



**Economic and Social
Council**

Distr.
GENERAL

EB.AIR/2000/1
21 September 2000

ORIGINAL : ENGLISH

ECONOMIC COMMISSION FOR EUROPE

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

Eighteenth session, Geneva, 28 November – 1 December 2000
Item 3 of the provisional agenda

DRAFT
2000 REVIEW OF STRATEGIES AND POLICIES
FOR AIR POLLUTION ABATEMENT

Draft report prepared by the secretariat

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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Introduction

1. There are 47 Parties to the Convention on Long-range Transboundary Air Pollution: 40 European countries, Canada, the United States of America and the European Community (EC). Since the publication of the previous Major Review, four more countries have become Parties to the Convention: Georgia on 11 February 1999, Monaco on 27 August 1999, Estonia on 7 March 2000 and Kyrgyzstan on 25 May 2000.

A. Activities within the framework of the Convention

2. This section is to be based on the introduction to the previous Major Review, published in 1999, and based on the 1998 questionnaire. Revisions to the section will take account of the changed emphasis of work and the new structure of the Convention and will make reference to the new mandates of the bodies under the Convention.

B. Mandate and aim of the review

3. By the terms of the Convention on Long-range Transboundary Air Pollution, the Contracting Parties shall, inter alia:

(a) "endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution" (article 2);

(b) "develop ... policies and strategies which shall serve as a means of combatting the discharge of air pollutants" (article 3);

(c) "exchange information on and review their policies ... aimed at combating ... the discharge of air pollutants" (article 4); and

(d) "exchange available information on national, subregional and regional policies and strategies for the control of sulphur compounds and other major air pollutants" (article 8 (g)).

4. The resolution on long-range transboundary air pollution adopted in 1979 at the High-level Meeting within the Framework of the ECE on the Protection of the Environment states that the Signatories to the Convention will seek to bring closer together their policies and strategies for combating air pollution including long-range transboundary air pollution (ECE/HLM.1, annex II).

5. The overall aims of this review of strategies and policies, as identified in the draft outline and questionnaire (EB.AIR/1999/3) agreed by the Executive Body at its seventeenth session in December 1999 (ECE/EB.AIR/68), are:

(a) To assess the progress made by the Parties and the region as a whole in meeting their obligations under the Convention and its protocols and to further their implementation; and

(b) To facilitate the exchange of information between Parties, which is foreseen in the Convention and its protocols.

The secretariat was charged with the preparation of the draft report both for review by the Implementation Committee and also for submission to the Executive Body for consideration at its eighteenth session in November 2000. This type of review of information will be one of the tools of the Implementation Committee to review compliance.

6. A large part of this draft review is based on the responses of the Parties to the 2000 questionnaire, which was sent to them in January 2000. Information on the responses from Parties is shown in table 1 below, with the dates replies were received by the secretariat. A complete report of the responses will be provided to the Executive Body and the Implementation Committee for information.

I. EMISSION LEVELS AND TRENDS IN THE EFFECTS OF TRANSBOUNDARY AIR POLLUTION

7. Emission data are to be based on information submitted by the Parties in response to the EMEP questionnaire sent in November 1999. These will be reported to the Steering Body for EMEP for approval at its twenty-fourth session in September 2000. Important aspects of relevant work of the Working Group on Effects will be included. This will draw upon the recent Report on Trends that summarizes some of the most recent findings from the International Cooperative Programmes together with other important information to be reported to the Working Group on Effects at its nineteenth session in August 2000.

II. PROGRESS REPORT BY THE PARTIES ON EACH PROTOCOL

7. The following sections summarize the responses to questions 1 to 71 of the 2000 questionnaire. The full replies are collated elsewhere (EB.AIR/2000/1/Add.1, Add.2, Add.3). The respondents, the dates of their submissions and the absence of responses to obligatory questions are listed in table 1. Responses are grouped under each Protocol, as proposed in the draft outline (EB.AIR/1999/3).

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

9. This section summarizes the answers received to question 1 of the questionnaire: As required by article 6 of the Protocol, provide information on your country's national strategies, policies and programmes that specifically address the reduction of sulphur emissions.

10. Responses to the question are mandatory for the Parties to the Protocol: Austria, Belarus, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Russian Federation, Slovakia, Sweden,

Switzerland, Ukraine. The names of the Parties that failed to provide a response to the secretariat are underlined. In addition to mandatory replies, responses were received from three other Parties to the Convention: Croatia, Poland and the Republic of Moldova (identified with * below).

11. In **Austria** licences are required for new or modified installations (Industrial Code and Clean Air Act for Steam Boilers). Emission limit values (ELVs) and/or Best Available Technology (BAT) are specified in the licences. Several categories of stationary sources have explicit ELVs and BAT set by ordinance. Limit values are set for the sulphur content of fuels. Emissions have fallen 88% from 1980 to 1998 (49% during 1990-1998).

12. In **Belarus** the Ambient Air Protection Act of 1997 and the Energy Saving Act of 1998 provide national, regional and industry-specific programmes for environmental protection. Various measures are provided by law, laying down standards for all kinds of energy-consuming equipment. Energy monitoring is compulsory for large installations. Sulphur emission controls include converting industrial, utility and domestic energy sources from coal and fuel oil to natural gas, reducing consumption of high-sulphur fuel oil, phasing out coal and using local fuels. To reduce sulphur emissions from mobile sources, the Mozyr oil refining plant is now producing diesel fuel with 0.03-0.04% sulphur. Petrol for motor vehicles contains no more than 0.05% sulphur. There are steps to convert mobile sources to compressed and liquefied natural gas fuels.

13. **Belgium.** See answer to question 18.

14. **Bulgaria** indicates a National Program (Government Decision 117/1985) which encompasses scientific research, development and investment, aimed at sulphur and nitrogen emission reductions. Despite political and economic changes three measures have been taken: producing sulphuric acid by heating pyrites was stopped; dual catalysis installations were introduced in sulphuric acid production for non-ferrous metal plant; the proportion of natural gas used for producing heat and electric energy was increased. Also due to decreasing production sulphur emissions dropped 31% between 1980 and 1993.

15. **Canada.** For SO₂, there is an eastern Canada cap (for the 7 provinces from Manitoba eastward) for 1994-2000; a permanent national cap and a cap in the sulphur oxides management area (SOMA) in southeastern Canada by 2000. The key policy measures used for the reduction of SO₂ emissions have been federal-provincial agreements in which the federal government set the SO₂ target (or limit) and the provinces either regulated or entered into voluntary agreements with emitters to achieve the required reductions (with most provinces choosing to adopt provincial regulations). Canada has also drawn up the Canada-Wide Acid Rain Strategy for Post-2000, signed by all provinces and territories and the federal government (1998), and Phase 3 of the Federal Smog Management Plan, for release in Summer, 2000.

16. **Croatia*** has not ratified the Protocol. See answer to question 18.

17. **Czech Republic.** The basic strategy and national policy for complying with the requirements of the Protocol were concerned primarily with a decrease in primary energy consumption, and achieving a decrease in solid fuels with high sulphur contents. Simultaneously,

there was an increase in the share of low-sulphur fuels, especially natural gas, and the production of electricity in nuclear power plants. In 1992, the requirement of the Protocol was met by a decrease of 31.9%.

18. **Denmark.** Stabilizing the total energy consumption, reinforcing combined heat and power and replacing coal- and oil-based production by renewable energy and natural gas are expected to reduce the emissions of sulphur. Four specific measures were introduced to reduce sulphur emissions (a sulphur tax, limit values for the sulphur content of fossil fuels and emissions from large combustion plants, a quota system for large combustion plants).

19. **Finland** made important structural changes in its industry and energy production in the 1970s and 1980s. In 1987, seven Council of State decisions on reducing sulphur emissions were made, according to the Air Pollution Control Act, covering the sulphur content of oil products, SO₂ emissions from new and major old coal-fired power plants and sulphur emissions from major industrial installations. With additional measures sulphur emissions fell 80% from 1980 to 1994.

20. **Germany.** Since the mid-1970s, Germany has adopted an active emission abatement policy based on state-of-art-emission reductions. Between 1980 and 1990 SO₂ emissions in the old federal *Länder* decreased by 70%. To achieve this, all large combustion plants were fitted with flue gas desulphurization technology. In addition, the sulphur content of fuels was reduced and use of low-sulphur fuels was required for installations where the use of flue gas treatment technology was not appropriate. With German unification the emission control regulations also became applicable in the new federal *Länder*. Emissions had decreased from 7514 kt in 1980 to 2945 kt by 1993.

21. In **Hungary** a Ministerial Decree entered into force in July 1998. It reflects the national policies and stipulates the ELVs for large combustion plant. A standard for the maximum sulphur content of gas-oil is annexed to the ministerial decree. A further Decree of the Minister for Economic Affairs controls the quality requirements of petrol and diesel fuel consistent with EU Directive 98/70/EC. The maximum sulphur content of gas-oil and petrol is 50 mg/kg.

22. **Italy's** policy to control and reduce sulphur emissions is inspired by the polluter-pays and user-pays principles, applied through a mix of command-and-control measures and economic instruments. Its programmes and measures are based on a regulatory framework: air quality standards, limit and target values for air concentration of sulphur, population attention and warning levels, emission limits for combustion plant and industrial installations, and fuel quality standards. Measures also include the promotion of renewable energy sources and energy saving, efficient use of energy resources in all end-use sectors, combustion plants and residential use of methane, and the combined use of sulphur with sulphur-free fuels in combustion plants.

23. **Netherlands.** The objective of the environmental policy is the pursuit of sustainable development, which has been apparent in all 3 environmental policy plans. New emission reduction targets are expected to emerge in 2000 after a review that is in progress. This review will also include the risk levels for sulphur. The emission reduction targets and risk levels for sulphur concentrations in ambient air, the emission standards and the emission limits are identical to those reported in the previous review.

24. **Norway.** The most important measures taken to abate sulphur emissions in the 1980-1993 period were the introduction of a sulphur tax, a limit on the content of sulphur in fuel oils and emission permits, which occasionally requires BAT. Norway regulated the sulphur content of fuels in 1985. Regulations were revised in 1995 and became compliant with the EU directive on the sulphur content of fuels. The Large Combustion Plant Directive (88/609/EEC) was implemented in 1988. A sulphur tax was used during 1980-93 as an economic instrument to abate sulphur emissions.
25. Although **Poland*** is not a Party to the Protocol, its SO₂ emission dropped by 35% between 1980 and 1993.
26. **Republic of Moldova*.** Air pollution prevention is covered by some of the laws that entered into force after the Republic of Moldova became independent. Information on these laws, the National Action Plans for Environmental Protection, the Environmental Performance Review, the National Plan of Activities for Health and economic instruments for the reduction of toxic substances is in the complete response made available to the Executive Body and the Implementation Committee. National emissions of all toxic substances, including SO_x, compared to the reference year decreased because of the economic and industrial decline, as well as through technological measures, improvements to installations and the use of cleaner fuels. Further action is planned.
27. **Russian Federation.** The Government of the USSR adopted Decision No. 896 of 01.08.1987 concerning the formulation of a "Long-term State programme on environmental protection and rational use of the natural resources of the USSR for the period covered by the thirteenth five-year plan and up to the year 2005". The programme (drafted in 1988) set out the main tasks of ministries whose enterprises contribute to emissions of sulphur compounds (ministries responsible for ferrous and non-ferrous metallurgy, the chemical and petrochemical industries, pulp and paper industry, power generation, construction materials, energy etc.). The main priority measures planned for reducing sulphur emissions were: conversion of large thermal power stations to gas; review of SO₂ emission standards for boiler plants of various capacities; and establishment of standards on the content of sulphur and sulphur-containing substances for solid, liquid and gaseous fuels.
28. **Slovakia.** The National Environment Policy (1993) sets long- and medium-term objectives for SO₂ reductions (80% and 50% respectively). These will be reached through several pieces of legislation. One act enables the Ministry of the Environment to set emission quotas which are expected to be in force in 2002. Another sets ELVs for different sources, fuels and technologies. A third stipulates fuel quality requirements, report keeping and the scope and methods of reporting to the air protection administration bodies, including the limit values of sulphur content in certain fuels.
29. **Sweden.** (Answer to questions 1 & 18.) There are 4 major tools to reduce SO_x emissions: the general energy policy to reduce the consumption of fossil fuels and the carbon dioxide tax; the sulphur tax on fuels; emission standards for major stationary sources; and environmental charges in the shipping sector.

30. **Switzerland.** In 1986 the Government adopted an overall Air Pollution Control Strategy covering SO₂, NO_x and VOCs. The target is to bring SO₂ emissions down to 1950 levels (i.e. a 60% reduction compared to 1980 levels). The 1985 Federal Law relating to the Protection of the Environment and its implementing ordinances, in particular the 1986 Ordinance on Air Pollution Control (OAPC) and the 1997 Ordinance on the incentive tax on “extra light” heating oil, set the legal framework for a comprehensive air pollution control programme. The 1986 OAPC (amended in 1992, 1997 and 1999) regulates (through emission standards) emissions from stationary sources; it also contains fuel and petrol requirements as well as effect-oriented ambient air quality standards. As regards pollution caused by motor vehicles, emission standards are laid down in the Ordinances relating to the Laws on Road Transport, Navigation and Aviation. Emissions (in kt SO₂) are for 1950: 46.2; 1980: 116; 1985: 75.9; 1990: 42.5; 1995: 34.3; 1998: 27.6.

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

31. This section summarizes the answers received to questions 2 to 8 of the questionnaire. Responses to the questions are mandatory for the Parties to the Protocols: Austria, Belarus, Bulgaria, Canada, Czech Republic, Denmark, 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. The names of Parties that failed to provide a response to the secretariat are underlined. Additional responses were received from 6 other Parties to the Convention: Belgium, Croatia, Georgia, Latvia, Lithuania and Poland (identified with* below).

1. National strategies, policies and programmes addressing the control and reduction of emissions (question 2)

32. **Austria.** The 1992 Ozone Law stipulates a reduction of NO_x emissions (70% between 1985 and 2006). As a consequence, 2 resolutions were adopted (1992, 1996) on the reduction of ozone precursors. The federal government was requested to implement a list of measures. The determination of ELVs and/or measures according to BAT is carried out in the licensing procedures for several categories of stationary sources. Since the introduction of national emission standards for cars in the 1980s, emission standards for vehicles have been improved and extended on the EU-level. NO_x emissions fell 22% between 1985 and 1998.

33. **Belarus.** The policies, national programmes and measures fully apply with regard to limiting and reducing emissions of nitrogen oxides primarily through the use of natural gas and local fuels and reducing the proportion of fuel oil and coal consumed. One of the main lines being followed is to build steam-gas plants and gas turbines.

34. **Belgium*.** With regard to large combustion installations, nitrogen oxide reduction targets have been set for existing installations (88/609/EEC), and limit values established for new installations. The electricity producers' obligations concerning nitrogen oxides have been laid down in a sectoral agreement (1991) with the governments of the regions. The **Flemish region** has its the

Flemish Environmental Policy Plan 1997-2001. Strategies (on acidification, photochemical pollution, eutrophication and climate change) have been worked into 9 specific actions. The Plan complements the classical approaches of the past (e.g. ELVs). The nitrogen oxide reduction policy of the **Walloon region** hinges primarily on the implementation of directive 84/360/EEC and the granting of operating permits which establish operating conditions and standards. There is also a sectoral agreement with glass manufacturers (1995). Air quality standards have been established by directive 85/203/EEC. The new directive 1999/30 sets maximum standards for 2010 which have been partially met. A general air quality plan is being drafted and will be finalized in 2002. In the **Brussels capital region** NO_x emissions have decreased (15% from 1990-1997). Work is under way on the preparation of an air pollution control plan, which should be finalized before the end of the year. For the **Federal Government** nitrogen oxide emissions control is part of the ozone plan (1996), which includes 14 measures (e.g. research and development, transport, energy). A new plan will be finalized in 2000.

35. **Bulgaria** has set up a National Programme, in compliance with Article 7, to limit nitrogen oxide emissions. In the past few years, Bulgaria has updated its nitrogen oxide emissions reduction strategy, which enabled it to sign the Gothenburg Protocol.

36. In **Canada** some responsibilities are national and some provincial. Recent programmes include the 1990 NO_x/VOC Management Plan adopted by federal and provincial ministers. Additional regional remedial measures were initiated in areas where the need for improvement in air quality was identified (see details under question 3). In November 1999, Canada-Wide Standards were agreed for particulate matter and ozone, as well as the development of implementation plans for meeting the standards. NO_x is also included in the Canada-Wide Acid Rain Strategy for Post-2000.

37. **Croatia*** provides details of its air pollutant emissions in the period 1990-1998, its policies, measures and strategies. The main instruments of the air quality protection policy are the Law on Air Quality Protection, the By-law on Limit Values of Pollutant Emissions from Stationary Sources and the By-law on Recommended and Limit Ambient Air Quality Values. Strategies include air quality standards and ELVs.

38. In the **Czech Republic** implementation of the Protocol is provided through Law No. 309/1991 Coll., on protection of the air against pollutants, as amended, and implementing Decree 117/1997 Coll., laying down emission limits and conditions for stationary pollution sources. The national policy for air pollution abatement is set out in the Concept of the National Environmental Protection Policy. A new document for national policy, the State Environmental Policy, was approved in 1999. The principal targets and measures for reducing NO_x emissions are lowering of NO_x emission standards for large power stations in compliance with EU requirements, and lowering specific NO_x emissions from mobile sources.

39. **Denmark.** The reduction of nitrogen oxides is a major goal of energy policy (through energy consumption and stationary sources). For mobile sources, catalytic converters on cars and emission standards (according to the EU directives) are implemented.

40. **Finland** prepared national strategies and policies in ad hoc committees. Regulations for some passenger cars came into force in 1990 (unleaded petrol). EU exhaust standards replaced domestic regulations in 1996. Emission standards for major power stations were set in 1991. Stationary source emissions have fallen by 30% since 1980, but mobile source decreases are smaller.

41. In **Germany** strategies and policies cover various stages of generation and many policy instruments. Air quality standards and emission controls for plants and products are important. All emission sources are subject to statutory requirements at source according to the state of the art. The establishment and operation of installations particularly liable to cause harmful effects on the environment are subject to licensing.

42. **Greece** reports 5 actions taken to reduce nitrogen oxides (EU standards for vehicle exhaust gas, encouraging use of less polluting fuels and renewable energy sources, reduction of energy losses from buildings, introduction of natural gas for energy, and action in Athens to cut traffic flow).

43. **Hungary**. Ministerial Decree 22/1998 (VI. 26.) KTM came into force in 1998. This piece of legislation reflects the national policies and stipulates the ELVs for large combustion plants.

44. **Ireland** describes in detail its national strategies, policies and programmes for stationary sources (i.e. legislation, voluntary agreements, technological measures) and mobile sources (i.e. vehicle emission standards, fuel quality, vehicle testing, budgetary measures, sustainable transport strategy, National Development Plan). It gives information on about the Air Quality Management Planning for Dublin and the work of the Environmental Protection Agency on EU Directives.

45. **Italy's** programmes and measures are based on a regulatory framework, e.g. air quality standards, limit values and target values for air concentrations, emission limits for combustion plants, emission standards for new vehicles. Also, programmes were developed in the sectors that are principally responsible for such emissions, that is the energy (e.g. renewable energy, efficiency) and transport (e.g. expansion of railways, paid parking in cities) sectors.

46. **Latvia***. Emission ceilings for nitrogen oxides for 2010 are 10% lower the 1990 emission level. Figures are included in annex II, table 2, of the Gothenbourg Protocol.

47. **Netherlands**. See question 1 for national strategies. New emission targets are expected to emerge in 2000 after a review which will include the risk levels for nitrogen oxides. The current risk levels for nitrogen oxides concentrations in ambient air, the emission standards and emission limits are identical to those in the previous review. Emissions decreased slightly between 1980 (588 kt) and 1995 (514 kt).

48. **Norway** describes NO_x emission charges in recent years. It gives information for stationary source controls: large (permits pursuant to Pollution Control Act of 1981, the Large Combustion Plant Directive, the EU Directives 96/61/EC, 80/779/EEC, 82/884/EEC and

85/203/EEC) and small (individual emission permits, but national regulations on the emissions from these plants are now finalized). For mobile sources it has emission standards (Road Traffic Act of 1965, EU directives) and taxes, and encouragement of electric vehicles. Review and analysis have suggested other measures including new gas turbines, catalytic cleansing on ships and increased freight efficiency. Funds are allocated to projects to encourage research and development.

49. **Poland***. The long-term objectives of the NO_x reduction policy are defined in the National programme for nitrogen emission reduction. Emission standards, unleaded petrol and BAT have been used. A gradual reduction in emissions NO_x is expected and Poland has met its major obligations in the Protocol. Research on monitoring, modelling and effects is carried out.

50. **Russian Federation**. Pursuant to the adoption of the Protocol, a plan of concrete measures was drawn up. Those included: an inventory of emissions for the European part of the USSR; formulation of specific targets to cut nitrogen oxide emissions for ministries (Energy, Ferrous Metallurgy, Building Materials, Timber and Paper Production, Transport) whose enterprises were major sources of such emissions. The targets were set out in the draft State programme on environmental protection and rational use of the natural resources of the USSR for the period covered by the thirteenth five-year plan and up to the year 2000. Priority measures have been set.

51. **Slovakia's** national objectives (in the National Environmental Policy for SO₂, NO_x, dust emissions, VOCs, POP, heavy metals, CO₂ and other greenhouse gas emissions) will be reached by means of several pieces of legislation (e.g. emission quotas for certain pollutants, ELVs for different type of sources, fuels and technologies).

52. **Spain** follows the policy of the EU and adopts policies and strategies according to the EU legislation and strategies.

53. **Sweden** lists 5 major tools to reduce Nox emissions: general energy policy to reduce consumption of fossil fuels; charges for emissions of NO_x from stationary sources; EU emission standards for on-road and off-road vehicles; environmental classification of fuels and vehicles.

54. **Switzerland** draws attention to its 1986 Air Pollution Control Strategy including nitrogen oxides (the minimum target is to reduce emissions to 1960 levels) and the 1986 Ordinance on Air Pollution Control, amended in 1992, 1997 and 1999. The latter regulates emissions from stationary sources. As regards pollution caused by motor vehicles, emission standards are laid down in the Ordinances relating to the Laws on Road Transport, Navigation and Aviation.

55. **Ukraine** has no special national programme, policy or strategy to implement the Protocol.

56. **United Kingdom**. Part 1 of the Environmental Protection Act 1990 (EPA90), supplemented by regulations, is the main legislative instrument for the control of air pollution (including NO_x) from industrial sources. Regulations under EPA90 prescribe industrial processes for which an authorization to operate is required from the relevant regulator. Conditions set out in

authorizations must be reviewed at least every four years. The arrangements will be continued under the pollution control regime to be set up under the Pollution and Prevention Control Act 1999, which will implement the EC Integrated Pollution Prevention and Control Directive (96/61/EC) and eventually supersede the 1990 Act regimes. Protocol obligations have been met.

57. **United States.** The national strategies and programmes are expressed in the specific pieces of environmental legislation that have been enacted, most importantly, the Clean Air Act and regulatory programmes authorized by that legislation. Specific programmes and EPA rules have been and are being implemented which continue to push for further emission reductions from mobile sources and the fuels used in them, to install best available control technologies on new and existing major stationary sources of NO_x, and to bring all areas of the country into compliance with the national ambient air quality standard (NAAQS) for ozone.

58. The **European Community** will soon finalize the Auto-Oil II Programme to provide a foundation for the transition towards longer-term air quality studies covering all emission sources. Both NO₂ and NO_x are among the pollutants selected for study.

2. Progress in applying national emission standards (question 3)

59. **Austria.** Major stationary source categories according to the technical annex of the Nox Protocol are “Commercial, institutional and residential combustion plants” and “Industrial combustion plants and processes with combustion”. For 19 new stationary sources categories (according to the size and the type of fuel) emission standards (and pollution control measures) have been set. For other industrial sources, individual emission standards and/or measures according to BAT have to be set in the licensing procedure for each installation.

60. **Belarus.** The major sources of NO_x emissions are divided into 4 categories. For boilers at thermal electric power stations and district heating plants, in the commercial and administrative sectors and at industrial facilities, the national standards are indicated according to the type of fuel and the size.

61. **Belgium*.** In the **Flemish region** there are different emission standards (and pollution control measures) for power plants/industrial combustion plants, oil refineries, non-combustion processes and waste combustion. In the **Walloon region** there are different standards (and pollution control measures) for the following large combustion installations: power stations, sugar refineries, iron and steel plants, chemical processing plants, wood pulp plants according to the type of fuel.

62. **Bulgaria.** Emission standards applicable to new stationary sources were adopted in 1993. In 1998, the regulation was replaced (by SG 51/98). National emission standards became mandatory for all stationary sources, following a positive environmental impact assessment, in 1998. From the beginning of 2000 emissions standards for large new combustion installations are in force (SG ISSN 73/99). The regulation has been harmonized with EEC Directive 88/609/EEC for large combustion plants.

63. **Canada.** National NO_x emission standards have been developed for the following major new stationary sources (effective dates in brackets): coal, oil and gas-fired electric utility boilers (revised standards effective January 1995), commercial/industrial boilers and process heaters (March 2000), cement kilns (March 2000), combustion turbines (November 1994). Provinces have implemented the guidelines for all new and substantially modified electric utility boilers commissioned since 1993.
64. **Croatia*.** Emission standards for NO_x are prescribed in the By-Law on LV Emissions for 5 sources categories. For new stationary sources they came into effect in 1998 and for existing stationary sources they will start in 2004.
65. **Czech Republic.** The categorization of sources and emission limits for NO_x set forth in Annex No. 2 and Annex No. 3 to Decree No. 117/1997 Coll. applies to new, significantly modified and existing stationary sources from 1 January 1999. Specific emission limits are laid down for selected large and medium-sized pollution sources, i.e. selected combustion installations and fuels, and for selected technological processes. A new law on the protection of the air and of the ozone layer is being prepared.
66. **Denmark** has national emission standards (and pollution control measures) for industrial plants and power plants >50 MW_{th}.
67. **Finland** provides a table of national emission standards for power generation.
68. **Germany** has submitted a table of national emission standards (and control measures) for power generation (according to the size and the type of fuel) and six industrial processes.
69. **Greece** notes that all of its large combustion plant is “existing plant” pursuant to Directive 88/609/EEC. Directive 96/61/EC (IPPC) will also be applied to all new large combustion plants from October 2000.
70. **Hungary** gives a table of national emissions standards for power plants and waste incinerators.
71. **Ireland** applies the EU Directive 88/609/EEC (major source category’s definition and ELVs). Integrated Pollution Control (IPC) licences are required and these will not be granted unless, *inter alia* Best Available Technology Not Entailing Excessive Costs (BATNEEC) is used.
72. **Italy** has implemented Directive 88/609/EEC regarding emissions from new large combustion plants. Regional authorities can impose more stringent standards. Italy has also introduced ELVs for new incineration plant.
73. **Latvia*.** Indicates three source categories (small, medium-sized and large plants) according to the type of fuel, their national emission standards and pollution control measures applied.

74. **Netherlands.** National emission standards (and pollution control measures) for NO_x are applied to new, substantially modified and for existing major stationary sources.
75. **Norway** identifies oil and gas extraction and industrial combustion and process industries as major source categories. Pollution control measures are determined for each plant in accordance with the Pollution Control Act 1981. They comply with the LCP and IPPC directives. Use of BAT is a requirement for new plants, where BAT is defined nationally or in an international framework (EU and OSPARCOM). Air quality limit values are applicable.
76. **Poland*** lays down emission standards for post-1990 major stationary combustion sources according to the size and the type of fuel, and has established control measures.
77. The **Russian Federation** applies national emission standards to certain new or substantially modernized stationary power generating plants (until 01.01.2001 and after 01.01.2001) according to the size and the type of fuel. The category of major stationary NO_x sources includes sources from which the annual mass of NO_x emissions is more than 500 t.
78. **Slovakia.** The source categories are defined in the Governmental Order Nr. 92/1996.
79. **Spain** applies EU legislation and strategies. See question 2.
80. **Sweden (also for Question 5)** has national emission standards for new and existing plants, >500 MWth and for boilers above 10 MW but below 500 MW.
81. **Switzerland** considers “commercial, institutional and residential combustion plants” as major stationary source categories. It has a general emission standard and four source category standards according to size and type of fuel.
82. **Ukraine** applies national emission standards for six stationary source categories (and pollution control measures). Plans are being made to establish technical standards in 2002 for emission sources using BAT.
83. The **United Kingdom** identifies power plants as the major stationary source category. Emission standards for new large combustion plant have been set as required under the Large Combustion Plant Directive (88/609/EC). In future, NO_x emissions from new power plants will be controlled through the pollution control regime to be set up under the Pollution Prevention and Control Act 1999, which will implement the EC IPPC Directive.
84. **United States.** The CAA requires new source performance standards (NSPS) or emission limit standards for major industrial sources of several pollutants including NO_x. The NSPS are technology-based emission standards based on best demonstrated technology for a particular source category or process that is economically feasible. NSPS have been established for over 60 categories of major sources. Six of them address NO_x.
85. **European Community.** For major stationary sources and all kinds of pollutants, Council

Directive 96/61/EC (IPPC Directive) is its key pollution control instrument on Community level. The source categories covered are listed in Annex I to the Directive. The instrument entered into effect in September 1999 and covers new installations and existing ones (with a transition period until 2007 for compliance). Applying this Directive will meet the provisions of the NO_x Protocol.

3. Progress made in applying national emission standards to new mobile sources (question 4)

86. **Austria** identifies passenger cars and heavy-duty vehicles as major mobile source categories. Emission standards for mobile sources are applied according to EC legislation.

87. **Belarus** has national standards for NO_x emissions relating to four mobile source categories. Emission standards have not yet been established for new mobile sources. An inter-agency commission has been set up to make proposals in 2000 for the phased application of EU environmental standards to vehicles produced in Belarus.

88. **Belgium***. **Federal Government:** EU emissions standards are applied to new mobile sources.

89. **Bulgaria.** Bus and truck diesel engines must meet EURO I and EURO II requirements. Bulgaria has a new road traffic law (SG ISSN 20/99) ratifying by law the Agreement for adopting unified technical recommendations for vehicles, equipment and spares (Geneva, 1958). A regulation determining the terms and conditions for standards approval and the establishment of a national laboratory will be adopted soon.

90. **Canada** provides a table of national NO_x emission standards (and pollution control measures), according to the type of fuel, for four mobile source categories. New standards are in line with the United States EPA federal programme, effective with the 1998 model year.

91. **Croatia*** has a regulation prohibiting the import of vehicles without catalysers (effective from 1 October 1999), vehicle emissions standards (exhaust gases and noise), provisions for periodic vehicle inspections (exhaust emissions safety and fuel quality standards).

92. In **the Czech Republic** road vehicles and non-road mobile sources are major source categories. It applies emission limits to motor vehicles following the UN/ECE regulations (UNECE 49/1982 and 83/1990). Emission standards for off-road vehicles will be implemented by the end of 2002. All vehicles new to the Czech Republic must comply with UN/ECE regulations 49/1982, 83/1990 and 96/1996. Measurement of NO_x or the sum of HC + NO_x is part of the emission measurements required by these regulations.

93. **Denmark** applies EU directives (98/69, 91/542, 97/68, 97/24) for four mobile source categories and the EU Directive 1999/52 (92/55).

94. **Finland.** The emission standards applied to the mobile source categories identified are those of EU (EURO II and III). Finland has also implemented EU Directive 97/68/EC.

95. **Germany** applies the ELVs for NO_x and HC imposed in the EU on passenger cars, light and heavy duty vehicles, motorcycles and other vehicles (EURO II and III).
96. **Greece.** The new mobile source categories that are considered to be major source categories under the Protocol are: road vehicles and other mobile sources (agriculture and shipping). All provisions of EU legislation concerning emission standards and exhaust gases are applied.
97. **Hungary.** The licensing procedure and emission standards of road vehicles are in full compliance with UN/ECE regulations. There are approval requirements for different vehicle types. Vehicles can be put into operation only if they meet these requirements.
98. **Ireland** has transposed into national law all EU vehicle emission standards and is finalizing the transposition of the EU Auto Oil Programme directives.
99. **Italy.** New vehicles have to meet emission standards set in EC directives. Requirements for type-approval and conformity of production of motor vehicles must be satisfied for registration, sale and entry into service of any motor vehicle.
100. **Lithuania*.** Draft standards on NO_x emissions for mobile sources according to the requirements of the EC directives are under preparation.
101. **Netherlands.** There have been no changes in national emission standards for new mobile sources since the previous review. The Dutch legislation on national emission standards for new mobile sources follows that of the EU.
102. **Norway.** The largest mobile source categories are shipping traffic and road traffic. On-road vehicles must fulfil the emission standards in pursuance of the Road Traffic Act of 1965. A series of vehicle emission standards have been implemented: US-83 vehicle emission standards for petrol-fuelled passenger cars (1989), US-97 and US-90 vehicle emission standards for petrol and diesel vehicles (1991 & 1992). Since 1993, regulations on vehicles have complied with the corresponding EU directives.
103. **Poland*.** Road transport is the second major source of anthropogenic NO_x emission. Sets of decrees regulate the use of vehicles on the road. The Act on Road Traffic requires emissions to meet UN/ECE Regulations No. 49 and No. 83.
104. **Russian Federation.** Three new standards were developed in 1995 to reduce environmental stress in towns and cities by making wider use of natural gas in the transport sector. The mobile source categories are light passengers vehicles, trucks, buses and coaches. There are no standards for NO_x.
105. **Slovakia.** New mobile sources have to comply with the UN/ECE regulations 9, 24, 40, 41, 47, 49, 51, 63, 83, and 96, concerning the emissions. Slovakia also has emission limits (for CO and HC) for cars equipped with an ignition engine without catalytic converters. Those cars are tested every 12 months.

106. **Spain** follows the EU legislation and strategies. See answer to question 2.
107. **Sweden.** Emission standards for new mobile sources NO_x and VOC are in compliance with the EU regulations.
108. **Switzerland** considers road transport and other mobile sources and machinery as major source categories. Switzerland has four mobile source categories with emission standards which are/will be similar to the EU Directives.
109. **Ukraine** provides a table on the application of national emissions standards for four mobile source categories.
110. The **United Kingdom** identifies road transport as a major mobile source category. It applies emission standards for cars (Directive 94/12/EC), light vans (Directive 96/69/EC), also Heavy Diesel Emissions Directive (Euro 2) (91/542/EC) and Directive 97/68/EC. From 1993 all new petrol-driven cars must have catalytic converters fitted. Fuel standards are in line with those laid down in EC Directive 93/12 and European Norms EN228: 1995 for petrol and EN590: 1997 for diesel.
111. The **United States** has had emission control standards for motor vehicles since 1968. Recent actions include those on additional categories of mobile equipment, light-duty vehicles, on fuel evaporation from the vehicle or when a vehicle is refuelled, NO_x emission controls for new diesel truck and bus engines. A federal law requires cities with the worst ozone problems to begin using cleaner reformulated petrol, vehicle inspection and maintenance programmes, motor vehicle standards (passengers cars and light trucks), and engine standards (for heavy-duty engines used in trucks and buses, as well as engines used in non-road applications).
112. **European Community.** A number of technical requirements aimed at reducing emissions from road transport are in EC legislation. They fall into 4 groups: quality of petrol and diesel fuels (Directive 98/70/EC), emission standards for light-duty vehicles (Directive 70/220/EEC, 98/69/EC and 1999/102/EC), emission standards for heavy-duty vehicles (Directive 88/77/EEC, 1999/96/EC), emission standards for two- or three-wheeled vehicles (Directive 97/24/EC). Work is continuing on updating and completing these sectoral requirements.

4. Progress made in introducing pollution control measures for the existing sources in the major stationary source categories (question 5)

113. **Austria.** Major stationary source categories – see question 3. Austria has emission standards for 18 stationary source categories.
114. **Belarus.** Flue gas recycling and multi-stage combustion are used to limit NO_x emissions from existing sources in power generation, industry and the utilities sector. They are applied to large plant and will be applied to smaller plant from 2010. A catalytic process is being used for nitric acid production in Grodno. One means of reducing NO_x emissions by 2010 will be to use

wood as a major fuel. Steam-gas turbines, wind-power units and small hydropower plants are expected to contribute to power generation in 2010.

115. **Belgium***. **Walloon region:** for installations whose operating permit was granted after 1 July 1987, see question 3. The standards (mainly according to the type of fuel) apply only to five source categories in operation before 1 July 1987. **Flemish region:** for existing installations (authorized before 01/01/93), the same ELVs as for new installations are applicable (from 01/01/99). A period of transition is foreseen for some sectors (e.g. production of nitric acid on 01/01/2003). For power plants and industrial combustion plants, the regulation is according to the type of fuel and the date of the authorization.

116. **Bulgaria.** NO_x emission standards for existing stationary sources (combustion plant) are identical to emission standards for new stationary sources. The Clean Air Act adopted in 1996 foresees some exceptions.

117. **Canada.** Ontario develops emission regulations for existing coal- and oil-fired electric utility boilers and proposes a standard on electricity output and the use of an emission cap. British Columbia has placed stringent NO_x control standards on a 900 MW gas-fired generating station.

118. **Croatia*.** See question 18, under “Cleaner technologies”.

119. **Czech Republic.** In the framework of the Environmental Programme of the Czech Power Company, denitrification techniques were installed in 1994-1998. Actions have also been taken for the production of construction materials and cement.

120. **Denmark.** The emissions of NO_x from all stationary sources with an electrical output of more than 25 MW including existing sources are regulated through a quota system. The quota system states the yearly limit for emissions. The limit has been reduced from 106,000 tons (1992) to 35,000 tons (2003).

121. **Finland.** The licencing procedure, where the BAT principle is applied, is used in fixing the emission limit values for stationary sources. In addition, guidelines for existing power stations greater than 100 megawatts were implemented after 1991

122. **Germany.** Existing stationary sources are in compliance with the technical annex to the Protocol. For specific emission limit values, see question 3. After a transition period (5 years), the same requirements apply to new and existing installations.

123. **Greece.** Conventional thermal plants, co-generation plants and industrial processes are the only major source categories under the Protocol. Every large combustion plant is existing plant under Directive 88/609/EEC which is applied. For industrial processes, a limit value has been set for plants producing nitric acid. Directive 96/61/EC (IPPC) will be applied from 2007.

124. **Hungary** lists ELVs of NO_x which may not be exceeded after 01.01 2001 (the authorities can permit longer deadline up to 31.10.2007) for the glass industry, the cement industry, the

burning of lime-stone, bauxite in rotary kiln, in other kiln, the production of lime, stationary diesel engine.

125. **Ireland** has extended of the national IPC and IPPC licensing system to existing LCPs. This, together with EU legislation requiring a maximum 1% sulphur HFO from 2003 and the increasing use of combined cycle gas turbines and renewable energy sources, will ensure both SO₂ and NO_x emissions are significantly reduced in the coming years.

126. **Italy.** The Ministerial Decree of 12 July 1990 which established ELVs for all existing plant. These must satisfy the standards no later than 31.12.1997 (31.12.2002 for large combustion plants). The Ministerial Decree of 19 November 1997 modified ELVs for existing incineration plants. Furthermore, national glass industries signed a voluntary agreement to introduce measures to reduce NO_x emissions from glass production by 50% (1998 – 2002).

127. **Latvia*** will introduce regulations for new combustion plants in 2000 and for existing combustion plants in 2006. Regulations apply to combustion equipment in energy and industrial sectors and to waste combustion. Regulations specify emission standards for sulphur and NO_x for different fuel types for small, medium-sized and large plants, and provide principles for licensing, monitoring, control, and terms for BAT options.

128. **Lithuania*** has a national methodology which mostly complies with the Protocol.

129. **Netherlands.** There are no changes from the data given in the previous review.

130. **Norway.** Major stationary sources: see response to question 3. The Norwegian Pollution Control Authority issues emission permits on a plant-by-plant basis to stationary sources. They are in accordance with the Pollution Control Act and comply with the EU regulatory framework (LCP, IPPC, air quality, hazardous waste directives).

131. **Poland*** has emission standards for existing major stationary combustion (launched before 28 March 1990) according to the type of fuel and the thermal power and indicates 4 pollution control measures applied.

132. **Russian Federation.** Evaluating progress made in introducing nitrogen oxide control measures for existing major stationary sources is practically impossible because of the contraction of production since 1990. The reduction in emissions for the European part of the Russian Federation was 6.2% in 1998 compared to 1987.

133. **Slovakia.** Legislation does not prescribe specific measures for reducing NO_x emissions. However, the 1999 amendment of the Act on Air and the approval of the new Act on Fees for Air Pollution have introduced categories for basic pollutants. This is intended to be an economic incentive for operators to plan investment and cut emissions. Through the Act on Air new installations must apply BATNEEC.

134. **Spain** follows the EU legislation and strategies. See answer to question 2.

135. **Sweden.** See answer to question 3.
136. **Switzerland.** The major stationary source categories are listed under question 3. Emission standards also apply to existing plants. Existing plants must be retro-fitted within five years after the entry into force of ELVs.
137. **Ukraine.** Technical solutions are continuously being introduced in the major stationary source category to reduce emissions of NO_x. These involve introducing new combustion technologies and modifying processes and combustion.
138. **United Kingdom** identifies power plants as major stationary source categories. The targets of Directive 88/609/EC have been met. Emission standards for processes regulated under Part 1 of the Environmental Protection Act are set on a process- and site-specific basis. Operators of these processes are required to employ BATNEEC. In future, NO_x emissions from existing power plants will be controlled through the pollution control regime to be set up under the Pollution Prevention and Control Act 1999, which will implement the EC IPPC Directive.
139. **United States.** Refer to question 2. For existing stationary sources the United States programme is based on achieving the mandatory NAAQS for ozone. Great success has been achieved in balancing economic growth and environmental protection by allowing States and cities to choose the most cost-effective strategies to address the existing sources and by not mandating the same level of control on major existing sources as for new sources.
140. **European Community.** See answer to question 3.
5. **Progress made in making unleaded petrol available. Has your country phased out the use of leaded petrol for on-road vehicles? (Question 6)**
141. **Austria.** Leaded petrol has been banned since 1 November 1993.
142. **Belarus.** Leaded petrol production stopped in 1998. Leaded petrol was phased out in 1999.
143. **Belgium*. Federal Government:** marketing of leaded petrol has been prohibited since 1 January 2000 (Directive 98/70/EC).
144. **Bulgaria** produces leaded petrol and has sufficient available capacity to produce methyl tertiary butyl ether (MTBE). The petrol production structure in Bulgaria (1990-1996) in thousand tonnes is

| Petrol type | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|---------------|--------|--------|--------|--------|--------|--------|-------|
| Leaded petrol | 1341.8 | 1056.7 | 1131.3 | 1404.4 | 1144.3 | 1088.1 | 918.9 |
| Unleaded | | | | | | | |

| | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| petrol | 4.4 | 8.5 | 0.7 | 348.8 | 304.7 | 368.6 | 322.0 |
| Total | 1346.8 | 1065.2 | 1132.0 | 1753.2 | 1449.0 | 1456.7 | 1240.9 |

Unleaded petrol production increased from 0.3% in 1990 to about 26% in 1996. By Government Decision 173/98 a National Programme was adopted for the phase-out of leaded petrol production and use, the deadline for the complete phase-out being 31 December 2003. 80-85% of the unleaded petrol produced in the country is exported, domestic consumption being 6-10%. All fuel stations are stocked with sufficient quantities of unleaded petrol.

145. **Canada.** Lead additives in petrol for on-road vehicles were banned in December 1990. Lead additives are allowed in aviation gasoline and competitive racing fuels.

146. **Croatia*.** Leaded petrol will be phased out in 2005. Since 1992, all petrol stations have offered unleaded petrol with different pump nozzles for leaded and unleaded petrol. The market share of unleaded petrol increased from 2.5% in 1990 to 30% in 1996, while the consumption of leaded petrol has remained almost constant in recent years.

147. **Czech Republic.** Leaded petrol has not yet been taken out of use for on-road vehicles. Decree No. 244/1999 Coll. terminates the sale of leaded petrol on 1 January 2001. The market share of unleaded petrol increased from 62.5% in 1997 to 70.4% in 1999.

148. **Denmark.** Leaded petrol has been banned since 1994.

149. **Finland.** Leaded petrol has been banned.

150. **Germany.** Leaded petrol has been voluntarily phased out by the producers. The remaining amounts of leaded petrol are imports, with a market share below 0.01% in 1998. Lead replacement additives are sold to the end user.

151. **Georgia*** has been working on the preparation of a programme which aims to phase out lead by 2005. Ninety five per cent of all petrol is imported from Azerbaijan, Bulgaria, Greece, Romania, Turkey, the Russian Federation and Italy. Fifty per cent of the total amount is imported illegally and it is very difficult to identify the share of leaded and unleaded petrol.

152. **Greece** is expected to phase out leaded petrol by 31 December 2001 (Directive 98/70/EC). Unleaded petrol is available, particularly along the main international transit routes. The percentages of total sales of leaded and unleaded petrol are 55% and 45% respectively.

153. **Hungary.** Ministerial Decree 12/1998 banned leaded petrol on 1 April 1999.

154. **Ireland.** Leaded petrol has been banned since 1 January 2000 as required by EU Directive 98/70/EC.

155. **Italy** will phase out the use of leaded petrol in 2002. The market share of unleaded petrol

is about 62%. Unleaded petrol is available along all transit routes.

156. **Latvia***. The Regulations on Fuel Quality Standards for the Environment, approved in 1998, include the requirements of Council Directives 85/210/EEC, 87/416/EEC and 93/12/EEC. Draft regulations on fuel quality standards are expected to be approved in 2000. These include the requirements of Council Directive 93/12/EEC, amendment 1999/32/EC and Directive 98/70/EC of the EU. The amount of unleaded petrol will be 99.5% of the total. No date has been set for the phase-out of the remaining 0.5%.

157. **Lithuania*** banned the use of leaded petrol and diesel fuel with a sulphur content exceeding 0.05 % in 1998.

158. **Netherlands**. Leaded fuel has been phased out.

159. **Norway**. Since 1997 no leaded petrol has been sold.

160. **Poland***. Lead-free fuel is widely available. Lead-free petrol consumption in 1999 was 78% of total petrol use. The Government signed the declaration proposed by Denmark to withdraw petrol containing lead from the market by 2005.

161. **Russian Federation**. Statistics on the consumption of leaded and unleaded petrol are not available. Only unleaded petrol is used in the major cities and served at filling stations located along international highways. Government Decision No. 263 (06.03.1996) approved a target-oriented "Fuel and energy" programme which includes a subprogramme "Reconstruction and modernization of oil-refining enterprises". The programme covers the period until 2000 and provides for an increase of up to 65% in the production of unleaded petrol. A number of regional programmes have been drawn up to deal with issues relating to the prevention of environmental lead pollution.

162. **Slovakia**. Since 1998 only unleaded petrol has been produced, imported and marketed. (Regulation Nr. 268/1997 on fuel requirements.)

163. **Spain** has phased out leaded petrol in line with EU legislation.

164. **Sweden**. Leaded petrol has been phased out.

165. **Switzerland** phased out the use of leaded petrol for on-road vehicles by 1 January 2000.

166. **Ukraine**. A programme to phase out leaded petrol is being implemented. Leaded petrol accounted for 5% of the total in 1999. Leaded petrol will be phased out by the year 2005.

167. **United Kingdom**. Unleaded fuel is widely available at refuelling stations throughout the

country. The United Kingdom phased out leaded petrol by 1 January (EC Directive Auto-Oil II). Leaded petrol for use in light aircraft is still legal.

168. **United States.** Leaded petrol has been phased out.

169. **European Community.** Leaded petrol is phased out in the fifteen member states with the following exceptions: Spain, Greece and Italy can continue to market leaded petrol until 31 December 2001. France may also do so in its Overseas Departments until 31 December 2004.

6. Measures taken to facilitate the exchange of technology related to the reduction and control of emissions of nitrogen oxides. (Question 7)

170. **Austria.** Information can be found in question 25.

171. **Belarus** cooperates with France.

172. **Belgium*.** At the international level the 3 regions participate in the EU IMPEL network in the drafting of BAT reference documents (EU IPPC Directive). A 'Mixed Platform' was created (1998) for consultation and dissemination of information between the government and industry concerning the Belgian position on international environmental topics. **Walloon region.** There is a "clean technologies" service in the environment authority and a technology observatory at the Public Service Scientific Institute. They are responsible for collecting and disseminating information on BATs. In the **Flemish region** there are Centre for BATs (1994), the Energy and Environment Information System and the centre of expertise Rational Use of Energy. In the **Brussels capital region** two departments at the Brussels Institute for Environmental Management have among their tasks the dissemination of information to enterprises. There are also the ECOBRU facility and the organization Technopole.

173. **Bulgaria.** The exchange of technologies is carried out by the Chamber of Commerce, on company level. Bulgaria has signed bilateral agreements for cooperation in the sphere of environment preservation with Denmark, the Netherlands and Germany and the PHARE/EEC programme.

174. **Canada.** The measures taken to facilitate the exchange of technology information with respect to reducing emissions of nitrogen oxides have been focused on Internet-accessible information. Technology information exchange is also accomplished through events. Information is also available in hard copy upon request through Government publications.

175. **Czech Republic.** The privatization of cement plants was carried out through the action of a foreign partner who invested in the reconstruction of production lines.

176. **Denmark.** Since 1991 Denmark has operated an environmental assistance programme to countries in transition. However, only a few of the projects have been targeted towards NOx reductions only.

177. **Finland** has supported environmental protection in Finland's neighbouring areas since 1991 through bilateral and multilateral cooperation projects. Finland has given expertise to a EU twinning project to improve Estonia's air pollution control legislation.
178. **Germany** draws attention to the internet system "Cleaner Production Germany" (www.cleaner-production.de), which provides information on projects of clean production and pollution prevention and control. It also has a transform-programme (technical assistance) and a twinning programme.
179. **Greece** (authorities and enterprises) is participating in the Community's work on defining BAT in a number of sectors of industry.
180. **Ireland.** The Electricity Supply Board participates in the international technical bodies (Eurelectric, VGB) seeking, *inter alia*, to improve knowledge of emission abatement techniques, increased use of renewable fuels, etc. In addition, the Board has participated in two EU-funded Thermie projects exploring NOx reduction techniques.
181. **Italy** supports a number of activities to facilitate access to technologies through bilateral and multilateral cooperation mainly related to the energy sector. Through many trust funds and international financing organizations, Italy co-finances projects on clean technologies and energy saving. Law 212/92 instituted a fund for bilateral assistance to eastern European countries and for projects related to technical and professional assistance and some environmental aspects. Italy contributes to the PHARE and TACIS programmes. A number of specialized Italian research institutions provide direct assistance in Italian laboratories, specialised training and workshops, with particular regard to energy-saving technologies.
182. **Latvia*.** The Division of Laboratory of the Environmental Data Centre of Latvia ensures the quality of emission control data according to the requirements of international standards for emission measurements of major stationary sources of pollution: ISO 10396, LVS ISO 9096, ISO 11564.
183. **Netherlands.** The Ministry Housing, Spatial Planning and the Environment has given the consultant agency, "Infomil", the assignment to provide information, especially to companies, about permitting and the as-low-as-reasonably-achievable (ALARA)/BAT to reduce certain emissions, including NOx. For the Inter-governmental Panel on Climate Change, the Netherlands made integrated documents on BAT for iron and steel, cement, paper and pulp, aluminium and zinc, glass, chloralkaline, nitric acid, oil refineries, phosphoric acid and air pollution abatement in general.
184. **Norway** has supported cleaner production programmes in several countries. Norway has given high priority to bilateral and multilateral environmental cooperation with countries in central and eastern Europe (agreements). In addition, Norway is financing projects in the Baltic States. Under the United Nations Framework Convention Climate Change, several projects have been initiated under the pilot phase for joint implementation.

185. **Poland*** indicates the activities undertaken under the Technical and Technological Agency. Funding is made available for the development and support of the transfer of environmentally sound technologies. Poland participates in the EURECA programme, SPRINT and BRITE programmes and projects of EKOFUNDUSZ.
186. **Russian Federation.** The Russian Federation and Sweden have signed an agreement (26 April 1999) on cooperation in the field of energy efficiency and renewable sources of energy.
187. **Slovakia.** No special measures are introduced for that purpose.
188. **Spain** follows the EU legislation and strategies. See answer to question 2.
189. **Sweden** is active in assisting the St. Petersburg area, the Baltic countries and Poland. Important areas have been energy saving, district heating, boiler technology and conversion from fossil to biomass fuels. In the joint projects both technology improvements and training programmes are included. Sweden is helping to maintain and improve EMEP stations and city air monitoring equipment in the Russian Federation and the Baltic countries.
190. **Switzerland.** No special activity at the governmental level, rather on a commercial and consultancy basis.
191. The **United Kingdom** provides bilateral technical assistance for environmental projects to countries in transition through the Environmental Know How Fund.
192. **United States.** Efforts to facilitate the exchange of information regarding technologies used to control NO_x are made via professional associations, meetings/conferences and journals, Web sites and listservs.
193. **European Community.** The information exchange established under the Directive mentioned in the answer to question 3 can also be considered as a measure to facilitate the exchange of technology.

7. **Progress made in establishing critical loads. Have you provided critical loads data to the UN/ECE Working Group on Effects as part of its Mapping Programme? (Question 8)**

194. **Austria.** Critical loads for acidification (forest soils) and for eutrophication (three ecosystems) have been established with a spatial resolution of 2.75 km x 2.75 km. The methodology used is mainly based on the recommendations in the UN/ECE Mapping Manual. The data were transmitted to the Coordination Center for Effects (CCE).
195. **Belarus.** Critical loads for the EMEP 50 km x 50 km grid were defined in 1998.

196. **Belgium***. **Walloon region:** data on critical loads have been sent to UN/ECE as from 1998 for the years 1996 and 1997. **Flemish region:** In 1996 a study was completed in which critical loads were determined for 652 points in forests in Flanders. This study was conducted according to the methods in the 'CCE status report 1993'. The information was presented to the Working Group on Effects. A study (to end in August 2001) has started to construct sensitivity maps for acidification and eutrophication as well as critical load exceedances in Flanders.

197. **Bulgaria** has been providing information and critical loads data to the UN/ECE Working Group on Effects since 1997.

198. **Canada** is not part of the EMEP geographical domain and thus has not provided critical loads data to the Mapping Programme. However, it published a critical loads map in the 1990 Canadian Long-Range Transport of Air Pollutants and Acid Deposition Assessment Report. In the 1997 Canadian Acid Rain Assessment a map of critical (sulphur + nitrogen) loads was published. This map is being revised (within the next three years) using a larger data set.

199. **Croatia*** has provided critical loads data to UN/ECE. In 1998, critical loads were calculated and mapped for the area of Gorski Kotar. The mapping of part of north-western Croatia will soon be completed. For other areas of Croatia critical loads still have to be determined.

200. **Czech Republic.** Data on critical loads for sulphur and nitrogen have been provided to the UN/ECE Working Group on Effects. Critical loads of certain heavy metals are calculated using a semi-dynamic approach (adsorption and complexation processes are included in the model).

201. **Denmark** has provided data on critical loads to the UN/ECE Working Group on Effects. The latest official updating was in 1997.

202. **Finland** has provided data to CCE. The latest update, following a request from CCE, was in 1999 (see CCE Status Report 1999 for details). The data have been used nationally and for international projects.

203. **Germany** is the lead country of the Mapping Programme. Data have regularly been updated according to scientific knowledge and availability of input data.

204. **Greece** has provided data on annual emissions from all anthropogenic sources for the 1985-1998 period.

205. **Hungary** provides critical loads data of nitrogen and sulphur (50 km x 50 km grid) to the Working Group on Effects. It plans to produce critical loads maps of finer resolution.

206. **Ireland** provides data to the UN/ECE Working Group on Effects for its Mapping Programme of critical loads for acidity, sulphur and nitrogen for various Irish terrestrial receptors according to international guidelines and methodologies. The Irish National Focal Centre for mapping critical loads will continue to deal with any queries arising from submissions to CCE.

207. **Italy.** The National Focal Centre for mapping of critical loads and levels was established in 1995. It develops maps of total acidity, maximum critical loads for sulphur, minimum critical loads for nitrogen, maximum critical loads for acidifying nitrogen, critical loads for nutrient nitrogen. All the data were submitted to CCE and the contribution to the Mapping Programme was reported in the 1997 and 1999 status reports of CCE.
208. **Latvia*.** 1 LVS ISO 7934:1989.
209. **Lithuania*.** Critical loads of nitrogen and sulphur compounds have been mapped for Lithuanian ecosystems, using recent calculation methods. Exceedance maps have also been produced for national investigations.
210. **Netherlands** sponsors CCE, the scientific centre under the ICP Modelling and Mapping. It has provided CCE with national critical load data for acid deposition and nitrogen deposition whenever there have been official calls for data. The Netherlands is working on updated national critical loads in relation to the evaluation of the emission targets and environmental quality objectives. Also, the Netherlands is working on producing critical loads based on dynamic modelling and biodiversity.
211. **Norway.** The National Focal Centre was established in NIVA in 1989, and first critical loads (for waters) were estimated in 1991. Critical loads for soils were reported in 1993-94 and critical loads for vegetation in 1996. Norway has regularly reported critical loads to the Mapping Programme of the UN/ECE Working Group on Effects. The latest submission took place in January 1999.
212. **Poland*** has contributed to the Mapping Programme since 1990, regularly submitting to the UN/ECE Working Group on Effects databases and maps of critical loads of acidity and, since 1995, critical loads of eutrophication. The latest update of maps was carried out in spring 2000.
213. **The Russian Federation** is making changes regarding the establishment of critical loads.
214. **Slovakia** has not established critical loads for NO_x and has no programme for doing so.
215. **Spain** follows EU legislation and strategies. See answer to question 2.
216. **Sweden** has provided critical loads data to the Mapping Programme.
217. **Switzerland.** Information on critical loads determination available from the CCE status reports and from special publications of the Swiss Agency for the Environment, Forests and Landscape (SAEFL).
218. **Ukraine** has not provided critical loads data to the UN/ECE Working Group on Effects.
219. **The United Kingdom** continues to make progress in establishing critical loads (acidity critical loads, critical loads for nutrient nitrogen, etc.). National critical loads data were last

submitted to the Coordination Center for Effects in January 1998 for use by the Mapping Programme under the UN/ECE Working Group on Effects. Many publications have resulted from the work.

220. **The United States** is outside the geographic region of the Mapping Programme and, therefore, has not provided critical loads information to the Working Group on Effects. However, the United States has established critical levels for ozone, as well as nitrogen dioxide and particulate matter, in the form of National Ambient Air Quality Standards (NAAQS). Under the Clean Air Act, the NAAQS are required to be reviewed every 5 years and updated based on the latest scientific information.

221. **European Community.** Critical loads are not yet established in Community legislation. Upcoming legislation will take account of critical loads. As the EC operates no monitoring network on its own, no data were reported.

Table 1.
2000 Questionnaire for the Review of Strategies and Policies :
received replies

| PARTY | DATE ¹ | COMMENT |
|-----------------------|-------------------|--|
| Armenia | 05.04.00 | e-mailed |
| Austria | 10.04.00 | e-mailed |
| | 20.04.00 | Mailed |
| | 20.07.00 | e-mailed: reply to question 24. |
| Belarus | 27.03.00 | Mailed |
| Belgium | 26.05.00 | e-mailed |
| | 02.06.00 | e-mailed: replies to POPs & HMs Protocols. |
| Bulgaria | 12.04.00 | e-mailed |
| Canada | 07.04.00 | e-mailed |
| | 27.04.00 | e-mailed: replies to VOC protocol. |
| Croatia | 11.07.00 | e-mailed: a promise to submit questionnaire. |
| | 27.07.00 | e-mailed: questionnaire from question 1 to 27. |
| | 28.07.00 | e-mailed: questionnaire from question 28 to 71. |
| | 17.08.00 | Mailed: official submission. |
| Cyprus | 30.03.00 | e-mailed |
| Czech Republic | 10.04.00 | e-mailed |
| Denmark | 18.05.00 | e-mailed |
| | 21.06.00 | e-mailed: complete version. |
| | 28.06.00 | Mailed: complete version. |
| | 18.07.00 | Faxed: reply to question 27. |
| Finland | 04.05.00 | e-mailed |
| France | 30.06.00 | e-mailed: complete questionnaire could be finalized in 1 month's time. |
| Georgia | 28.07.00 | e-mailed |
| Germany | 07.04.00 | e-mailed |

| | | |
|-----------------------------|----------|--|
| | 31.07.00 | e-mailed: corrected version including POPs & HMs & German regulations. |
| Greece | 11.07.00 | e-mailed |
| Hungary | 20.04.00 | e-mailed |
| | 06.07.00 | e-mailed: additional replies to questions 5, 10 and 11. |
| Ireland | 19.05.00 | e-mailed |
| | 31.05.00 | Mailed |
| Italy | 20.04.00 | e-mailed |
| | 04.05.00 | Mailed |
| Latvia | 04.04.00 | e-mailed |
| Lithuania | 06.04.00 | e-mailed |
| Monaco | 26.01.00 | Hand-delivered |
| Netherlands | 26.05.00 | e-mailed |
| | 30.06.00 | e-mailed: completed version |
| | 30.06.00 | Faxed version |
| | 30.06.00 | Mailed version |
| Norway | 10.04.00 | e-mailed |
| Poland | 25.04.00 | e-mailed |
| Republic of Moldova | 16.06.00 | e-mailed |
| Russian Federation | 28.06.00 | e-mailed |
| Slovakia | 10.04.00 | e-mailed |
| | 25.07.00 | Faxed: replies to questions 7, 8, 25, 26 and 27. |
| Slovenia | 21.07.00 | e-mailed: due to government change, questionnaire will be sent second part of August . |
| Spain | 06.06.00 | e-mailed |
| | 03.07.00 | Mailed |
| | 18.07.00 | e-mailed: EU directives, legislation applies to Spain. |
| Sweden | 17.04.00 | e-mailed |
| Switzerland | 22.05.00 | e-mailed |
| | 26.05.00 | Mailed |
| The FYR of Macedonia | 20.06.00 | Mailed |
| Turkey | 18.04.00 | Hand-delivered |
| Ukraine | 05.06.00 | e-mailed |
| United Kingdom | 10.04.00 | e-mailed |
| United States | 10.04.00 | e-mailed |
| | 26.04.00 | e-mailed |
| European Community | 12.05.00 | e-mailed |
| | 30.05.00 | Mailed |
| | 07.08.00 | Mailed: replies to question 3, 4, 5, 7, 8, 18, 20, 21 and 22. |

¹ Original deadline set for responses 10.04.00, extended deadline 31.05.00