615	3.546	4.214	28.134	29.777	48.662	7.654	175.704
Bulgaria	1990	435.85	28.25	13.2						
	1995	297.49	12.82	6.88						
	1996	278.81	14.33	4.70						
	1997	231.24	14.23	4.31						
Croatia	1990	466.028	3.229	1.155	2.627	13.306	17.272	77.199	0.895	91.862
	1995	264.323	1.624	0.287						
	1996	268.492	1.562	0.297						
	1997	190.307	1.621	0.318	1.249	5.187	10.169	32.817	0.405	64.674
Cyprus ⁱ	1990	81	0.2	0.3	0.6	1.6	1.2	1.7		1.8
	1991	63								
	1992	66								
	1993	69								
	1994	68								
	1995	67								
	1996	67								
	1997	72								
Czech Republic ^h	1990	566.7	11.4	5.6						
Denmark ^j	1994	45.632	1.156	8.196	1.333	4.724	14.972	27.464	2.928	56.315
	1995	43.026	1.120	8.485						
	1996	20.121	1.085	2.677	1.270	3.399	10.447	25.396	3.586	36.103
	1997	8.474	847	2.126	839	2.958	8.755	21.098	2.256	25.797
Finland	1990	313.0	6.1	1.8	30.4	22.6	88.5	41.0		558.5
	1991	259.0	2.5	1.7	20.4	37.7	88.2	22.8		374.0
	1992	150.0	2.2	1.3	15.3	29.4	65.0	18.0		280.4
	1993	99.0	3.0	1.3	13.8	19.6	53.6	13.7		257.7
	1994	60.0	2.7	1.6	8.8	18.6	48.2	18.1		313.6
	1995	67.0	2.5	1.7	3.0	21.0	26.2	21.9		318.6
	1996	29	1.0	0.6	6.5	20.1	53.1	14.9		188.9
	1997	12	0.6	0.4	11.8	19.8	71.6	16.6		69.1
France	1990	4622	15.4	43.0	24.1	378	98	275	11.1	1973
	1991	3146	15.8	45.9	23.9	303	101	317	11.6	1766
	1992	2293	15.2	46.8	23.4	248	101	261	11.4	1599
	1993	2043	14.7	44.6	19.6	196	99	234	10.6	1420
	1994	1881	14.3	42.6	21.6	186	102	226	11.1	1389
	1995	1707	13.3	38.4	21.0	162	102	233	11.7	1216
	1996	1511	13.1	37.1	19.8	138	101	232	11.6	1121
Germany ^e	1985	5028.0	45.0	154.0	221.0	344.0	459.0	440.0	115.0	1900.0
	1990	2314.0	30.0	112.0	120.0	252.0	360.0	277.0	28.0	1321.0
	1995	624.0	11.0	30.0	33.0	115.0	79.0	158.0	25.0	452.0
	2010	294.0	11.0	24.0						
Greece ^a	1996	470	3	13	4	10	14	101	0.2	52

	Year(s)	PRIORITY METALS			OTHER METALS					
		Lead	Cadmium	Mercury	Arsenic	Chromium	Copper	Nickel	Selenium	Zinc
Hungary	1985	573.4	6.8	8.6	22.5	22.5	36.3	74.1	4.8	101.1
	1990	695.3	5.6	6.8	16.0	16.5	28.2	42.5	3.4	99.2
	1991	522.8	4.7	6.0	14.5	14.9	23.9	49.0	3.2	71.3
	1992	241.6	4.0	4.9	10.2	11.8	18.3	48.7	2.8	61.5
	1993	217.7	4.1	5.0	10.1	12.2	18.2	57.2	2.9	67.5
	1994	189.6	4.1	4.9	9.7	11.9	16.8	54.1	2.8	47.4
	1995	153.7	3.8	4.3	8.8	10.9	15.7	50.1	2.5	47.9
	1996	126.4	3.4	4.6	8.3	10.0	14.5	42.9	2.3	45.4
Iceland	1997	118.7	3.3	4.5	7.3	9.2	14.7	46.6	2.1	45.0
	1990	12.2								
	1991	8.9								
	1992	6.8								
	1993	5.3								
	1994	4.6								
	1995	3.9								
Italy	1996	1.7								
	1997	0.4								
Italy	1990	4299.8	53.786	19.975						
	1994	2173.8	29.898	13.228						
Latvia	1990	20.3 ^a	2.46	0.37	18.8	11.5	9.9	58.8		22.7
	1991	10.1 ^b	1.79	0.32	7.57	4.81	6.14	46.0		21.7
	1992	7.94 ^c	1.71	0.27	5.47	3.93	5.57	41.7		11.0
	1993	6.18 ^d	1.68	0.22	2.34	3.69	3.43	40.6		9.35
	1994	10.3 ^e	2.20	0.37	2.68	4.71	4.86	56.3		13.3
	1995	4.69 ^f	1.44	0.17	4.45	3.49	2.76	36.7		6.54
Lithuania ^g	1990	46.7	3.8	0.018	3.4	7.4	11.7	95.6		59.1
	1991	48.8	2.8	0.016	2.1	4.6	10.5	57.4		55.2
	1992	32.4	2.5	0.011	2.1	4.6	6.8	59.9		30.0
	1993	28.2	2.3	0.014	2.0	4.4	5.7	57.0		13.2
	1994	33.0	2.1	0.013	1.9	4.3	3.7	57.8		8.9
	1995	30.2	2.1	0.147	1.7	4.4	7.1	52.3		59.8
	1996	17.8	2.3	0.155	1.7	4.6	7.7	54.7		66.3
	1997	19.3	2.0	0.228	1.4	3.6	6.4	44.6		48.4
Luxembourg	1994	52.499	0.532	0.131						
	1995	29.789	0.382	0.089						
	1996	26.232	0.368	0.091						
Netherlands	1990	272.0	2.38	3.0	1.63	12.1	44.9	84.8	0.396	331.0
	1991	251.0	2.33	2.74		11.5	46.9	85.7		325
	1992	233.0	2.33	2.75	1.5	11.3	48.7	96.5	0.4	317.0
	1993	213.0	1.84	2.57		13.8	49.9	90.3		270.0
	1994	164.0	1.68	1.54	1.81	10.4	50.7	95.6	0.3	277.0
	1995	152.0	1.51	1.04	1.38	9.23	50.4	96.9	0.3	270.1
	1996	106.0	1.83	1.04	1.29	7.51	43.4	95.6	0.541	267.0
	1997	72.7	1.82	1.02	1.28	7.34	43.5	90.2	0.541	271
Norway	1980	624.5								
	1987	293.9								
	1990	228	0.9	1.307						
	1991	183	1.2							
	1992	148.7	1.064							
	1993	105.3	1.1							
	1994	20.4	0.6	0.824	0.094	12.010	9.451	40.282		108.086
	1995	14.3	0.6	0.7	0.1	12.1	9.2	37.3		109.2
	1996	7.013	0.6	0.7	0.1	12.0	9.1	37.2		103.7
	1997	6.3	0.6							
Poland	1998	6.4	0.6							
	1990	1371.7	91.6	33.3	82.1	154.6	599.4	370.0	-	3091.5
	1991	1335.6	85.0	32.7	79.8	133.5	530.4	354.8	-	2780.9
	1992	986.0	84.1	31.9	78.9	121.6	497.3	349.8	-	2677.5
	1993	996.9	91.9	32.5	82.4	127.8	511.0	352.9	-	2829.9
	1994	966.1	85.8	32.4	76.2	120.0	478.3	322.5	-	2623.7
	1995	936.6	82.6	32.3	73.4	118.3	464.9	312.3	-	2580.2
	1996	959.7	91.2	33.6	75.6	117.0	494.8	328.3	-	2749.0
	1997	895.8	85.8	33.0	71.0	116.0	475.1	364.9	-	2579.6
	Rep. of Moldova	1990	241	-	-	-	0.942	0.222	0.004	-
1991		196	-	-	-	0.987	0.084	0.005	-	-
1992		106	-	-	-	0.369	0.036	0.015	-	-
1993		63	-	-	-	0.202	0.020	0.005	-	-
1994		48	-	-	-	0.149	0.003	0.001	-	-
1995		77	-	-	-	0.132	0.004	0.004	-	-
1996		40	-	-	-	0.137	-	0.002	-	-
1997	122	-	-	-	0.123	-	0.200	-	-	

	Year(s)	PRIORITY METALS			OTHER METALS					
		Lead	Cadmium	Mercury	Arsenic	Chromium	Copper	Nickel	Selenium	Zinc
Russian Federation	1990	3591	79.4	15.6						
	1991	3553	68.2	13.4						
	1992	3095	68.8	11.4						
	1993	2376	59	11.8						
	1994	2643	56.6	10.4						
	1995	2426	57.4	10.4						
	1996	2304	51	10.1						
	1997	2247	50.4	9.6						
Slovakia	1990	166.1	9.7	12.5	150.3	74.5	103.4	78.0	8.9	110.8
	1992	182	12.0	5.0	96.3	72.1	84.6	52.8	12.9	96.7
	1994	90.5	7.7	3.0	55.0	13.5	55.6	22.5	9.5	79.8
	1995	83.8	11.5	3.9	22.0	14.5	29.6	36.2	7.4	66.6
	1996	97.0	11.0	3.2	92.0	11.0	95.0	41.0	8.4	94.0
	1997	84.3	11.2	3.4	47.2	9.2	64.4	35.3	10.3	73.3
Slovenia	1990	467.4	1.68	0.76						
	1991	386								
	1992	390								
	1993	398								
	1994	412.34	1.66	0.61						
	1995	203.62	1.71	0.65						
	1996	86								
	1997	70								
Spain	1990	4674.0	36.7	20.2	22.24	83.9	1860.0	1771.0	45.97	3419.0
Sweden	1990	540.0	2.0	1.5	6.0	23.0	27.0	26.0	-	230.0
	1992	365.0	1.3	1.2	4.0	20.0	30.0	25.0	-	195.0
	1994	37.0	0.7	0.9	1.1	13.0	9.0	34.0	-	94.0
	1995	37.8	0.8	0.9	1.3	13.8	9.8	32.2	-	138.0
Switzerland ^d	1980	1760	6.35	7.93						1280
	1985	768	4.74	7.84						925
	1990	520.0	4.2	6.8						861.0
	1991	461.0	3.9	6.1						814.0
	1992	401.0	3.6	5.4						767.0
	1993	341.0	3.1	4.7						719.0
	1994	287.0	2.7	4.0						674.0
	1995	226.0	2.5	3.3						629.0
	1996	199.7	2.3	3.1						609.2
	1997	173.9	2.2	2.9						589.6
Ukraine ^e	1995									
United Kingdom ^f	1985	7234	31.8	32.3						
	1990	2847	25.4	30.0						
	1991	2567	24.9	30.9						
	1992	2355	25.7	29.4						
	1993	2136	25.5	23.3						
	1994	1876	24.2	22.6						
	1995	1491	15.0	17.0						
	1996	1324	14.5	13.3						
	1997	1207	15.1	12.5						
	2010	340	12.3	12.3						
United States	1990	4513.012	251	214	1119	1301		1683	228	
	1991	3781.489								
	1992	3455.047								
	1993	3548.322								
	1994	3667.831								
	1995	3577.299								
	1996	3509.854								

a Preliminary data.

b Emissions from gasoline are not included.

c 1985 data are totals for both Germany and former GDR; 1995 data are preliminary.

d Data for arsenic, chromium, copper, nickel and selenium will be communicated within the framework of CORINAIR 94.

e 1995 total for heavy metals is 3225.2 tonnes.

f Figures for 1990 refer to Flanders and Wallonie only. Figures for 1991-1993 are totals for Flanders only.

g Data for 1985 and 2010 are provisional.

h Totals comprise contributions from: combustion processes, industrial processes and transport.

i Figures for 1990 were calculated by TNO.

j Figures for 1997 are based on updated emission factors.

k Figures for 1995-1997 are based on updated national emission factors.

Year(s)	ANNEX I										ANNEX II			ANNEX III			OTHER	
	Aldrin	Chlor- dane	Chlor- decone	Dieldrin	Endrin	Hepta- chlor	Hexabro- nito- biphenyl	Mirex	Toxa- phene	HCH	DDT	PCBs	Dioxins & Furans	PAHs	HCB	PCP	SCCP	
Slovakia																		
1990											161.4	495.9	77.8					
1995											138.9	653.4	30.1					
1997											136.7	464.5	29.4					
1990											-	133.8	-	2387.4	153.7			
1990												58-127	182					
1992												19-46	153					
1993																		
1995												242		0	0			
1990	0	0	0	0	0	0	0	0	0	0	0	230		0	0			
1991	0	0	0	0	0	0	0	0	0	0	0	217		0	0			
1992	0	0	0	0	0	0	0	0	0	0	0	203		0	0			
1993	0	0	0	0	0	0	0	0	0	0	0	192		0	0			
1994	0	0	0	0	0	0	0	0	0	0	0	181		0	0			
1995	0	0	0	0	0	0	0	0	0	0	0	172		0	0			
1996	0	0	0	0	0	0	0	0	0	0	0	161.6		0	0			
1997	0	0	0	0	0	0	0	0	0	0	0	161.6		0	0			
1990	0	?	0	0	0	0	?	0	0	98.6	6975.78	960.0	1072.19	1270000	837170			
1991	0	?	0	0	0	0	?	0	0	85.0	6400.32	943.39	1063.82	1260000	837150			
1992	0	?	0	0	0	0	?	0	0	73.6	5901.37	922.12	983.29	1280000	837150			
1993	0	0	0	0	0	0	?	0	0	64.2	5406.87	884.19	909.79	1260000	587980			
1994	0	0	0	0	0	0	?	0	0	56.4	4845.18	786.87	820.67	1240000	577130			
1995	0	0	0	0	0	0	?	0	0	49.7	4290.48	660.02	764.98	1250000	569390			
1996	0	0	0	0	0	0	?	0	0	44.1	3749.47	412.47	730.24	1240000	561820			
1997	0	?	0	0	0	0	?	0	0	39.4	3247.01	218.13	850000	890000	554520			
1990											143	540	1820	209	5000			

a Preliminary data.

b Referring to: 1) Flanders only; 2) Wallonia only; 3) Figures for Flanders and Wallonia only; 4) Brussels and Wallonia only; 5) Brussels and Flanders only.

c Including source categories: SNAIP 1, 2, 3, 4.

d No emission data on PCP, PCBs, Dioxins and Furans and PAHs for the period 1991-1995; Other compounds are either banned or were never used.

e Unit: tonnes/year. The figures include TRI, PER, and TCE.

f Including TCM, TRI, PER, TCE.

g Including TCM, TRI, PER and trichloroethane.

h Flouranthene (22885 kg); benzo(b)flouranthene (3630 kg); benzo(a)pyrene (2675 kg); benzo(g,h,i)perylene (4326 kg); indeno(1,2,3-c,d)pyrene(2323 kg).

i Also reported for 1990: Pesticides (total, 6 t), tetrachloroethene (11700 t), trichloroethane (30300 t), trichloroethene (11000 t), xylenes (204500 t).

j Restricted use.

k Flouranthene (17173 kg); benzo(b)flouranthene (4096 kg); benzo(k)flouranthene (1506 kg); benzo(a)pyrene (3036 kg); benzo(g,h,i)perylene (4814 kg); indeno(1,2,3-c,d)pyrene(2592 kg).

l There exist only small emissions of PCP and SCCP.

m 6 of Borneff.

n Including PER, TCM, TCE, TRI.

p Figures are calculated by TNO.

q Pesticides other than IIC-B and chlordane (1994 and 1995) are not used in the United Kingdom.

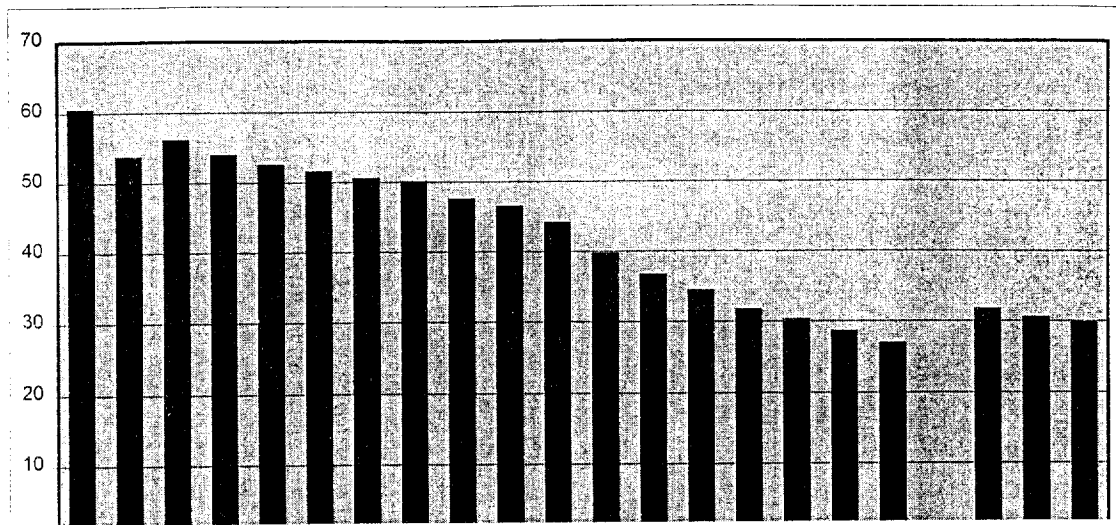


Figure 2. Emissions of sulphur dioxide in the EMEP area (millions of tonnes SO₂)

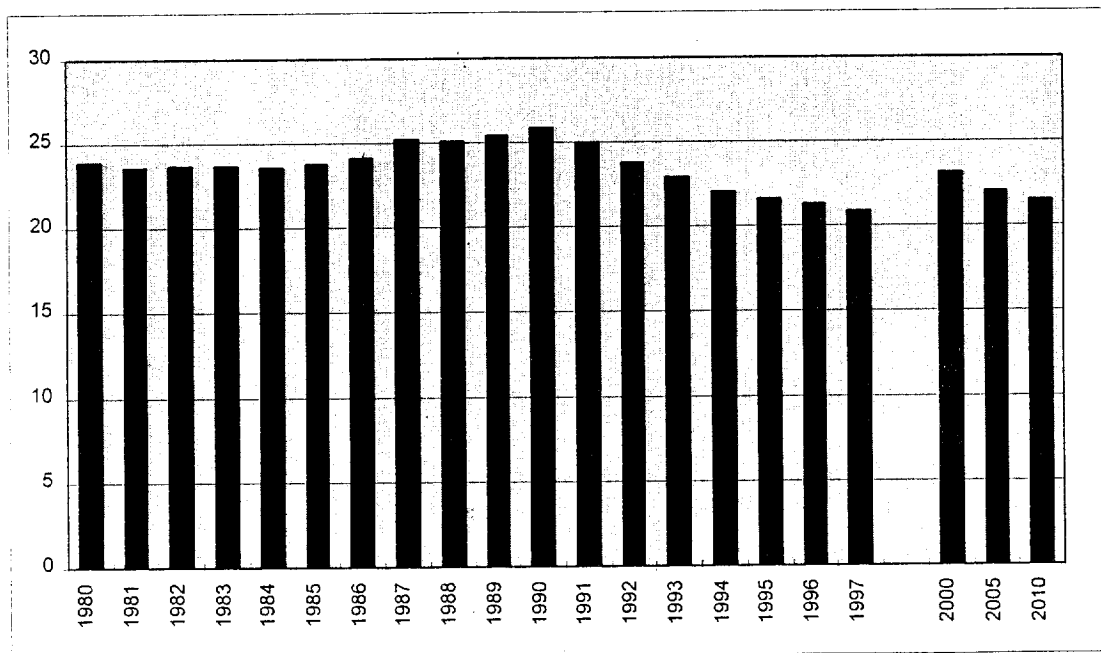


Figure 3. Emissions of nitrogen oxides in the EMEP area (millions of tonnes NO₂)

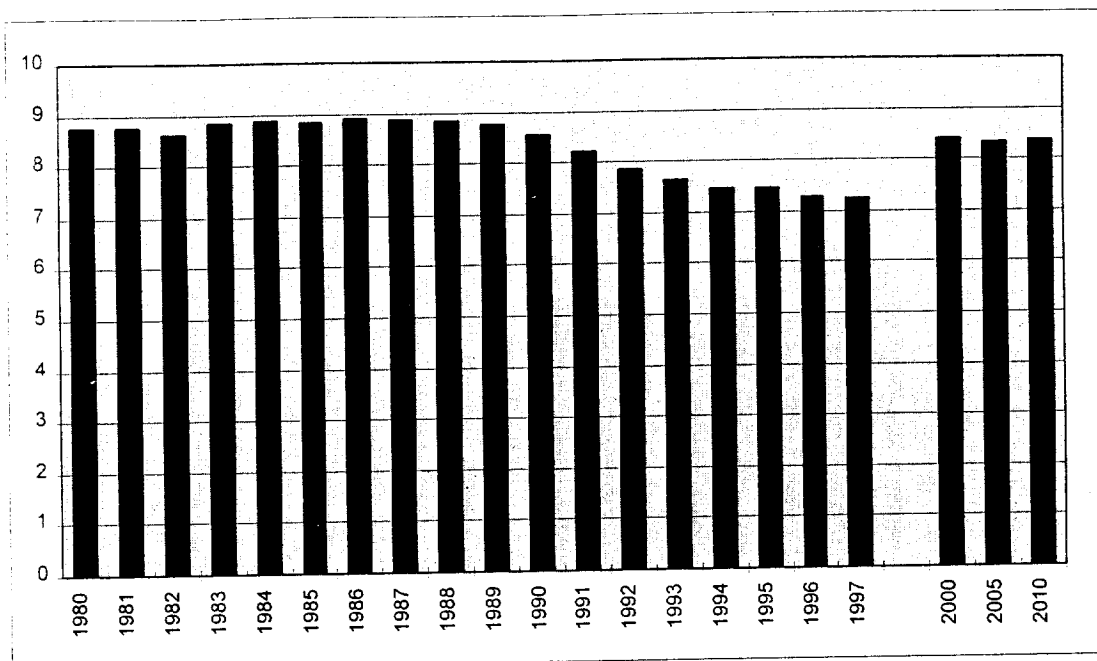


Figure 4. Emissions of ammonia in the EMEP area (millions of tonnes NH₃)

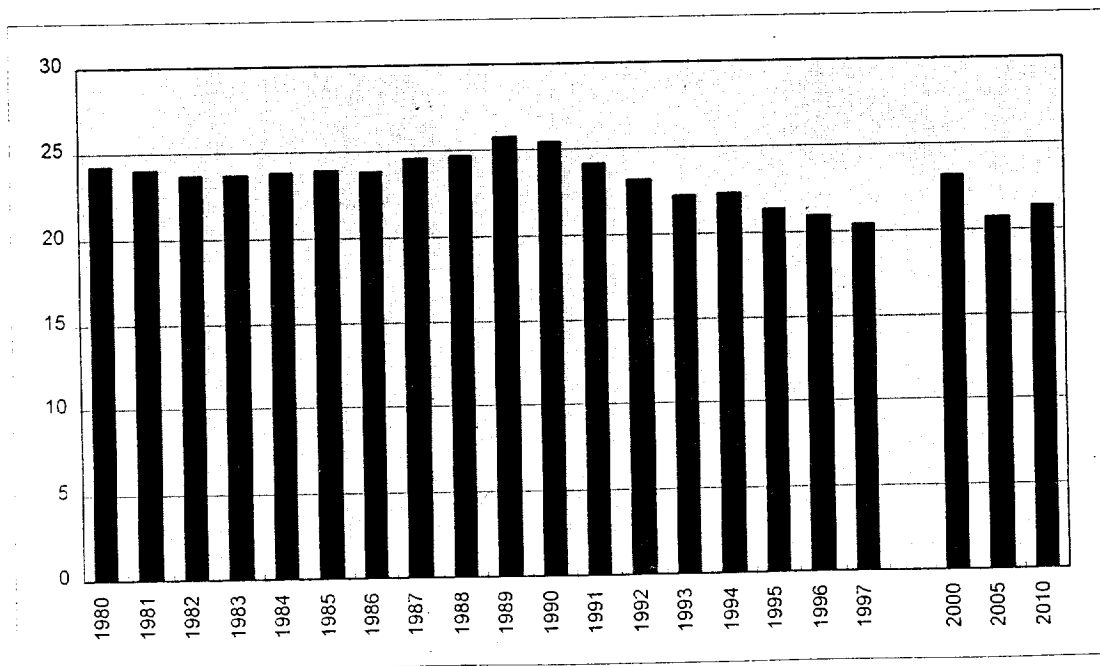


Figure 5. Emissions of non-methane volatile organic compounds in the EMEP area (millions of tonnes NMVOC)

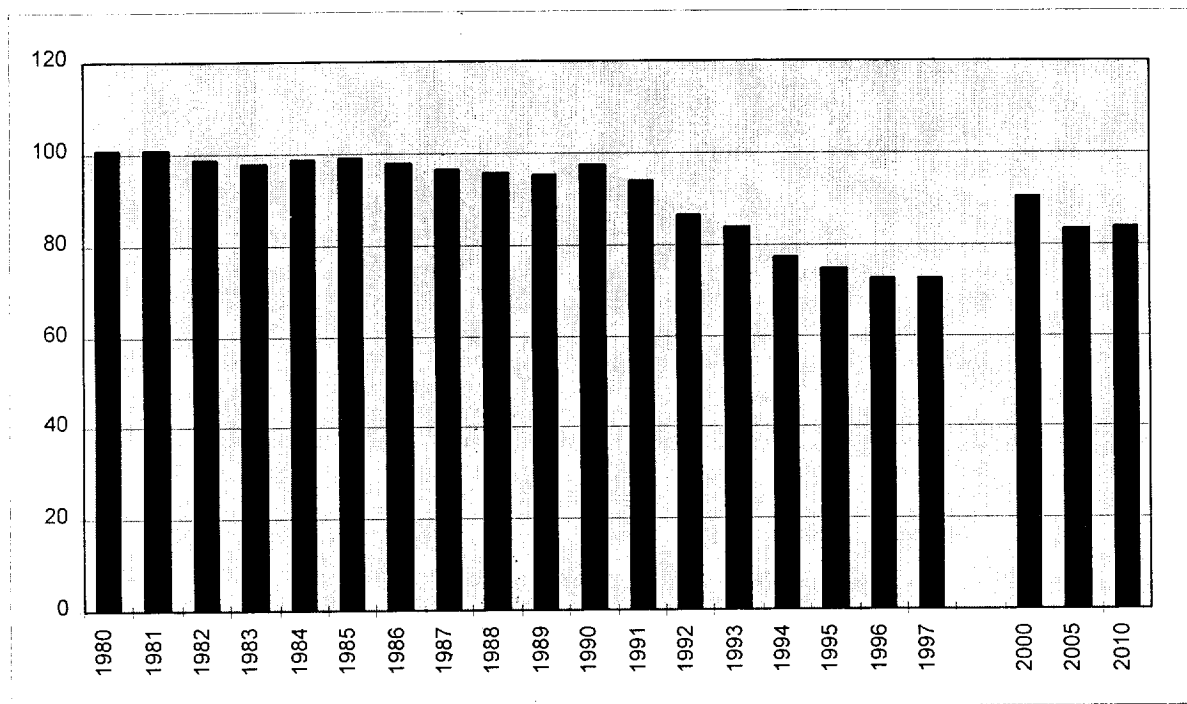


Figure 6. Emissions of carbon monoxide in the EMEP area (millions of tonnes CO)

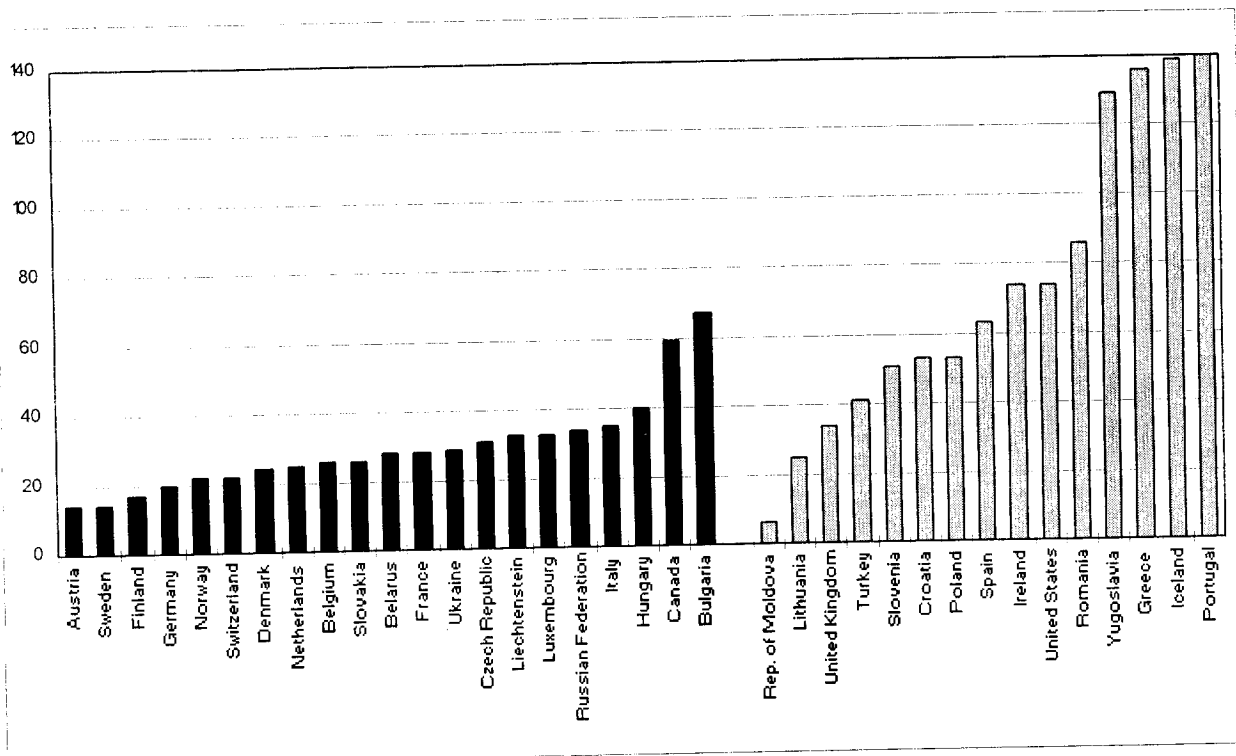


Figure 7. Emissions of sulphur in the ECE region as a percentage of 1980 levels (based on the latest data available, see table 1). Parties to the 1985 Sulphur Protocol are on the left and highlighted (dark). No emission data have been received for the reference year for: Armenia, Bosnia and Herzegovina, Cyprus, Georgia, Latvia, Malta, the FYR of Macedonia and the European Community (non-Parties).

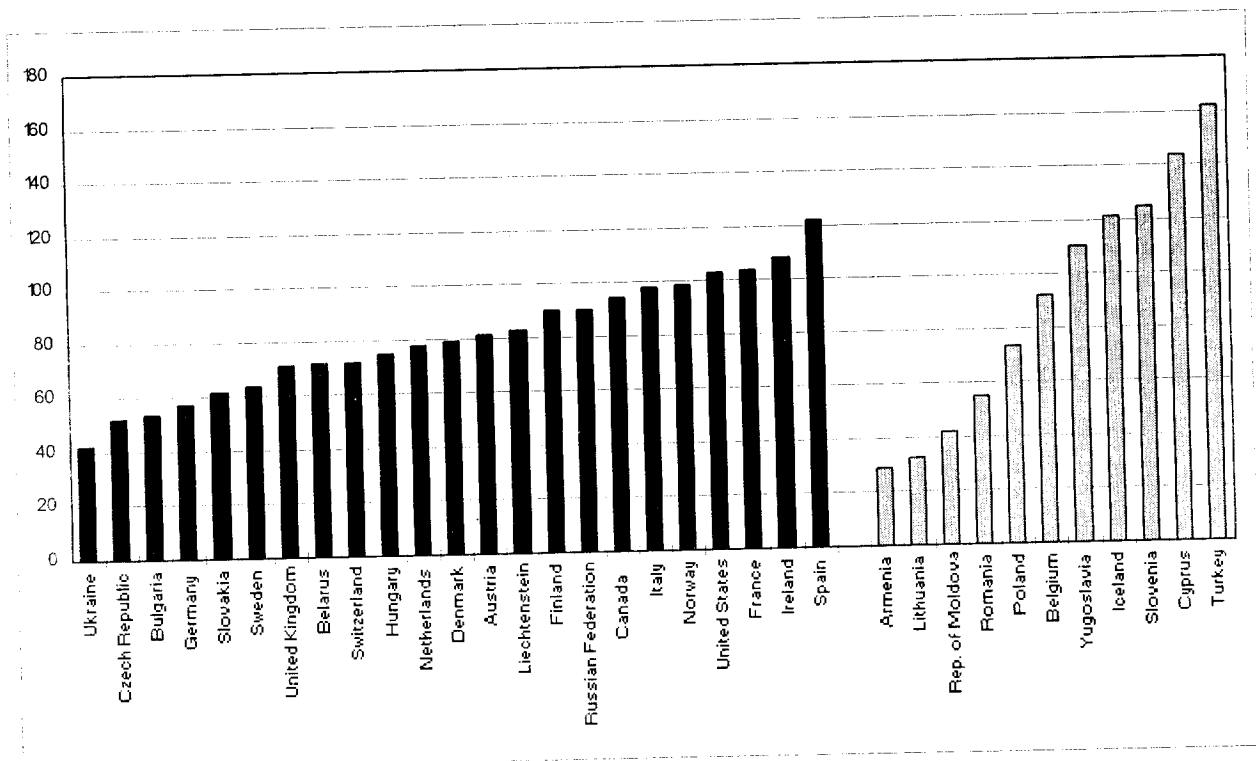


Figure 8. Emissions of nitrogen oxides in the ECE region as a percentage of 1987 levels (based on the latest data available, see table 2). Parties to the 1988 NO_x Protocol are on the left and highlighted (dark). No emission data have been received for the reference year for: Greece, Luxembourg and the European Community (Parties to the Protocol), Bosnia and Herzegovina, Croatia, Georgia, Latvia, Malta, Portugal and the FYR of Macedonia (non-Parties).

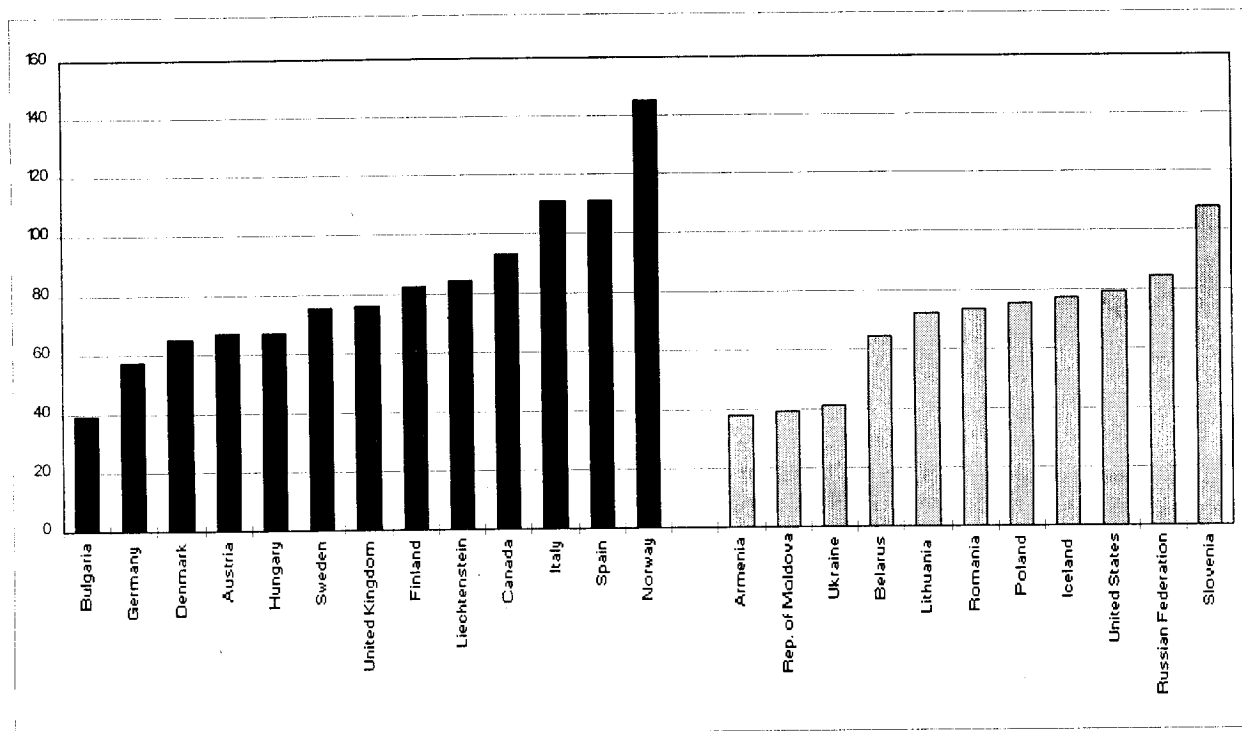


Figure 9. Emissions of non-methane volatile organic compounds in the ECE region as a percentage of 1988 levels (based on the latest data available, see table 4). Parties to the 1991 VOC Protocol are on the left and highlighted (dark). No emission data have been received for the reference year for: the Czech Republic, France, Luxembourg, the Netherlands and Switzerland (Parties to the Protocol), Bosnia and Herzegovina, Belgium, Croatia, Cyprus, Georgia, Greece, Ireland, Latvia, Malta, Portugal, Slovakia, the FYR of Macedonia, Turkey, Yugoslavia and the European Community (non-Parties).