UNITED NATIONS ECONOMIC COMMMISSION FOR EUROPE

Protecting the Air We Breathe

40 years of cooperation under the Convention on Long-range Transboundary Air Pollution

UNECE

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1 Introduction

When scientists in the 1960s investigated the causes of the acid rain that was destroying forests, causing fish loss in lakes and putting entire ecosystems at risks in the Northern Hemisphere, they discovered that air pollutants, a significant part of which were emitted thousands of kilometers away, were the culprit.

Environmental issues took center stage for the first time in 1972 at the international level at the United Nations Conference on the Human Environment in Stockholm. Air pollution was also recognized as an issue of concern that required international cooperation in the Final Act of the Helsinki Conference on Security and Cooperation in Europe in 1975. These two landmark conferences (and many more formal and informal talks between several countries on both sides of the Iron Curtain) paved the way for intergovernmental negotiations culminating in the signing of the UNECE Convention on Long-range Transboundary Air Pollution (Air Convention).

In 1979, 32 countries in the pan-European region decided to cooperate to reduce air pollution. In signing the UNECE Convention on Long-range Transboundary Air Pollution, they created the first international treaty to deal with air pollution on a broad regional basis. After entering into force in 1983, the Convention laid down the general principles of international cooperation for air pollution abatement and set up an institutional framework which has since brought together science and policy.

Over the last 40 years since its inception, the Convention has substantially contributed to the development of international environmental law and has created the essential framework for controlling and reducing the damage to human health and the environment caused by transboundary air pollution. It is a successful example of what can be achieved through intergovernmental cooperation.

2 Achievements

Emission reductions and effects

The result of the collective effort over the last 40 years has been remarkable: emissions of a series of harmful substances have been reduced by 40 to 80 per cent since 1990 in the region. In particular, the decrease in sulphur emissions has led to healthier forest soils.

Particulate matter concentrations at European measurement sites declined by around a third between 2000 and 2012. National average annual concentrations of fine particulate matter ($PM_{2.5}$) fell by 33 per cent between 2000 and 2012 in the United States of America, and by 4 per cent in Canada. The number of days exceeding the World Health Organization's guideline level for ozone concentrations is now about 20 per cent lower than in 1990.

The decoupling of economic growth and air pollution trends has prevented 600,000 premature deaths annually in Europe and North America. The average life expectancy has increased by 12 months, thanks to emission reductions.

A common scientific understanding

The solid scientific underpinning of the Convention has been important for its success. The scientific network under the Convention has successfully developed a common knowledge providing for joint monitoring, modelling and effects-based programmes. The Convention has also served as a platform for scientists and policymakers to exchange information, leading to innovative approaches and mutual trust and learning.

Long before negotiations on the Convention started in the late seventies, countries in Europe established scientific cooperation across borders to tackle the problem of air pollution, acid rain, and die-back of forests. In particular, it was the need to compare data and share experiences that led to the development of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) under the auspices of UNECE in 1977.

Early on in the discussions on the Convention, it became clear that a good understanding of the harmful effects of air pollution was a prerequisite for reaching agreement on effective pollution control. The Working Group on Effects (WGE) was established under the Convention in 1980 in order to develop the necessary international cooperation in the research on and the monitoring of pollutant effects.

Despite Cold War political tensions in the 1980s, the two scientific bodies have since developed into the backbone of the science-policy interface for the Convention. The consistent exchange of experience and know-how through the network of scientists over the years has enabled continued progress towards ever more refined, accurate and comparable data. One of the most important achievements of the groups has been bringing together scientists and policymakers in the UNECE region for common and productive dialogue to support progress in improving air quality. It is essential to maintain and strengthen the close two-way linkages between science and policy.

Meeting of the delegations of Norway and the USSR and exchange of views on the preparation of a future Convention on Transboundary Air Pollution (Moscow, 1979); Gro Harlem Brundtland, Minister of the Environment of Norway (left) and Leonid Nikolaevich Efremov, First Deputy Chairman of the State Committee on Science and Technology, USSR (right). Photo courtesy of Valentin Sokolowsky.

Source-Receptor Matrices

Although there was enough scientific evidence for the transboundary transport of air pollution from the beginning, it was at first not so easy to separate local (national) deposition and imported deposition on a bigger geographic scale. Calculations that were undertaken within the EMEP structure to distinguish between 'foreign' and 'home-made' pollution were presented in the form of source-receptor matrices. With these source-receptor matrices, it is possible to show how much of a country's own emissions fall within its territory. One can also demonstrate the transboundary fluxes from a selected country to other regions.

Integrated Assessment Modelling

Integrated Assessment Modelling has played a vital role in policy negotiations under the Convention. The goal is to facilitate the design of an international cost-effective and effect-based policy, taking into account equity criteria as well as the relevant differences in environmental sensitivities. Over time, integrated assessment models of air pollution have become increasingly complex, considering different pollutants, their interactions and the effects of air pollution on different receptors.

Work on the models, particularly the Regional Acidification Information and Simulation (RAINS) model – led by the International Institute for Applied Systems Analysis –, increasingly fostered collaboration between scientists in the East and the West. The RAINS model was used as a basis for protocol negotiations under the Convention and has been, over the years, further developed to address emission control strategies that simultaneously address air pollutants and greenhouse gases in order to maximize benefits at all scales – what has come to be known as the Greenhouse Gas – Air Pollution Interactions and Synergies (GAINS) model.

From Environmental Concerns to Health Concerns

At the time of the establishment of the Convention, the main driving force was the problem of acidified freshwaters in Scandinavia and Canada, and the initial aim was to reduce emissions and transboundary flows of sulphur pollution. Subsequently, harmful effects on other ecosystems, such as forests, also came into focus.

While the damage to ecosystems continued to be the main concern throughout the 1980s, the damaging impacts of air pollutants to human health became an issue of growing concern in the 1990s. Interactions between air pollution and climate change have also become a field of study for the Convention.

CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

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