



**Economic and Social
Council**

Distr.
GENERAL

EB.AIR/2000/1/Add.2
20 September 2001

ORIGINAL: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

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

Nineteenth session, Geneva, 11 - 14 December 2001
Item 8 of the provisional agenda

DRAFT
2000 REVIEW OF STRATEGIES AND POLICIES
FOR AIR POLLUTION ABATEMENT

Draft report prepared by the secretariat

Addendum

NOTE: At the eighteenth session of the Executive Body (28 November to 1 December 2000), the secretariat introduced the draft 2000 review of strategies and policies for air pollution abatement (EB.AIR/2000/1; EB.AIR/2000/1/Add.1, and EB.AIR/2000/1/Add.3). Due to technical difficulties, document EB.AIR/2000/1/Add.2 ("The Extent of Implementation") was not issued and the secretariat was asked to redraft it, on the basis of the replies received to questions 1-49 of the 2000 Questionnaire and emission data received, and in line with chapter V of the last Major Review of Strategies and Policies for Air Pollution Abatement. The following assessment of the progress made in the implementation of the Protocols to the Convention that are in force is in response to that request.

The secretariat has also issued corrigenda to the three documents that were presented at the eighteenth session.

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.

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III. EXTENT OF IMPLEMENTATION

- A. The 1985 Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent

22 Parties to the 1985 Sulphur Protocol (as of 27 July 2001): Austria, Belarus, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Estonia,* Finland, France, Germany, Hungary, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Russian Federation, Slovakia, Sweden, Switzerland and Ukraine. (*Estonia ratified on 7 March 2000).

Article 2, basic provisions

1. The Protocol contains two requirements of Parties that remain of particular relevance. Under article 2, Parties shall reduce their national annual sulphur emissions or their transboundary fluxes by at least 30 per cent as soon as possible and at the latest by 1993, using 1980 levels as the basis for the calculation of reductions. At the seventh session of the Executive Body in December 1989, the then Parties to the Protocol expressed a common understanding about the interpretation of this provision, saying it meant that “reductions to that extent should be reached in that timeframe and the levels maintained or further reduced after being reached” (ECE/EB.AIR/20, para. 22). The Chairman of the Executive Body reminded Parties of this understanding at the

eighth session (ECE/EB.AIR/24, para. 18), and the Executive Body confirmed it at its tenth session in November 1992 (ECE/EB.AIR/33, para. 14).

2. The Present State of Emission Data (EB.AIR/GE.1/2000/6, table 1) shows the anthropogenic emissions of sulphur (1980-2010) in the ECE region. According to the official submissions, all (21) Parties to the Protocol met the required reductions in 1993 and maintained these levels except for **Bulgaria**. While achieving the required reductions in 1993, **Bulgaria's** emissions were only 28% below its 1980 level in 1994 and 27% in 1995, but it met the target again in the years 1996 to 1998. For **Estonia**, the Protocol entered into force only on 5 June 2000, but available data suggest its full compliance.

Article 4, reporting of annual emissions

3. Article 4 of the Protocol requires Parties to report emissions of sulphur annually to the Executive Body. Complete reports on national annual emissions for the latest year covered by reporting (1998) were received from 14 of the 22 Parties. **Italy, Liechtenstein and Ukraine** did not submit any of the required sulphur emissions data for 1998. **Belgium, Finland, France, Hungary and Slovakia** reported only preliminary data.

4. The Third Report of the Implementation Committee (EB.AIR/2000/2), updating information previously presented by it to the Executive Body (EB.AIR/1999/4, table 2), gives an overview of emission data reporting by the Parties to the Protocol. 96% of the required annual total emission data were reported with 90% of the data reported as final and covering all emission source categories. There remained some concern, however, over a few Parties that had been consistently in non-compliance with their emission data reporting requirements under the Protocol. At the time of the third session of the Implementation Committee (28 November – 1 December 2000), the **Russian Federation** had not submitted emission data covering all relevant sources for the base year, but subsequently gave a full submission in February 2001. **Liechtenstein** had not submitted any data for the years 1995-1998. **Luxembourg** had not provided any data for the years 1987-89 and 1991-92.

5. Taken as a whole, the majority of Parties (13) consistently reduced their emissions on an annual basis between the years 1993 and 1998. An additional 6 countries saw slight increases in their sulphur emissions during this period, but managed to reduce them in subsequent years. The exception was **Canada**, which saw a consistent increase every year between 1993 and 1998, and did not expect to see a reduction in the coming years, according to projections for 2005 and 2010.

Article 6, national programmes, policies and strategies

6. Article 6 of the Protocol calls on Parties to develop national programmes, policies and strategies which shall serve as a means of reducing sulphur emissions, or their transboundary fluxes, by at least 30 per cent as soon as possible and at the latest by 1993, and to report on progress toward achieving this goal to the Executive Body. This obligation is reflected in question 1 of the questionnaire and is mandatory for all Parties to the Protocol. As indicated in the annex (Status of implementation of protocol obligations), all Parties to the Protocol replied to question 1, with the exception of **Liechtenstein, Luxembourg and Ukraine** (18 of the then 21 Parties). All respondents indicated the current programmes, policies and strategies in place at the national level that specifically address the reduction of sulphur emissions. While **France's** response to question 1 indicated only its reduction in emissions, it elaborated on various policy measures and targets under question 18 on the 1994 Sulphur Protocol.

B. The 1988 Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes

28 Parties to the 1988 Nitrogen Oxides Protocol (as of 27 July 2001): Austria, Belgium,* Belarus, Bulgaria, Canada, Czech Republic, Denmark, Estonia, ** Finland, France, Germany, Greece, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Russian Federation, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, United States and European Community. (*Belgium ratified on 31 October 2000; ** Estonia ratified on 7 March 2000).

Article 2, basic obligations, paragraph 1, reductions in national annual emissions of nitrogen oxides or their transboundary fluxes

7. Under article 2, paragraph 1, the principal obligation of Parties to the Protocol is to control and/or reduce total annual emissions of nitrogen oxides or their transboundary fluxes so that these, at the latest by 31 December 1994, do not exceed such emissions for 1987. At its fourteenth session in December 1996, the Executive Body confirmed its understanding that the obligation "should be taken to mean that emission levels for the years after 1994 should not exceed those specified in that paragraph" (ECE/EB.AIR/49, paragraph 21).

8. According to official submissions (EB.AIR/GE.1/2000/6) 17 of the 26 Parties at the time had met the emission reduction requirements for each of the years 1994-1996, with some Parties (**Bulgaria, Czech Republic, Germany and Ukraine**) going further. Emissions data reported for subsequent years show that 15 of the now 28 Parties to the Protocol (as of July 2001) saw

consistent reductions in NO₂ emissions between the years 1996 and 1998. Three Parties (**Estonia, Hungary and Norway**) showed a continued increase in NO_x emissions during the same period.

9. Official submissions suggest that the emission reduction obligation was not met for several years between 1994 and 1998 by 3 of the then 27 Parties to the Convention. According to reported emissions data (EB.AIR/GE.1/2000/6), the following Parties were not in compliance:

(a) **Ireland** ratified the Protocol in 1994. Its emissions were 4% above the 1987 level in 1996, 3% in 1997 and 6% in 1998. At the eighteenth session of the Executive Body, the delegation of Ireland said that its problems in reducing nitrogen oxide emissions were due to an unexpected growth in road transport. It had initiated policies and measures for more sustainable transport and hoped to be back into compliance soon;

(b) **Spain's** emissions were 21% above the 1987 level in 1994 and 1995 and 19% in 1996. No data have been reported for subsequent years;

(c) At the third meeting of the Implementation Committee, the **United States** reported that it had specified a different base year (1978) when it signed the Protocol, with the consequence that its obligation became to control and/or reduce its total annual emissions of nitrogen oxides or their transboundary fluxes so that these, at the latest by 31 December 1994, did not exceed the 1978 level (21,830 kt). In addition, it had to ensure that its national average annual transboundary fluxes or national average annual emissions for the period from 1 January 1987 to 1 January 1996 did not exceed those for the calendar year 1987. Emission data provided by the United States show that it did not achieve stabilization of emissions at 1978 levels in 1994. Its emissions were 5% above the 1978 level in 1994, 4% in 1995, 2% in 1996, 3% in 1997 and 1% in 1998. Additionally, its average annual emissions in the period 1 January 1987 to 1 January 1996 (22,128 kt) were above its emissions in 1987 (20,689 kt) (EB.AIR/2000/2, paragraph 31). However, at the eighteenth session of the Executive Body, the delegation of the United States indicated that there had been national implementation problems with diesel engine manufacturers. This had required a reassessment of emission estimates. New emission estimates had been reported for recent years, but not yet for the base year of the Protocol. With updated emission estimates also for the base year, the United States would still have to be considered to have been in non-compliance in 1994 by 1.2 to 3%, but was back in compliance since. The delegation indicated it would submit more detailed information to the secretariat (ECE/EB.AIR/71, paragraph 21).

10. Under paragraph 1(a) of article 8 of the Protocol, Parties are required to report annually their levels of national emissions of nitrogen oxides. Since the following Parties have not reported emission data for the base year, it was not possible to assess their compliance for any year:

- (a) **Greece** had not provided emissions data for the base year;
- (b) **Luxembourg** had not submitted emission data for the base year (1987), or for the years 1991, 1992 and 1993;
- (c) **The Russian Federation** had reported only partial data for the base year (1987), not covering all sources. (It subsequently gave a full submission, both totals and sectoral data in February 2001);
- (d) **The European Community** had not reported NO_x emissions for any year. At the eighteenth session of the Executive Body, the representative of the European Community admitted that, despite efforts to improve the situation, problems concerning the timeliness and completeness of data reporting persisted. The EC would investigate means to remedy the situation, but underlined that it was the only Party to the Convention that was not a country, rather an entity made up of several countries. The EC was therefore dependent on the contributions from its Member States.

11. The following Parties had not reported emission data for the most recent year (1998) by the time of the sixth meeting of the Implementation Committee in September 2000:

- (a) **Finland, France, Hungary and Slovakia** had submitted only preliminary or partial data;
- (b) **Italy, Liechtenstein, Spain and Ukraine** had not reported any data. **Italy** subsequently gave a partial submission (totals only from 1991-1999) in May 2001.

Article 2, basic obligations, paragraph 2, major new stationary sources and/or source categories, new mobile sources and major existing stationary sources

12. Under article 2, paragraph 2 (a), Parties shall, no later than two years after the date of entry into force of the Protocol, apply national emissions standards to major new stationary sources and/or source categories, and to substantially modified stationary sources in major source categories, based on the best available technologies which are economically feasible, taking into consideration the Technical Annex. Under article 2, paragraph 2 (b), Parties shall apply national emissions standards to new mobile sources in all major source categories based on the best available technologies which are economically feasible, taking into consideration the Technical Annex and the relevant decisions of the ECE Inland Transport Committee. Under article 2,

paragraph 2 (c), Parties shall introduce pollution control measures for major existing stationary sources, taking into consideration the Technical Annex and the characteristics of the plant, its age and its rate of utilization and the need to avoid undue operational disruption. Questions 3-5 address these obligations.

13. Replies received from Parties to questions 3-5 indicate that all respondents made progress in applying national emissions standards to major new stationary sources and new mobile sources and in the introduction of pollution control measures for major existing stationary sources, in line with the Technical Annex to the Protocol. However, **Canada, Finland, Greece, Hungary, the Russian Federation and the United Kingdom** failed to indicate the pollution measures applied (and often the units and statistical treatment) especially for question 4 on new mobile source categories. Moreover, the responses from **Sweden** to all three questions should be considered insufficient. Apart from the above, all Parties can be considered to have implemented the obligations of the Protocol in this section. Examples are elaborated below.

14. **Bulgaria, Greece, Ireland and Italy** noted they were following the European Union's (EU) Large Combustion Plant Directive 88/609/EEC (major source category definition and emission limit values (ELVs)). Other Parties indicated that their standards for existing stationary sources were identical to emission standards for new stationary sources. In **Italy**, national glass industries signed a voluntary agreement to introduce measures to reduce NO_x emissions from glass production by 50% (1998-2002). **Hungary** lists ELVs of NO_x that may not be exceeded after 1 January 2001 for the glass and cement industries, burning of limestone, bauxite in rotary kilns and production of lime. Technical solutions were proposed by many Parties, such as the introduction of new combustion technologies and modifying processes and combustion (**Ukraine**), and retrofitting of existing plants within five years after entry into force of ELVs (**Switzerland**).

Article 8, paragraphs 1 and 2, on information exchange and annual reporting

15. Under article 8, paragraphs 1 and 2, Parties shall exchange information by notifying the Executive Body of the national programmes, policies and strategies that they develop in accordance with article 7 and by reporting to it annually on progress achieved under them and any changes made to them. Question 2 of the questionnaire addresses this requirement.

16. As indicated in the annex, all Parties to the Protocol replied to question 2 on national strategies, policies and programmes to reduce NO_x emissions, with the exception of **Liechtenstein** and **Luxembourg** (24 of the then 26 Parties). All respondents attempted to indicate the current programmes, policies and strategies in place at the national level that

specifically address the control and reduction of emissions of nitrogen oxides or their transboundary fluxes. This included progress achieved under them and any changes made to them, and in most cases they listed their relevant laws, directives, national plans, objectives or targets. As indicated in the annex, all Parties that replied can be considered to have implemented this obligation of the Protocol, with the exception of **Ukraine**, which had no policies in place for the reduction of NOx. However, the following Parties should be encouraged to report in greater detail in subsequent questionnaires: **Denmark, Finland, Germany, Greece, Hungary, Netherlands, Spain** and **Sweden**.

Article 8, paragraph 1 (d), information exchange and annual reporting of progress
in making unleaded fuel available

17. Under article 4, Parties shall make unleaded fuel sufficiently available, in particular cases as a minimum along main international transit routes, to facilitate the circulation of vehicles equipped with catalytic converters. Under paragraph 8, paragraph 1(d), Parties shall exchange information on progress in making unleaded fuel available. Question 6 addresses this requirement.

18. All Parties to the Protocol responded to question 6 on unleaded petrol, except **Liechtenstein** and **Luxembourg** (24 respondents of the then 26 Parties). All respondents stated that they had made progress toward making unleaded fuel available, although not all indicated whether unleaded petrol was sufficiently available along main international transit routes and the percentage of total sales. All Parties that replied can be considered to have implemented these obligations of the Protocol. Examples are elaborated below.

19. According to the replies to the questionnaire, all Parties have phased out leaded petrol except: **Bulgaria** (deadline for complete phase-out 31 December 2003); **Croatia** (leaded petrol to be phased out in 2005); **Czech Republic** (sale of unleaded petrol will be terminated on 1 January 2001); **Georgia** (working on a programme to phase out lead by 2005); **Greece** (expected to phase out leaded petrol by 31 December 2001); **Italy** (will phase out the use of leaded petrol in 2002 but unleaded petrol is available along all transit routes); **Latvia** (unleaded petrol is 99.5% of the total, but no date was given for a phase-out); **Poland** (lead-free consumption in 1999 was 78% of total use with a phase-out scheduled for 2005); **Russian Federation** (only unleaded petrol used in major cities and at filling stations along international highways); **Ukraine** (leaded petrol will be phased out by 2005); the **European Community** responded that leaded petrol was phased out in the 15 Member States, except that **Spain, Greece** and **Italy** could continue to market leaded petrol until 31 December 2001. **France** may do so also in its Overseas Departments until 31 December 2004 (EB.AIR/2000/1).

Article 8, paragraph 1 (e), exchange of technology

20. Under article 3, paragraph 1, Parties shall facilitate the exchange of technology to reduce emissions of nitrogen oxides; under article 8, paragraph 1 (e), Parties shall exchange information on measures taken to facilitate the exchange of technology. Question 7 addresses the requirements concerning the exchange of technology.

21. Most Parties to the Protocol replied to question 7 on measures taken to facilitate the exchange of technology related to the reduction and control of emissions of nitrogen oxides (22 of the then 26 Parties), the exceptions were, **Hungary, Liechtenstein, Luxembourg, and Ukraine**. As indicated in the table, all Parties that replied can be considered to have implemented this obligation of the Protocol. Examples are elaborated below.

22. According to their replies, Parties have engaged in a host of measures, projects and programmes to facilitate the exchange of technology related to the reduction and control of emissions of NO_x. Many of the Parties that are Member States of the European Union cited EU programmes, such as the EU IMPEL network in the drafting of best available technology (BAT) reference documents under the EU Integrated Pollution Prevention and Control (IPPC) Directive (**Belgium**); cooperation in the Phare and Tacis programmes in the area of environmental conservation (**Bulgaria, Italy**) and EU twinning projects to improve air pollution control legislation (**Estonia and Finland**). Three countries cited Internet-accessible information on the exchange of technology (**Canada, Germany and United States**). Germany has developed an Internet system "Cleaner Production Germany" (www.cleaner-production.de) that provides information on projects of clean production and pollution prevention and control (EB.AIR/2000/1).

Article 8, paragraph 1 (f), progress in establishing critical loads

23. Under article 2, paragraph 3 (a), and article 8, paragraph 1 (f), Parties shall cooperate to establish critical loads. Question 8 addresses this obligation. All Parties responded to this question except **Liechtenstein** and **Luxembourg** (24 of the then 26 Parties).

24. A majority of the Parties to the Protocol that replied to this question indicated they had provided critical loads data to the Working Group on Effects as part of its Mapping Programme; the exceptions were **Canada** (not part of the EMEP geographical domain), **Greece, Slovakia, Spain, Ukraine, the United States** (not part of the EMEP geographical domain) and the **European Community**. **Canada** did, however, publish a critical loads map in its 1990 Canadian Long-range Transport of Air Pollutants and Acid Deposition Assessment Report. The **United**

States established critical levels for ozone, nitrogen dioxide and particulate matter in the form of National Ambient Air Quality Standards (NAAQS), but not critical loads. Critical loads are not yet established in **European Community** legislation but will be in future (EB.AIR/2000/1). Nineteen Parties can be considered to have fully implemented this obligation of the Protocol.

C. The 1991 Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes

21 Parties to the 1991 VOC Protocol (as of 27 July 2001): Austria, Belgium,* Bulgaria, Czech Republic, Denmark, Estonia,** Finland, France, Germany, Hungary, Italy, Liechtenstein, Luxembourg, Monaco,*** Netherlands, Norway, Slovakia,**** Spain, Sweden, Switzerland, United Kingdom. (*Belgium ratified on 31 October 2000; ** Estonia ratified on 07 March 2000; ***Monaco ratified on 26 July 2001;**** Slovakia ratified on 15 December 1999).

Article 2, basic obligations

25. Under the basic obligations of the Protocol, Parties are called on to control and reduce their emissions of volatile organic compounds (VOCs) in order to reduce their transboundary fluxes. Under article 2 of the Protocol, each Party shall, as soon as possible and as a first step, take effective measures to reduce its national annual emission of VOCs by at least 30 per cent by the year 1999, using 1988 levels as a basis or any other annual level during the period 1984 to 1990. The provision in the Protocol that requires concrete reductions in national annual emissions of VOC provides various options, one of which must be chosen by the Party on signature. Table 1 summarizes the target that each Party has accepted and the progress that it has achieved. For all Parties the target has to be attained by the year 1999.

26. The Parties that have chosen article 2, paragraph 2 (a), and 1988 as their base year are: Austria, Belgium, Bulgaria, Estonia, Finland, France, Germany, Hungary, Netherlands, Norway (national), Spain, Sweden and United Kingdom. Parties that have chosen article 2, paragraph 2 (a), but another year as their base year are: Czech Republic (1990), Denmark (1985), Italy (1990), Liechtenstein (1984), Luxembourg (1990), Norway (Tropospheric Ozone Management Area, or TOMA) (1989), Slovakia (1990) and Switzerland (1984).

Table 1
VOC Emissions levels and targets

<i>Party</i>	<i>Emission level change (%) (1998 or latest data available, unless otherwise specified)</i>	<i>Emission level change (%) (2005 or 2010 projection if available)</i>	<i>Requirement (%) (Base year in parentheses)</i>
Austria	- 37 (1988-1998)	-29 (1988-2005) -58(1988-2010)	-30 (1988)
Belgium ^{1/}	-24 (1990-1998)(Brussels capital region)	-59 (1990-2010)	-30 (1988)
Bulgaria	-57(1988-1998)	-37 (1988-2005) -40 (1998-2010)	Stabilization from 1988
Czech Republic ^{2/}	-38 (1990-1998)	-47 (1990-2005) -49 (1990-2010)	-30 (1990)
Denmark	-38(1985-1998)	-57 (1985-2005) -65 (1985-2010)	-30 (1985)
Estonia	-36 (1988-1998)	No projections available	-30 (1988)
Finland	-19 (1998-1997)	No projections available	-30 (1988)
France ^{1/}	-26 (1988-1998)	-32 (1988-2005) -59 (1988-2010)	-30(1988)
Germany ^{3/}	-48 (1988-1998)	-66 (1988-2005) -69 (1988-2010) ^{4/}	-30(1988)
Hungary ^{5/}	-34 (1988-1998)	- 30 (1998-2005) - 36 (1998-2010)	stabilization from 1988
Italy	-6 (1990-1997)	-27 (1988-2005) -32 (1988-2010)	-30 (1990)
Liechtenstein	-14 (1984-1994)	-43 (1984-2005) -43 (1984-2010)	-30 (1984)
Luxembourg	-32 (1990– 1998)	-53 (1990- 2010)	-30 (1990)
Monaco			-30 (1990)*
Netherlands ^{6/}	-44 (1988-1998)	-65 (1988-2010)	-30 (1988)

<i>Party</i>	<i>Emission level change (%) (1998 or latest data available, unless otherwise specified)</i>	<i>Emission level change (%) (2005 or 2010 projection if available)</i>	<i>Requirement (%) (Base year in parentheses)</i>
Norway	+39 (1988-1998, national); +26 (1989-1998 TOMA)	-21 (1988-2010, national); -21 (1989-2010, TOMA)	-30 (1988, national); -30 (1989, TOMA)
Slovakia	-32 (1990-1997)	No projections available	-30 (1990)
Spain ^{7/}	-7 (1988-1996)	No projections available	-30 (1988)
Sweden	-26 (1988-1998)	-43 (1988-2005) -57 (1988-2010)	-30 (1988)
Switzerland ^{8/}	-42 (1984-1998)	-54 (1984-2005) -56 (1984-2010)	-30 (1984)
United Kingdom	-28 (1988-1998)	-46 (1988-2005) -45 (1988-2010)	-30 (1988)

1/ 1998 data are provisional.

2/ Figures for 2005 are preliminary; figures for 2010 are national emission ceilings from the Gothenburg Protocol.

3/ Emissions from international traffic, marine bunkers and managed forests are not included.

4/ Projections 2010: 1150 kt includes measures taken or already started; 995 kt includes additional measures to be taken to meet the targets of the Gothenburg Protocol.

5/ 1998 data are provisional.

6/ Recalculations based on new methodology from 1996 onwards.

7/ Figures apply to the European part within EMEP.

8/ Projections for 2010 as negotiated in the Gothenburg Protocol.

* Monaco ratified the VOC Protocol on 26 July 2001.

27. The table shows that 12 Parties have already achieved the target levels of the Protocol. A further five appear to be on course to do so in the coming years. Notable exceptions are **Italy** and **Spain**, with only 6% and 7% reductions respectively over 1988-1998, and **Norway**, whose emissions rose 39% at the national level and 26% for its TOMA. No projections were available for **Estonia, Finland, Slovakia or Spain**.

28. In **Belgium**, information on the **Brussels capital region** indicates that, between 1990 and 1997, VOC emissions in Belgium dropped by 10%. Brussels accounts for 5% of the country's emissions. These are produced primarily by motor vehicles (48%). In **Bulgaria**, total VOC emissions in 1998 were lower than both those in 1988 and those in 1990. The total annual VOC emissions for 1999 are expected to be lower again than those in 1988 and 1990. In the **Czech**

Republic, VOC emissions have decreased mainly as a result of the rapid increase in passenger cars with catalytic converters.

29. **Denmark** has a voluntary agreement (1995) with the Confederation of Danish Industries to reduce emissions from important industrial sources by 40% before 1999 compared to 1988. That target has been met. Denmark reduced its total annual VOC emissions for the period 1985 – 1999 by 30% in accordance with its commitments. In **Finland**, the reduction in VOC emissions was approximately 20% between 1988 and 1998 (25% for stationary sources and 15% for transport).

30. In **Italy**, there was a substantial reduction in VOC emissions in the chemical industry sector for the period 1989 – 1994 and an increase in VOC emissions in the transport sector during the nineties. In **Norway**, in the period 1989-1998, non-methane VOC (NMVOC) emissions corresponding to the economic zone south of 62°N increased by 13%. For the whole country, however, the increase was as high as 39%. This was due primarily to emissions from oil production in the North Sea. These oil production operations counteracted reductions resulting from measures such as stricter emission standards for passenger cars (1989). As a result, the Government implemented, for example, EU Directive 94/63/EC and intensified measures to reduce emissions during the loading of crude oil, etc.

Article 8, information exchange and annual reporting, in accordance with article 7,
national programmes, policies and strategies, and article 2, paragraph 2 (a), (b) and (c),
effective measures for the reduction of VOCs

31. Article 2, paragraph 2 (a), requires effective measures to be taken to reduce the national annual VOC emissions by at least 30 per cent by the year 1999, using 1988 as the base year (or another year as indicated by the country on signature and reflected in the table above). Article 7 calls on Parties to develop programmes, policies and strategies toward this end. Article 8 requires Parties to notify the Executive Body of these, as well as on progress made in applying emission standards and control techniques and in exchanging technology. Question 9 (9bis and 9ter) addresses these requirements.

32. Fifteen of the then 17 parties to the Protocol replied to question 9, 9bis or 9ter, depending on which base year and paragraph of article 2 was selected by the Party upon ratification. **Liechtenstein** and **Luxembourg** failed to reply. As indicated in the annex, all Parties that replied complied with this obligation in elaborating their national policies and programmes established for both stationary and mobile sources. Various Parties cited EC Directive 99/13/EC on the limitation of emissions of VOCs due to the use of organic solvents in certain activities and installations

(Belgium, Finland, Poland and Spain). Sweden cited six major tools to reduce VOC emissions, including EU emissions standards for major sources, for on-road vehicles and for off-road vehicles; environmental classification of fuels and vehicles; regulations for the reduction of emissions from petrol distribution and technical development and environmental information; and small-scale wood-burning facilities.

Article 8, paragraph 2 (b), information exchange and reporting, and article 2, paragraph 3 (a)(i), on the application of appropriate national or international emission standards to control and reduce VOC emissions from new stationary sources

33. Article 8, paragraph 2 (b), requires Parties to report annually on progress made in applying national or international emissions standards and control techniques and on measures taken to facilitate the exchange of technology. Article 2, paragraph 3 (a)(i), calls on Parties to apply appropriate national or international emission standards to new stationary sources based on the best available technologies. Question 10 addresses this requirement.

34. All Parties to the Protocol, with the exception of **Liechtenstein** and **Luxembourg**, replied to question 10 on the application of appropriate standards to control and reduce VOC emissions from new sources (15 of the then 17 Parties). As indicated in the annex, all Parties that replied can be considered to have implemented this obligation of the Protocol. Examples are elaborated below.

35. Several Parties identified emissions standards with regard to all stationary sources where pollution control measures apply and special emission limit values for other source categories, when available, often, as above, based on EU Directive 1999/13/EC (**Denmark, Netherlands, Slovakia, Spain, Sweden**). **Austria** cited emission standards for 15 source categories, while **Germany** identified emissions standards for all stationary sources subject to permitting with the pollution control measures applied and special emission limits values for 11 other source categories. In the **United States** (non-Party), new source performance standards (NSPS) have been established for 29 major categories of major new stationary sources of VOCs. **Norway** indicated that there had been no new stationary source categories since September 1999.

Article 8, paragraph 2 (b), and article 2, paragraph 3 (b)(i), on progress made in applying measures to control and reduce VOC emissions from existing stationary sources

36. Article 8, paragraph 2 (b), and article 2, paragraph 3 (b)(i), call on Parties to apply, in those areas in which national or international tropospheric ozone standards are exceeded or where transboundary fluxes originate or are expected to originate, the best available technologies that are

economically feasible to existing stationary sources taking into consideration annex II, and to report annually on progress made. Question 11 addresses these requirements.

37. With the exception of **Liechtenstein** and **Luxembourg**, all Parties to the Protocol replied to question 11 on the application of appropriate standards to control and reduce VOC emissions from new stationary sources (15 of the then 17 Parties). As indicated in the annex, almost all respondents can be considered to have implemented this obligation of the Protocol. The exception was **Spain**, whose response (referring to legislation and strategies of the European Community where the EC described only research and studies) should be considered insufficient.

38. **Bulgaria** (non-Party) identified new programmes for the reduction of emissions from existing stationary sources, including a pilot project for industry producing lacquer, dyes and pharmaceuticals. In the **Netherlands**, environmental permits are used to control and reduce VOC emissions from existing stationary sources. Process-oriented and/or process-integrated measures were formulated for four sectors. **Canada** (non-Party) identified eight major source categories and provided detailed information on the emissions standards and technologies applied.

Article 8, paragraph 2 (b), and article 2, paragraph 3 (b)(ii), on progress made in introducing techniques to reduce VOC emissions from petrol distribution and motor vehicle refuelling operations and to reduce the volatility of petrol

39. Article 8, paragraph 2 (b), and article 2, paragraph 3 (b)(ii), call on Parties to apply techniques to reduce VOC emissions from petrol distribution and motor vehicle refuelling operations, and to reduce volatility of petrol, taking into consideration annexes II and III, and to report annually on progress made. Question 12 addresses this requirement.

40. The Parties to the Protocol, with the exception of **Liechtenstein** and **Luxembourg**, replied to question 12 on the progress made in introducing techniques to reduce VOC emissions from petrol distribution and motor vehicle refuelling operations (15 of the then 17 Parties). The **European Community** (non-Party) promulgated Directive 94/63/EC (VOC Stage-I Directive) on the control of emissions of VOCs resulting from the storage of petrol and its distribution from terminals to service stations. Many Parties refer to this Directive in replying to the question (**Belgium, Bulgaria, Denmark, Finland, Greece, Netherlands, Norway, Sweden, United Kingdom**), as well as to Council Directive 1999/13/EC on the limitation of emissions of VOCs. In the **United States** (non-Party), since the 1998 model year, passenger cars have had a vapour recovery system that completely eliminates VOC emissions from vehicle refuelling. From the 2001 model year, the same will apply to medium-duty trucks. As indicated in the annex, all respondents can be considered to have implemented this obligation of the Protocol.

Article 8, paragraph 2 (b), and article 2, paragraph 3 (a)(iii), on the application of appropriate national or international emission standards for new mobile sources based on best available techniques

41. Article 8, paragraph 2 (b), and article 2, paragraph 3 (a)(iii), call on Parties to apply appropriate national or international emission standards to new mobile sources based on the best available technologies which are economically feasible, taking into consideration annex III, and to report annually on progress made. Question 13 addresses this requirement.

42. All Parties to the Protocol, with the exception of **Liechtenstein** and **Luxembourg**, replied to question 13 on the application of appropriate national or international emission standards for new mobile sources based on best available techniques. As indicated in the annex, all respondents can be considered to have implemented this obligation of the Protocol (15 of the then 17 Parties). Examples are elaborated below.

43. Most Parties refer here to EU directives and EURO standards, while others refer to progress made in applying national emission standards to new mobile sources. **Italy** indicated emission standards for VOCs from 14 new mobile sources (based on EC directives). **Switzerland** listed national emission standards for four mobile source categories that are/will be similar to EC directives. The **Czech Republic** uses emission standards for motor vehicles with hydrocarbon emission limits that take account of UNECE regulations 49/1982, 83/1990 and 96/1996.

Article 8, paragraph 2 (b), and article 2, paragraph 3 (a)(iv), on measures taken to foster public participation in emission control programmes

44. Article 8, paragraph 2 (b), and article 2, paragraph 3 (a)(iv), call on Parties to foster public participation in emission control programmes through public announcements, encouraging the best use of all modes of transport and promoting traffic management schemes, and to report annually on progress made. Question 14 addresses this requirement.

45. With the exception of **Liechtenstein** and **Luxembourg**, all Parties to the Protocol replied to question 14 on measures taken to foster public participation in emission control programmes (15 of the then 17 Parties). As indicated in the annex, most respondents can be considered to have implemented this obligation of the Protocol. Examples are elaborated below. The exception was **Spain**, which referred to EU legislation under question 2; the response was considered insufficient.

46. Parties responded to this question by describing various public information campaigns, including “Car-free cities” day (**Belgium and Finland**), an exhibition “Ozone: Friend or Foe?”, a “Gas-free driving” campaign to encourage the use of public transport, and a series of events to promote sustainable mobility (**Belgium**). **Denmark** set up the “green accounts system” in 1995 as a mandatory environmental reporting system, and held campaigns on “In town without my car” and “Environmental traffic week”. **Italy** organized a monthly car-free Sunday in every major city, car-sharing schemes and the “Blue Label” to indicate a vehicle has passed an annual exhaust test. **Norway** set up a Green Management Programme (GRIP), in collaboration with major business confederations, local authorities, trade unions and environmental NGOs. **Sweden** distributed publications, videos and other public information material issued by the Environmental Protection Agency. **Switzerland** promoted public participation in emission reduction through traffic management schemes and the **United Kingdom** had a public awareness campaign called “Are you doing your bit?”

Article 8, paragraph 2 (b), and article 2, paragraph 3 (a)(ii), on the application of national or international measures to products that contain solvents and the promotion of the use of products that are low in or do not contain VOCs

47. Article 8, paragraph 2 (b), and article 2 paragraph 3 (a)(ii), call on Parties to apply national or international measures to products that contain solvents and promote the use of products that are low in or do not contain VOCs, taking into consideration annex II to the Protocol including the labelling of products specifying their VOC content, and to report annually on progress made. Question 15 addresses this requirement.

48. With the exception of **Liechtenstein** and **Luxembourg**, all Parties to the Protocol replied to question 15 on the application of measures to products that contain solvents (15 of the then 17 Parties). As indicated in the annex, most respondents can be considered to have implemented this obligation of the Protocol. Examples are given below. The exception was **Spain**, which referred to EU legislation under question 2; the response was considered insufficient.

49. Parties indicated a host of measures to limit the use of products that contain solvents. In **Germany**, environmentally friendly products can be awarded the “Blue Angel” label (for solvent-free or low-solvent paints). In **Austria**, products with a high solvent content (above the established limit values) may be sold only for industrial use with restrictions. In the **United Kingdom**, one part of the “Are you doing your bit?” campaign is to persuade the public to use low-solvent coatings and products.

Article 8, paragraph 2 (c), on measures taken to facilitate the exchange of technology related to the reduction and control of VOC emissions

50. Article 8, paragraph 2 (c), calls on Parties to report annually on measures taken to facilitate the exchange of technology. Question 16 addresses this requirement.

51. With the exception of **Liechtenstein** and **Luxembourg**, all Parties to the Protocol replied to question 16 on measures taken to facilitate the exchange of technology related to the reduction and control of VOC emissions (15 of the then 17 Parties). As indicated in the annex, most respondents can be considered to have implemented this obligation of the Protocol. Examples are given below. Exceptions were **Spain** whose reference to EU legislation under question 2 is considered insufficient, and the **Czech Republic** and **Switzerland**, neither of which had particular measures in place.

52. Parties described various programmes on the transfer of technology, such as twinning projects (**Finland** participated in bilateral cooperation projects to improve **Estonia**'s air pollution control legislation); **Austria** identified the "East-Ecofund", which provides project support to neighbouring central and east European countries. **Germany** has developed an Internet system "Cleaner Production Germany", which provides information on projects of clean production and pollution prevention and control, as well as the Transform-Programme and the Twinning Programme for assistance to certain countries. **Hungary**, with the help of the **Netherlands**, started a cooperation programme on VOC reduction in 1992. **Italy** supports and co-finances a number of activities to facilitate access to technologies through bilateral and multilateral cooperation. The **Netherlands** set up an information centre in 1995 called InfoMil (Information Centre for Environmental Licensing) to support and facilitate environmental policy-making.

Article 2, paragraph 5, article 8, paragraph 1, and article 7 on substitution of VOCs

53. Article 2, paragraph 5, article 8, paragraph 1, and article 7 call on Parties to take appropriate steps to ensure that toxic and carcinogenic VOCs and those that harm the stratosphere ozone layer are not substituted for other VOCs, and to report annually on progress made. Question 17 addresses this requirement.

54. All Parties to the Protocol replied to question 17 on measures to ensure that toxic and carcinogenic VOCs are not substituted for other VOCs, with the exception of **Liechtenstein** and **Luxembourg** (15 of the then 17 Parties). As indicated in the annex, most respondents can be considered to have implemented this obligation of the Protocol. Some examples are described below. The exception was **Spain**, which referred to EU legislation under question 2. The response

was considered insufficient.

55. Parties responded to this question by elaborating on their national legislation or regulations. For example, **Austria's** labour safety legislation discourages the replacement of VOCs with toxic or carcinogenic ones. **Belgium, Bulgaria, the Czech Republic, Denmark, Finland, Sweden** and **Switzerland** all have legislation that hinders the substitution of toxic or carcinogenic VOCs for others. Many Parties too refer to the Montreal Protocol, the controls from which make it less likely that VOCs harmful to the stratospheric ozone layer would be substituted for other VOCs.

D. The 1994 Protocol on Further Reduction of Sulphur Emissions

23 Parties to the 1994 Sulphur Protocol (as of 27 July 2001): Austria, Belgium,* Canada, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and the European Community. (*Belgium ratified 31 October 2000.)

Article 2, basic obligations

56. The first requirement (art. 2, para. 1) under the Protocol is for Parties to control and reduce SO₂ emissions in order to protect human health and the environment from adverse effects, in particular acidifying effects, and to ensure, as far as possible, without entailing excessive costs, that depositions of oxidized sulphur compounds in the long term do not exceed critical loads for sulphur, given, in annex I to the Protocol, as critical sulphur depositions, in accordance with present scientific knowledge.

57. The Protocol was the first to be genuinely effects-based and allocating emission reductions to countries to achieve the best overall benefits for Europe. Target reductions were therefore differentiated between Parties. Table 2 summarizes the progress made in reducing SO₂ emissions and lists the emission ceilings for each Party for the first target year (2000).

Table 2
Sulphur emission levels, projected future emissions and emission ceilings (2000)*

<i>Party (as at 16 July 2001)</i>	<i>Current emission levels -- 1998 unless otherwise specified (thousands of tons of SO₂ per year)</i>	<i>Projected emission levels (2005 or 2010)</i>	<i>Emission ceiling from annex II to the Protocol (2000) (thousands of tons of SO₂ per year)</i>
Austria	46	39 (2010)	78
Belgium ^{1/}	203	232 (2005) 106 (2010)	248
Canada	2766	2914(2005) 2914 (2010)	3200 (national) 1750 (SOMA)
Croatia	89	125 (2005) 70 (2010)	133
Czech Republic ^{2/}	443	250 (2005) 283 (2010)	1128
Denmark	77	62 (2005) 50 (2010)	90
Finland ^{3/}	90	No projections available	116
France ^{1/2/3/}	837	650 (2005) 400 (2010)	868
Germany ^{4/5/}	1292	990 (2005) 550 (2010) ^{6/}	83
Greece ^{7/}	540	580 (2005) 546 (2010)	0
Ireland	176	155 (2005) 42 (2010)	155
Italy	1021 (1997)	847 (2005) 842 (2010)	1330
Liechtenstein	0.13 (1994)	0.11 (2005) 0.11 (2010)	0.1
Luxembourg	4	4 (2010)	10
Netherlands ^{8/}	113	50 (2010)	106
Norway	30	22 (2010)	34
Slovakia ^{1/}	179	210 (2005) 210 (2010)	337

<i>Party (as at 16 July 2001)</i>	<i>Current emission levels -- 1998 unless otherwise specified (thousands of tons of SO₂ per year)</i>	<i>Projected emission levels (2005 or 2010)</i>	<i>Emission ceiling from annex II to the Protocol (2000) (thousands of tons of SO₂ per year)</i>
Slovenia	123	78 (2005) 27 (2010)	130
Spain ^{3/}	1498 (1996)	No projections available	2143
Sweden	49	67 (2005) 67 (2010)	100
Switzerland	27	26 (2005) 26 (2010)	60
United Kingdom	1615	1020 850	2449
European Community	No data available	No projections available	9598

* Data are taken from official submissions for 1998 (EB.AIR/GE.1/2000/6).

1/ 1998 data are provisional.

2/ Figures for 2005 and 2010 are preliminary.

3/ Figures apply to the European part within EMEP.

4/ Emissions for 1980-1986 are not updated.

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

6/ Projections 2010: 565 kt includes measures taken or already started; 550 kt includes additional measures to be taken to meet the targets of the Gothenburg Protocol.

7/ Emissions reported for 1980-1985 are to be regarded as indications only, and are not comparable to the emissions reported after 1985.

8/ Recalculations based on new methodology from 1996 onwards.

58. According to table 2, 17 Parties have already attained the emission reductions required (including **Canada** at the national level, but not necessarily for its **SOMA**), while another 3 appear to be on course to do so (**Ireland, Liechtenstein** and **Netherlands**).

Article 5, paragraph 1 (a)

59. Under article 5, paragraph 1 (a), Parties are required to report, through the Executive Body on the implementation of national strategies, policies, programmes and measures referred to in article 4, paragraph 1. Question 18 addresses this issue.

60. With the exception of **Liechtenstein, Luxembourg** and **Slovenia**, all Parties to the Protocol replied to question 18 on the control and reduction of sulphur emissions, (19 of the then 22 Parties). As indicated in the annex, all respondents except Spain can be considered to have implemented this obligation in the Protocol. Spain refers to the European Community reply to question 2; the reply was considered insufficient.

Article 2, paragraph 4, on effective measures for the reduction of sulphur emissions

61. Under article 2, paragraph 4, Parties are called on to make use the most effective measures to reduce sulphur emissions and cites controlling the sulphur content of fuel, energy-efficiency measures, promotion of renewable energy and the application of best available techniques as possible measures to achieve this aim. Question 19 addresses this issue.

62. With the exception of **Liechtenstein, Luxembourg and Slovenia**, all Parties to the Protocol responded to question 19 on measures taken to reduce sulphur emissions from new and existing sources (19 of the then 22 Parties). As indicated in the annex, all respondents can be considered to have implemented this obligation in the Protocol. Examples are described below.

63. All respondents made reference to energy-saving measures or the promotion of renewable energies, and many cited the need to apply best available techniques (BAT), both to new and to substantially changed installations (**Russian Federation (non-Party)**), in operating permits for new enterprises, (**Belgium**), and in the licensing procedure for installations (**Austria**). The **United Kingdom**, as an example, provided detailed information on its measures to: increase energy efficiency; increase the use of renewable energy; reduce the sulphur content of particular fuels and encourage the use of fuel with a low sulphur content (under EC Directive 1999/32/EC).

64. As indicated by the response from the **European Community**, Council Directive 1999/32/EC relating to a reduction in the sulphur content of certain liquid fuels limits the future sulphur content of heavy fuel oil and the maximum sulphur content of gas oil. Council Directive 1998/70/EC relating to the quality of petrol and diesel fuel sets current and future maximum limits on the sulphur content of petrol and diesel fuels

Article 2, paragraph 5 (a)-(b), and article 5, paragraph 1, on applying emission limit values (ELVs)

65. The second Sulphur Protocol is the first in the series to require the mandatory application of emission limit values (ELVs). Article 2, paragraph 5 (a), requires each Party, except those subject to the United States/Canada Air Quality Agreement of 1991, to apply emission limit values at least as stringent as those specified in annex V to all major new stationary combustion sources. Article 2, paragraph 5 (b), calls on Parties to apply, no later than 1 July 2004, emission limit values at least as stringent as those specified in annex V to those major existing stationary combustion sources the thermal input of which is above 500 MW_{th}, and to apply, no later than 1 July 2004, emission limit values or emission limitations to those major existing stationary combustion sources the thermal input of which is between 50 and 500 MW_{th} using annex V as

guidance. Questions 20-22 address these requirements.

66. With the exception of **Liechtenstein, Luxembourg and Slovenia**, all Parties to the Protocol responded to questions 20-22 on emission limit values (19 of the then 22 Parties). As indicated in the annex, all respondents can be considered to have implemented this obligation in the Protocol. Examples are given below.

67. All respondents to all three questions indicated that they had already applied the ELVs of the Protocol (except **Canada**, which was not required to reply). ELVs applied were either identical to or more stringent than those in annex V to the Protocol. **Austria**, for example, said it had six categories of emission standards in force for steam boilers and industrial boilers that were more stringent than those in annex V. **Germany**, as another example, has national emission standards for power generation (according to the type of fuel) and various industrial processes and provides a list of values. **Spain** indicated it followed EU legislation on this matter. The **European Community** noted its reply to question 3: for major stationary sources and all kinds of pollutants, Directive 96/61/EC (IPPC Directive) is the key instrument at the Community level.

Article 2, Paragraph 5 (c), on national standards for the sulphur content of gas oil

68. Article 2, Paragraph 5 (c), calls on Parties to apply, no later than two years after the date of entry into force of the Protocol, national standards for the sulphur content of gas oil at least as stringent as those specified in annex V. Question 23 addresses this issue.

69. With the exception of **Liechtenstein, Luxembourg and Slovenia**, all Parties to the Protocol responded to question 23 on the sulphur content of gas oil (19 of the then 22 Parties). As indicated in the annex, all respondents can be considered to have implemented this obligation in the Protocol. Examples are given below.

70. All respondents indicated their national standards for the sulphur content of gas oil, most of which were at least as stringent as those specified in annex V to the Protocol. In the case of EU Member States, these were in accordance with EU Directive 98/70/EC on the quality of petrol and diesel fuels. Under EC Directive 99/32/EC (which amends 93/12/EEC), the sulphur content of gas oil will be limited to 0.2% from 1 July 2000 and to 0.1% from 1 January 2008. **The European Community** referred to its answer to question 19, which cited both 98/70/EC, which set current and future maximum limits on the sulphur content of petrol and diesel fuels, and Council Directive 99/32/EC described above.

Article 5, paragraph 1, and article 2, paragraph 6, on economic instruments

71. Article 5, paragraph 1, and article 2, paragraph 6, allow Parties to apply economic instruments to encourage the adoption of cost-effective approaches to the reduction of sulphur emissions and to report on them. Question 24 addresses this issue.

72. With the exception of **Liechtenstein, Luxembourg, Slovenia** and the **European Community**, all Parties to the Protocol responded to question 24 on economic instruments (18 of the then 22 Parties). Parties described various measures employed, for example, **Belgium** (non-Party at the time), made subsidies available to enterprises meeting more rigorous standards than those set or those cleaning up polluted sites. Tax deductions are given, moreover, for research and development programmes for new technologies for the prevention of pollution. **Denmark, Georgia, Italy, Norway, Poland** and **Switzerland** have instituted some form of a sulphur tax. In **Denmark** and **Finland**, tax incentives to promote low-sulphur diesel have been in force since 1992. **Ireland** identified three economic instruments it uses.

73. **Austria**, the **Czech Republic** and the **United Kingdom** reported that they did not use economic instruments to reduce emissions, and **Canada** indicated that these are not used at the federal level. The **United Kingdom** noted that it did not operate a system of emission charges or taxes. However, since the Protocol states that Parties “may... apply then requires them to report on whether they have or not (and does not impose their use), all respondents, including Austria, the Czech Republic and the United Kingdom, can be considered to be in compliance with this part of the Protocol. The one exception is **Spain**, which, as in many questions above, refers to the strategies and policies of the **European Community** which did not respond to this issue. **Spain**, therefore, should be considered not to have implemented this obligation of the Protocol and should be encouraged to reply more comprehensively to future questionnaires.

Article 3, paragraph 1, and article 5, paragraph 1 (c), on measures taken to facilitate the exchange of technologies and techniques

74. Article 3, paragraph 1, and article 5, paragraph 1 (c), require each Party to facilitate the exchange of technologies and techniques, including those that increase energy efficiency, the use of renewable energy and the processing of low-sulphur fuels, to reduce sulphur emissions, and to report on them. Question 25 addresses this issue.

75. With the exception of **Liechtenstein, Luxembourg and Slovenia**, all Parties to the

Protocol responded to question 25 on the exchange of technologies (19 of the then 22 Parties). All respondents, with the exception of the **Czech Republic** and **Switzerland**, can be considered to have implemented this obligation of the Protocol.

76. Parties reported on various measures and programmes to promote technologies, such as **Austria**'s "East-Ecofund", which provides support to central and east European countries, "World Sustainable Energy Day" and "Energy Globe 2000". In **Belgium**, all three regions (Wallonia, Flanders and Brussels) participated in the EU IMPEL network, and drafting of BAT pursuant to the EU IPPC Directive. **Denmark** reported that it had desulphurization projects at two power stations in Poland. **Switzerland** said it had no particular activities at the government level, nor did the **Czech Republic**.

Article 5, paragraph 1 (c), and article 3, paragraphs 2 and 3, on procedures established to create more favourable conditions for the exchange of technology to reduce sulphur emissions

77. Article 5, paragraph 1 (c), and article 3, paragraph 2, call on Parties to create favourable conditions by facilitating contacts and cooperation among appropriate organizations and individuals in the private and public sectors that are capable of providing technology, design and engineering services, equipment or finance to reduce sulphur emissions. Article 3, paragraph 3, indicates that Parties shall, no later than six months after the date of entry into force of the Protocol, commence consideration of procedures to create more favourable conditions for the exchange of technology to reduce sulphur emissions. Question 26 addresses this issue.

78. With the exception of **Liechtenstein, Luxembourg, Slovenia** and the **European Community**, all Parties to the Protocol responded to question 26 on research and cooperation (18 of the then 22 Parties). As indicated in the annex, all respondents, with the exception of the **Czech Republic, Slovakia, Spain** and **Switzerland**, can be considered to have implemented this obligation of the Protocol. Examples are given below.

79. Most Parties replied to this question by referring to answers to previous questions, such as question 7 on the exchange of technology for NO_x or question 25 on the exchange of technologies for SO₂. **Finland** reported that it had provided expertise for an EU twinning project to improve Estonia's air pollution control legislation. The **Danish** environmental assistance programme to countries in transition had established demonstration projects introducing cleaner technologies and cleaning processes by means of grants. The **Czech Republic, Slovakia** and **Switzerland** indicated they had no particular projects at the government level.

Article 5, paragraph 1 (c), and article 6, on activities undertaken with a view to encouraging research, development, monitoring and cooperation related to the Protocol.

80. Article 5, paragraph 1 (c), and article 6, call on Parties to encourage research, development, monitoring and cooperation. Question 27 addresses this issue.

81. With the exception of **Liechtenstein, Luxembourg, Slovenia** and the **European Community**, all Parties to the Protocol responded to question 27 on research and development (18 of the then 22 Parties). All respondents, with the exception of **Greece, Spain** and **Slovakia**, can be considered to have implemented this obligation of the Protocol.

82. **Austria** reported that ambient air concentrations of SO_x were monitored at about 150 monitoring stations, and cited research carried out on critical loads, deposition of sulphur compounds, dispersion and receptor modelling of air pollutants and integrated monitoring of air pollution effects on ecosystems. Other Parties cited research on critical loads (**Croatia, Ireland, Italy, Norway, Poland, Switzerland**). Additional research projects focused on: renewable energy (**Germany**), integrated assessment modelling, effects of acidification on forest and lakes (**Canada, Italy, Sweden and Switzerland**) and cost-curves (**United Kingdom**).

Note

In United Nations texts, the term “ton” refers to metric tons.

Annex

STATUS OF IMPLEMENTATION OF PROTOCOL OBLIGATIONS
Based on the replies to the 2000 Questionnaire on Strategies and Policies
for Air Pollution Abatement

PARTY	1985 Sulphur Protocol				1988 NOx Protocol			
	Replied (Q. 1)	Reply indicates implementatio n	Reply insufficien t	No reply	Replied (Q.2-8)	Reply indicates implementatio n	Reply insufficien t	No reply
Austria	X	X			X	X		
Belarus	X	X			X	X		
Belgium	X	X			X	X		
Bulgaria	X	X			X	X		
Canada	X	X			X		X(Q.2)	
Croatia	N.A.	N.A.			N.A.	N.A.		
Czech Rep.	X	X			X	X		
Denmark	X	X			X	X		
Estonia	N.A.	NA.			N.A.	N.A.		
Finland	X	X			X		X(Q.2)	
France	X	X			X	X		
Germany	X	X			X	X		
Greece	X	X			X		X(Q.2)	
Hungary	X	X			X		X(Q.2,4)	
Ireland	N.A.	N.A.			X	X		
Italy	X		X		X	X		
Liechtenstein				X				X
Luxembourg				X				X
Monaco	N.A.	N.A.			N.A.	N.A.		
Netherlands	X	X			X	X		
Norway	X	X			X	X		
Portugal	N.A.	N.A.			N.A.	N.A.		
Russian Federation	X	X			X		X	
Slovakia	X	X			X		X	
Slovenia	N.A.	N.A.			N.A.	N.A.	N.A.	
Spain	N.A.	N.A.			X		X(Q.2)	
Sweden	X	X			X		X(Q.2)	
Switzerland	X	X			X	X		
Ukraine				X				X
United Kingdom	N.A.	N.A.					X	
United States	N.A.	N.A.			X		X(Q.2,8)	
Yugoslavia	N.A.	N.A.			N.A.	N.A.		
European Community	N.A.	N.A.			X		X	

N.A. - Not applicable as not Party to the Protocol

PARTY	1991 VOC Protocol				1994 Sulphur Protocol			
	Replied (Q.9-17)	Reply indicates implementation	Reply insufficient	No reply	Replied (Q.18-27)	Reply indicates implementation	Reply insufficient	No reply
Austria	X	X			X	X		
Belarus	N.A.	N.A.			N.A.	N.A.		
Belgium	N.A.	N.A.			N.A.	N.A.		
Bulgaria	X	X			N.A.	N.A.		
Canada	N.A.	N.A.			X	X		
Croatia	N.A.	N.A.			X	X		
Czech Rep.	X		X(Q.16)		X		X(Q.25,26)	
Denmark	X	X			X	X		
Estonia	N.A.	N.A.			N.A.	N.A.		
Finland	X	X			X	X		
France	X	X			X	X		
Germany	X	X			X	X		
Greece	N.A.	N.A.			X		X(Q.27)	
Hungary	X	X			X	X		
Ireland	N.A.	N.A.			X	X		
Italy	X	X			X	X		
Liechtenstein				X				X
Luxembourg				X				X
Monaco	N.A.	N.A.			N.A.	N.A.		
Netherlands	X	X			X	X		
Norway	X	X			X	X		
Portugal	N.A.	N.A.			N.A.	N.A.		
Russian Federation	N.A.	N.A.			N.A.	N.A.		
Slovakia	N.A.	N.A.			X		X(Q.26,27)	
Slovenia	N.A.	N.A.						X
Spain	X		X(Q.11,14, 15,16,17)		X		X(Q.24,26,2 7)	
Sweden	X	X			X	X		
Switzerland	X		X(Q.16)		X		X(Q.25,26)	
Ukraine	N.A.	N.A.			N.A.	N.A.		
United Kingdom	X	X			X	X		
United States	N.A.	N.A.			N.A.	N.A.		
Yugoslavia	N.A.	N.A.			N.A.	N.A.		
European Community	N.A.	N.A.			X		X(Q.24,25,2 6,27)	

N.A. - Not applicable as not Party to the Protocol