

# **2000 Review of Strategies and Policies for Air Pollution Abatement**





# **EXECUTIVE SUMMARY**

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## I. The Convention on Long-range Transboundary Air Pollution

The Convention on Long-range Transboundary Air Pollution was adopted in 1979, establishing a broad framework throughout European and North American regions covered by the United Nations Economic Commission for Europe (UNECE) for cooperative action on air pollution. The

### Parties to the 1979 Convention on Long-range Transboundary Air Pollution:

Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, Ukraine, United Kingdom, United States, Yugoslavia, European Community.

Convention is a landmark international agreement that coordinates efforts on research, monitoring and the development of emission reduction strategies on regional air pollution and its effects. It was the first international agreement to recognize both the environmental and human health problems caused by the flow of air pollution across political borders and the need for regional solutions. Forty-eight countries and the European Community are party to the Convention.

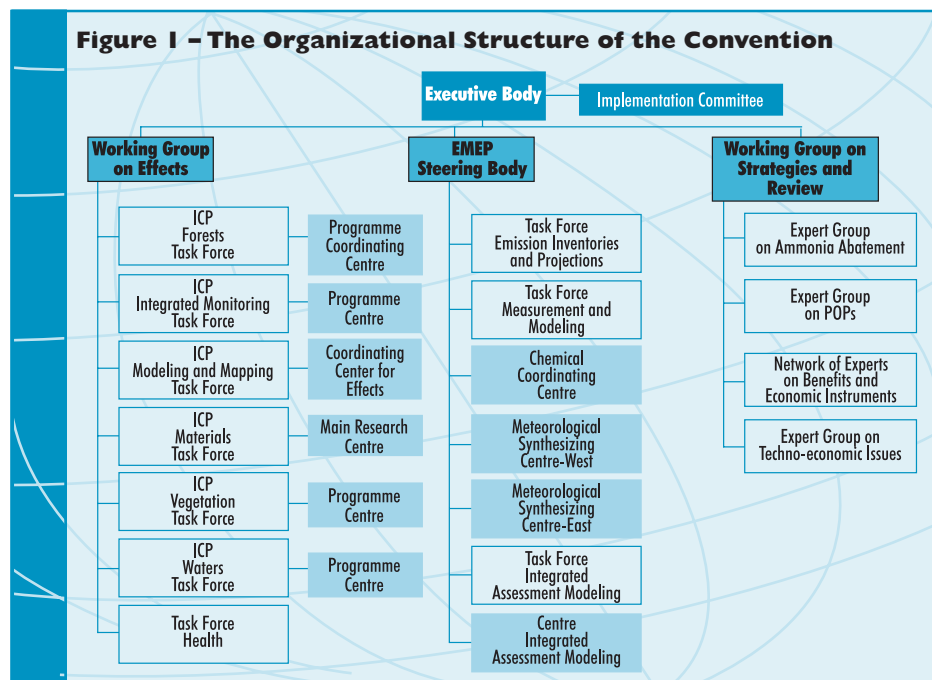
The Convention has set up a process for negotiating concrete measures to control specific pollutants through legally binding protocols. Since 1984, eight protocols have been adopted, five of which have entered into force. Those in force call for the reduction of emissions and transboundary fluxes of sulphur dioxide (SO<sub>2</sub> or “sulphur”), nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs). The three recent protocols not in force call for control of emissions of heavy metals and persistent organic pollutants (POPs) and of ammonia (NH<sub>3</sub>), NO<sub>x</sub>, VOCs and sulphur that promote acidification, eutrophication and ground-level ozone. Besides ongoing cooperation under the Convention, several Parties are

engaged in other multilateral or bilateral programmes for air pollution abatement within the UNECE region. The web site for the Convention provides more detailed information <http://www.unece.org/env/lrtap>.

## II. Activities Within the Framework of the Convention

Wide ranges of skills and activities are necessary for Parties to achieve the Convention’s objective to limit, gradually reduce and prevent long-range transboundary air pollution. The current structure of the Convention demonstrates this (figure 1). As a result of Convention activities, more than one thousand scientists and other experts are linked in an information network, greatly increasing information sharing. The Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and the Convention’s Working Group on Effects provide governments and subsidiary bodies under the Convention with qualified scientific information to support the evaluation and further development of the protocols negotiated under the Convention.

EMEP is comprised of four main elements: (a) collection of emission data; (b) measurements of air and precipitation quality; (c) modelling of atmospheric transport and deposition of air pollution; and (d) integrated assessment modelling. This review includes information on trends in emissions and the work that Parties are conducting with air pollution monitoring systems. For more detailed information on the work of EMEP, see <http://www.emep.int>.





To develop the necessary international cooperation in the research on and the monitoring of pollutant effects, the Working Group on Effects (WGE) was established under the Convention. The Working Group on Effects provides information on the degree and geographic extent of the impacts on human health and the environment of major air pollutants, such as sulphur and nitrogen oxides, ozone and heavy metals. The Working Group on Effects manages six international cooperative programmes (ICPs) that study the effects of air pollution and their trends, for forests, waters, materials including cultural heritage, vegetation including crops, ecosystem monitoring and the mapping of critical loads and levels. There is also a joint task force, with the World Health Organization (WHO), that considers health effects of air pollution. For further information see <http://www.unece.org/env/wge>.

An Implementation Committee has been set up to evaluate compliance of Parties with their obligations under the Convention and its protocols. In addition, a number of expert groups, reporting to the Working Group on Strategies and Review, provide information on economic benefits and technical measures related to air pollution abatement.

### III. 2000 Review of Strategies and Policies for Air Pollution Abatement

The information in this summary is derived in large part from replies to the 2000 Questionnaire on Strategies and Policies for Air Pollution Abatement circulated to Parties to the Convention. The purpose of the questionnaire was to develop an overview of air pollution abatement in the ECE region, as well as to provide a basis for reviewing the compliance of Parties with obligations under the protocols. The 2000 questionnaire was revised to reflect more directly these obligations. This was intended to aid the work of the Implementation Committee to assess the progress made by the Parties and the region as a whole and also to help Parties share information.

Parties were required to answer questions relating to their specific obligations to each protocol in force for them. The following 36 Parties to the Convention responded to the questionnaire, although their replies to individual questions on protocols were often dependent on whether they were Party to that protocol: Armenia, Austria, Belarus, Belgium,

Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Republic of Moldova, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, Ukraine, United Kingdom, United States and the European Community.

### IV. Emission Levels and Trends

Under the Convention, the reporting of high-quality emission data is essential both in assessing the state of air pollution within the UNECE region and in establishing the compliance of the Parties with protocol commitments. At the end of each year, Parties submit to the UNECE secretariat their official emission data for sulphur, NO<sub>x</sub>, NH<sub>3</sub>, non-methane volatile organic compounds (NMVOC), carbon monoxide (CO), methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), heavy metals and POPs.

For this review, emission data are those submitted by Parties in 2000 for their 1998 emissions. Emission totals for the major air pollutants were reported by approximately 65% of the Parties to the Convention.<sup>1/</sup> The trends in SO<sub>2</sub>, NO<sub>x</sub> and NMVOC presented here show pollutants covered by the protocols in force. The projection year emissions have been omitted from the figures referenced in this section since the 1999 Gothenburg Protocol negotiations have concluded. The signatories to this Protocol will have revised emission estimates for 2010. The summary for 2002 will address these updated emission estimates.

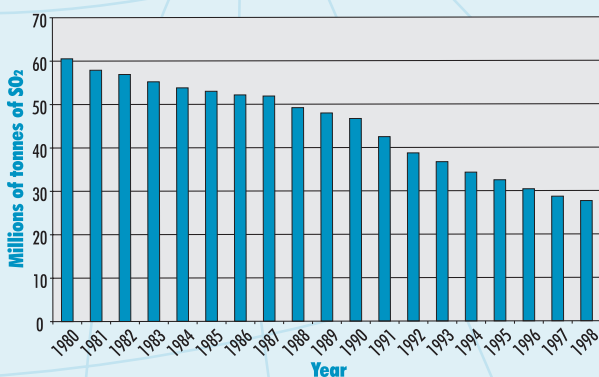
European SO<sub>2</sub> emissions (fig. 2) show a clear downward trend. The total emissions of SO<sub>2</sub> in 1998 decreased by 56% compared to the 1980 level. The emissions of NO<sub>x</sub> (fig. 3) are characterized by relatively high releases in the late 1980s and an easing-off in the 1990s. The NO<sub>x</sub> reduction is 15% between 1980 and 1998. NMVOC emissions (fig. 4) refer to anthropogenic releases only. There is a downward trend in the 1990s, leading to a drop of 25% in VOC emissions in 1998 compared to 1980.

Emission trends estimates for SO<sub>2</sub>, NO<sub>x</sub> and VOCs for both the United States and Canada are shown in figures 5-7. In addition to the joint emission trends data, 1998 data on sources of emissions by sector are presented in figures 8-10.<sup>2/</sup>

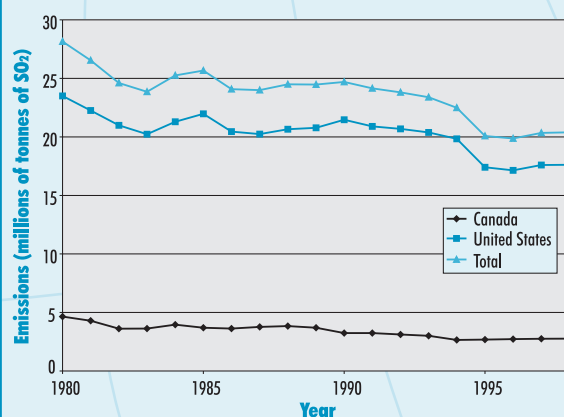
1/ When official information is not available, estimates are given, based on information from available sources, in collaboration with the Chemical Coordinating Centre (CCC) and the International Institute for Applied Systems Analysis (IIASA). Where possible, figures reported under the CORINAIR Programme (1985, 1990 and 1994) substitute missing values. "Present State of Emission Data," EB.AIR/GE.1/2000/6, 11 July 2000.

2/ United States-Canada Air Quality Agreement, 2000 Progress Report.

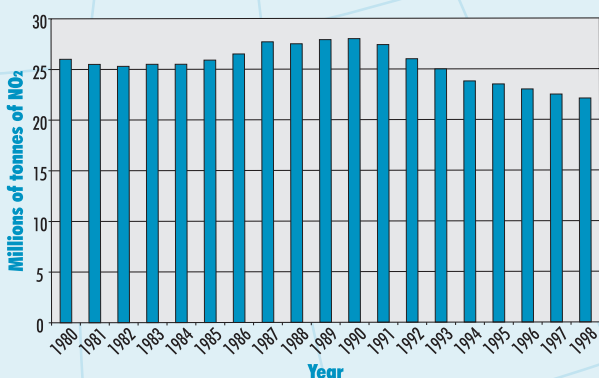
**Figure 2 – Emissions of Sulphur in the EMEP Area 1980-1998**



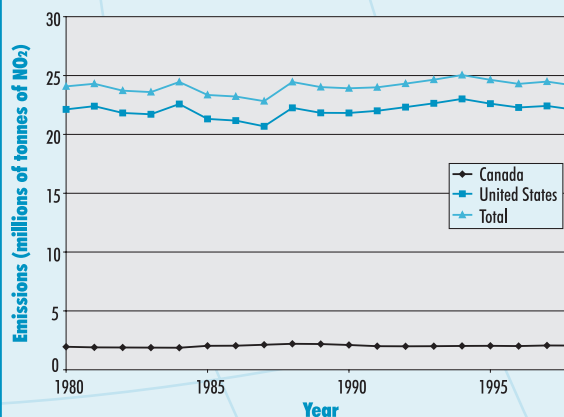
**Figure 5 – North American Trends in Sulphur Emissions from 1980-1998**



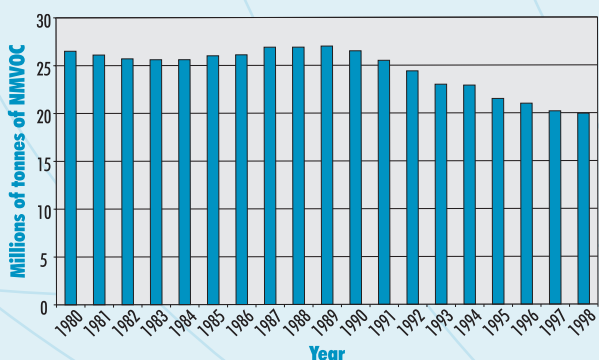
**Figure 3 – Emissions of NO<sub>x</sub> in the EMEP Area 1980-1998**



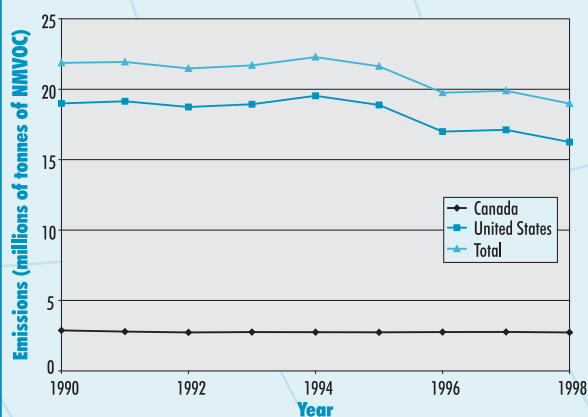
**Figure 6 – North American Trends in NO<sub>x</sub> Emissions from 1980-1998**



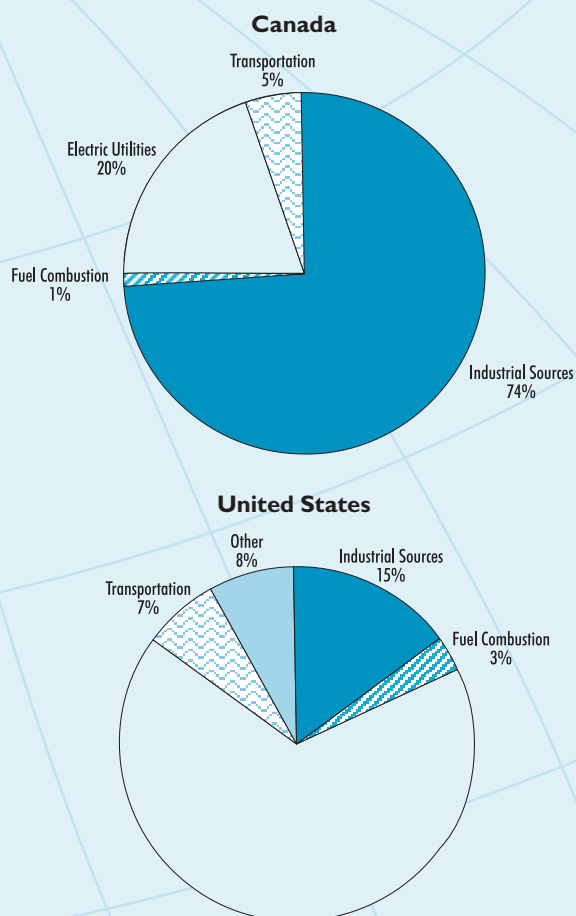
**Figure 4 – Emissions of Non-methane Volatile Organic Compounds in the EMEP Area 1980-1998**



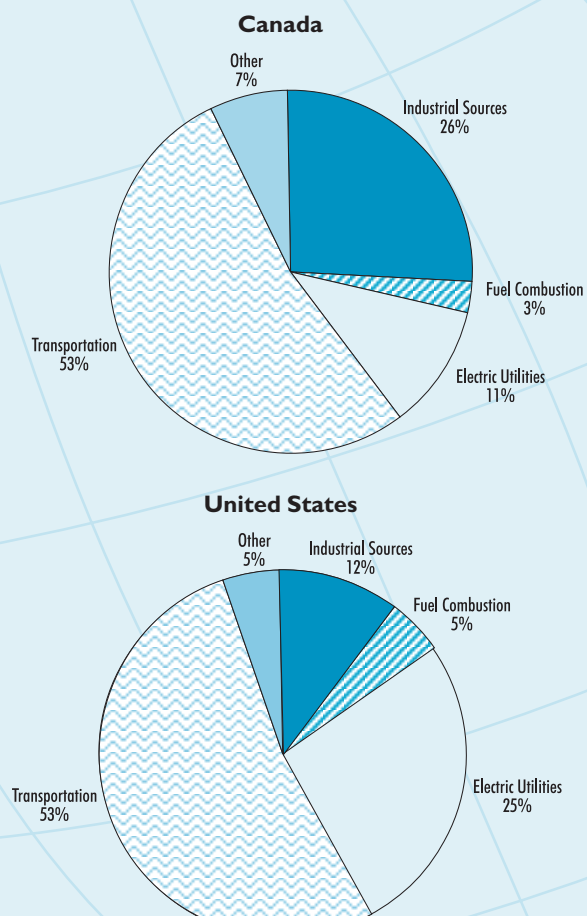
**Figure 7 – North American Trends in NMVOC Emissions from 1990-1998**



**Figure 8 – 1998 Sector Emissions of SO<sub>2</sub> in North America**



**Figure 9 – 1998 Sector Emissions of NO<sub>x</sub> in North America**



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