



*Environmental
Factsheet
No. 3, April 1993*

Previous factsheets in the series:

No.1 Forest damage in Europe
(December 1992)

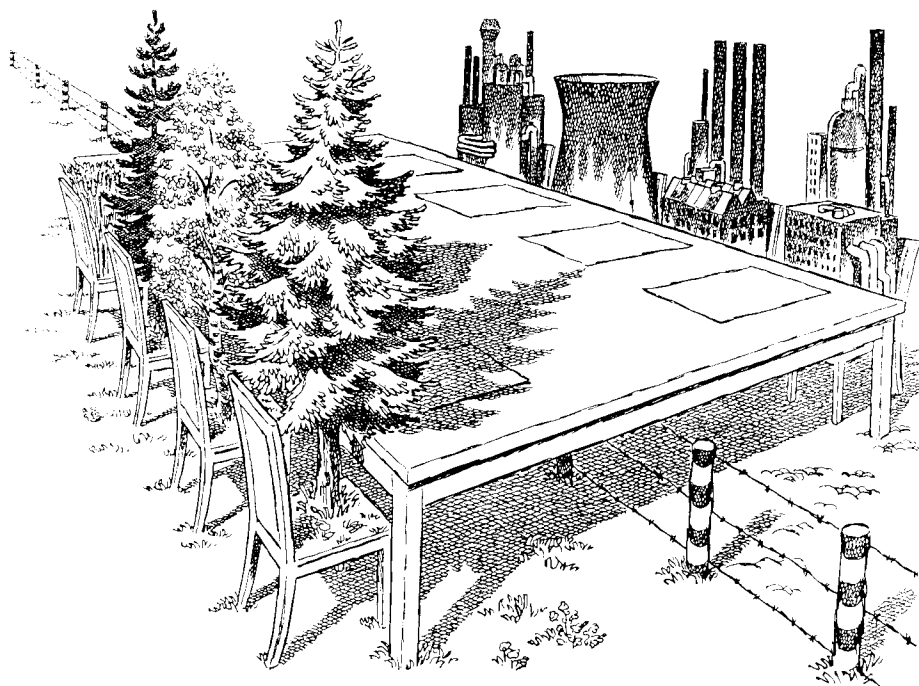
No.2 Critical loads
(February 1993)

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THE UN ECE CONVENTION



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Air pollution treaty

IT IS ESTIMATED that the countries of the United Nations Economic Commission for Europe (ECE) emit about 70 million tons of sulphur dioxide and 45 million tons of nitrogen oxides, which is more than 40 per cent of the global anthropogenic emissions of these pollutants. They are furthermore responsible for at least one half to two-thirds of all the manmade emissions of carbon dioxide.

Although the ECE is mainly concerned with trade, transportation, and statistics, the fact that it includes the countries both of eastern and western Europe, as well as the USA and Canada, puts it in a good position to deal also with environmental problems such as air pollution.

The 1979 Convention on Long Range Transboundary Air Pollution was the first multilateral treaty concerning air pollutants. Initially the focus was on reducing the effects of acid rain through the control of sulphur emissions. Later, however, activities were widened to include nitrogen pollutants, volatile organic compounds and photochemical ox-

dants. And in the last few years heavy metals and persistent organic pollutants have also been made part of the work program.

Exports and imports

Already in the mid-1970s it had been clearly demonstrated that air pollutants can be transported over hundreds and even thousands of kilometres, and thus be "exported" and "imported" from one country to another.

Since 1977 the monitoring of transboundary air pollution has been carried out under a European-wide program known under the abbreviation of EMEP. The EMEP network now comprises about 100 monitoring stations in some twenty-five countries. It provides data on sulphur and nitrogen emissions (in the form of oxides of nitrogen, NO_x , as well as ammonia, NH_3), on their atmospheric transformation, transport, and subsequent deposition, and since 1989 emissions of volatile organic compounds (VOCs) and the formation of photochemical oxidants, such as ozone, have also been included. Further the EMEP maps

the transboundary fluxes of these pollutants, thus providing information as to "who does what to whom."

The Convention

At the beginning of 1977, Norway proposed the adoption by the ECE of an international convention on

long range transboundary air pollution. Then, referring to the declaration of the 1972 UN Conference on the Human Environment in Stockholm, which says that states have an obligation to ensure that activities carried out in one country do not give rise to environmental damage in others (principle No.

21), the Scandinavian countries made a joint presentation of a draft text for a convention. After some hard negotiating – the most reluctant country at that time was the Federal Republic of Germany – the Convention on Long Range Transboundary Air Pollution (CLRTAP), hereafter called the Convention, was signed in Geneva on November 13, 1979, by all of the (by then) thirty-five members of the ECE (see Figure 1). After ratification by twenty-four of them, it entered into force in March, 1983.

The Convention does not in itself call for any binding commitments for the reduction of emissions. The text only says that countries shall "endeavour to limit and, as far as possible, gradually reduce and prevent air pollution, including long range transboundary air pollution," and that, in order to achieve this, they shall "use the best available technology that is economically feasible." The signatories were also to cooperate in the development of plans for the control of emissions. This vagueness naturally displeased many countries, in particular the Scandinavian.

One of the first significant decisions made by the parties to the Convention, after its coming into force, was to take over the financial responsibility for the EMEP monitoring program. To this end, in September 1984 the Executive Body of the Convention adopted a protocol concerning the long-term financing of the EMEP.

The Sulphur Protocol

Proceeding from the outcome of the 1982 Stockholm Conference on Acidification of the Environment, the Scandinavian countries put forward a concrete proposal to reduce sulphur emissions by at least 30 per cent between 1980 and 1993. The 30-per-cent criterion was to be regarded as a first step in a long-term project for reducing emissions. The proposal was supported by the Federal Republic of Germany, Switzerland, Austria, and Canada, forming, together with the Scandinavians, what has come to be known as the Thirty Per Cent Club.

At a meeting in Munich in the

Figure 1. Status of the UN ECE Convention on Long Range Transboundary Air Pollution and its related Protocols (as of December 1992).

	Convention (a)		EMEP Prot. (b)		SO ₂ Prot. (c)		NO _x Prot. (d)		VOC Prot. (e)
	Sign.	Rat.	Sign.	Rat.	Sign.	Rat.	Sign.	Rat.	Sign.
Austria	1979	1982	–	1987	1985	1987	1988	1990	1991
Belgium	1979	1982	1985	1987	1985	1989	1988	–	1991
Bulgaria	1979	1981	1985	1986	1985	1986	1988	1989	1991
Byelorussia	1979	1980	1984	1985	1985	1986	1988	1989	–
Canada	1979	1981	1984	1985	1985	1985	1988	1991	1991
Cyprus	–	1991	–	1991	–	–	–	–	–
CSFR	1979	1983	–	1986	1985	1986	1988	1990	–
Denmark	1979	1982	1984	1986	1985	1986	1988	–	1991
Finland	1979	1981	1984	1986	1985	1986	1988	1990	1991
France	1979	1981	1985	1987	1985	1986	1988	1989	1991
Germany	1979	1982	1985	1986	1985	1987	1988	1990	1991
Greece	1979	1983	–	1988	–	–	1988	–	1991
Holy See	1979	–	–	–	–	–	–	–	–
Hungary	1979	1980	1985	1985	1985	1986	1989	1991	1991
Iceland	1979	1983	–	–	–	–	–	–	–
Ireland	1979	1982	1985	1987	–	–	1989	–	–
Italy	1979	1982	1984	1989	1985	1990	1988	1992	1991
Liechtenstein	1979	1983	–	1985	1985	1986	1988	–	1991
Luxembourg	1979	1982	1984	1987	1985	1987	1988	1990	1991
Netherlands	1979	1982	1984	1985	1985	1986	1988	1989	1991
Norway	1979	1981	1984	1985	1985	1986	1988	1989	1991
Poland	1979	1985	–	1988	–	–	1988	–	–
Portugal	1979	1980	–	1989	–	–	–	–	1992
Romania	1979	1991	–	–	–	–	–	–	–
Russian Fed.	1979	1980	1984	1985	1985	1986	1988	1989	–
San Marino	1979	–	–	–	–	–	–	–	–
Slovenia	–	1992	–	1992	–	–	–	–	–
Spain	1979	1982	–	1987	–	–	1988	1990	1991
Sweden	1979	1981	1984	1985	1985	1986	1988	1990	1991
Switzerland	1979	1983	1984	1985	1985	1987	1988	1990	1991
Turkey	1979	1983	1984	1985	–	–	–	–	–
Ukraine	1979	1980	1984	1985	1985	1986	1988	1989	1991
United Kingdom	1979	1982	1984	1985	–	–	1988	1990	1991
USA	1979	1981	1984	1984	–	–	1988	1989	1991
Yugoslavia	1979	1987	–	1987	–	–	–	–	–
Eur. Community	1979	1982	1984	1986	–	–	–	–	1992
Total	34	34	22	32	20	20	26	20	23

(a) Convention on Long-range Transboundary Air Pollution, adopted 13.11.1979, entry into force 16.3.1983.

(b) Protocol to the 1979 LRTAP Convention on Long-term Financing of the Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP), adopted 28.9.1984, entry into force 28.1.1988.

(c) Protocol to the 1979 LRTAP Convention on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent, adopted 8.7.1985, entry into force 2.9.1987.

(d) Protocol to the 1979 LRTAP Convention concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes, adopted 31.10.1988, entry into force 14.2.1991.

(e) Protocol to the 1979 LRTAP Convention concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes, adopted 18.11.1991.

summer of 1984, ministers representing all the signatories to the Convention decided it was necessary to have an international agreement to reduce sulphur emissions that would be legally binding.

The signing of a protocol on sulphur took place in Helsinki, Finland, on July 8, 1985. Originally signed by twenty-one parties to the Convention, it came into force in September, 1987. It requires the signatories to reduce their national annual emissions of sulphur, 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 calculation.

It was this agreement that first brought the Convention to public attention, making it to be seen as a viable means towards an international abatement of air pollution.

Some of the largest polluting nations such as the United States, Poland, the United Kingdom, and Spain have still not signed the protocol, despite the fact that governmental adherence has become something of a test, in the public mind, of environmental commitment.

Many countries have however decided on more far-reaching reductions than the 30 per cent. Today, some ten nations are aiming at halving, or more than halving, their sulphur emissions by the mid-1990s. Three countries – Finland, the Netherlands and Sweden – have declared the reduction of sulphur emissions by 80 per cent between 1980 and 2000 to be a national target. According to EMEP data, too, the European emissions of sulphur decreased by 26 per cent between 1980 and 1990 (Figure 2).

The NO_x Protocol

On November 1, 1988, an agreement to limit the emissions of nitrogen oxides was signed in Sofia, Bulgaria. Specifically, the NO_x protocol stipulates that, after 1994, emissions shall not exceed their 1987 level. In other words, it does not call for any actual reduction, but only a freezing of emissions. It does however lay down a second step involving measures to reduce emissions, and requiring them to

Table 2. Total European emissions of sulphur and nitrogen oxides.

	Sulphur (1000 tons)	Nitrogen oxides (1000 tons as NO ₂)
1980	27523	21781
1990	20330	22875
Change	-26%	+5%

Source: EMEP/MSC-W Report 1/92.

take account of internationally accepted critical loads. Negotiations to this end were to start no later than six months after the protocol had come into force. Actual measures aimed at reducing emissions should begin to be introduced no later than 1996. The NO_x protocol has been signed by 26 parties to the Convention, and after having been ratified by a sufficient number of states, entered into force in February, 1991.

Twelve of the countries that had signed the NO_x protocol showed their displeasure at its weakness by binding themselves in a joint declaration to actually reduce their emissions of nitrogen oxides. They are to bring about a reduction of 30 per cent at the latest by 1998, using the level of any year between 1980 and 1986 as their base year. The declaration was signed by Austria, Belgium, Denmark, the FRG, Finland, France, Italy, Liechtenstein, the Netherlands, Norway, Sweden, and Switzerland.

In November 1988, a new working group was appointed to develop a common understanding of the critical loads approach (see Environmental Factsheet No.2) and to evolve abatement strategies based on that approach. In 1989 its mandate was further extended, to prepare a new protocol for bringing about a further reduction of sulphur emissions after 1993, when the relevant Helsinki protocol expires.

The VOC Protocol

Negotiations aimed at reducing the emissions of volatile organic compounds (also called hydrocarbons), and thereby the formation of photochemical oxidants, primarily ozone, were started in November 1988, and after almost three years a protocol on volatile organic com-

pounds (VOCs) was signed by twenty-one countries (on November 19, 1991) in Geneva. Later, two more parties have joined this protocol. The prime aim is to reduce the magnitude and the number of episodes with high concentrations of ozone.

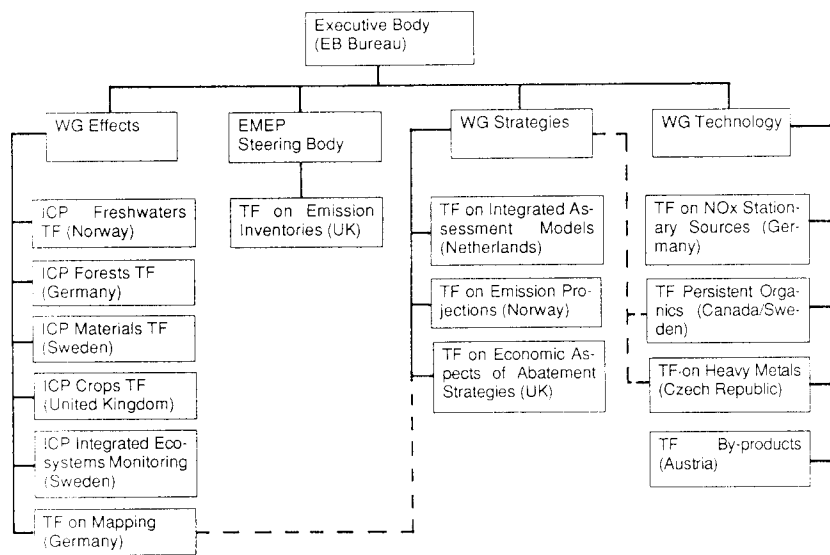
Most of the signatory countries have committed themselves to reducing their emissions of VOCs by at least 30 per cent by 1999, with 1988 as the base year. Some have however elected to take the alternative of any year between 1984 and 1990 as their base year. Three countries (Norway, Canada, and the Ukraine) are confining their 30-per cent reduction to certain specified areas – so-called Tropospheric Ozone Management Areas (TOMAS). This is allowable if it is only from these areas that the emissions of VOCs contribute to the concentrations of ozone in other countries. Emissions in the other, exempted, areas can increase so long as the total national emissions do not.

Certain so-called small emitter countries were given the possibility of signing the protocol while undertaking only to freeze emissions, i.e. ensuring that at latest by 1999 their annual emissions did not exceed the 1988 levels. This would apply only to countries whose annual emissions in 1988 were less than 500,000 tons, and 20 kilograms per capita, and 5 tons per square kilometre. The following countries coming under this category have signed the protocol accordingly: Bulgaria, Greece, and Hungary.

The critical loads approach

It has been agreed that the critical loads concept provides an acceptable, effects-based scientific approach by which to devise strategies for the abatement of air pollution. The essence of the critical-loads approach is that reductions of emissions are to be negotiated on the basis of the effects of air pollutants, rather than on an equal percentage of reduction for every country. The goal is to reduce, in a cost-effective manner, the emissions of air pollutants to levels where, ultimately, the critical loads will not be exceeded.

Figure 3. The UN ECE Convention on Long Range Transboundary Air Pollution.



The Executive Body (EB), which meets annually, is the supreme policy-making assembly on which all parties to the Convention are represented. Subsidiary to the EB are a number of Working Groups (WGs), which deal with specific sectors of the Convention's workplan and are open to all parties. Assisting them are various Task Forces (TFs), either of an ad hoc nature (e.g. to produce a specific report), or to supervise a current program. Responsibility for each TF rests with a designated lead country. Five International Co-operative Programmes (ICPs) are working on effects on forests, surface waters, crops, and materials, as well as on the integrated monitoring of the effects of air pollution on ecosystems. The Co-ordination Centre for Effects (CCE) in the Netherlands serves the Convention by producing European maps of critical loads.

It is further said that because of economic, technological, and other constraints, the reductions may not be attainable everywhere, or in one step, and therefore an approach involving several steps is likely to be needed.

Here follows a rough outline of how the critical-loads approach is likely to be used in working out new agreements.

Based on current and projected emissions, and on monitoring data, national assessments of current and projected loads and levels of various pollutants will be made. Such projections can be made by using computer models, such as RAINS (developed by IIASA, the International Institute for Applied Systems Analysis).

Each country is to make maps depicting the critical loads and levels for various areas, receptors, and pollutants in its own territory, and to provide guidance as to how it should done, a manual has been

produced. Mapping is steadily proceeding, and by early 1993 more than fifteen countries had made and submitted critical-load maps for sulphur and/or total acidity. The resulting data is being assembled by the Coordination Centre for Effects (CCE), and used in the production of Europe-wide maps for critical loads. Taking data on the current depositions of pollutants, the CCE is making further maps to show where and by how much the critical loads are being exceeded over various parts of Europe.

Countries will also be setting target loads. Reflecting a necessary step-wise approach, these may be regarded as intermediate objectives, on the way towards bringing depositions down to levels corresponding to the critical loads. Furthermore, countries are expected to develop national strategies for the abatement of emissions.

Computer models for integrated assessment, such as RAINS, will en-

able comparisons to be made of the cost and effectiveness of various strategies for reaching the abatement necessary to achieve the target loads.

In order to arrive at new agreements on the reduction of emissions, there are to be international negotiations on target loads and strategies for abatement. Such agreements are likely to result in the setting of varying (intermediate) emission ceilings for each country, under which it must get by a specified year.

New protocols

A new sulphur protocol based on the critical loads concept is presently being negotiated by the Working Group on Strategies, and a draft is expected to be ready for signing by the autumn of 1993.

During the last year or so, several countries have proposed that future agreements (subsequent to the new sulphur protocol) should be related more to effects and therefore cover several pollutants. For example, the NO_x protocol could be replaced by an "acidification protocol," covering both sulphur and nitrogen oxides as well as ammonia. Alternatively, for controlling photochemical oxidants, there could be an "ozone protocol," including VOCs and nitrogen oxides.

Further reading

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