



**Economic and Social  
Council**

Distr.  
GENERAL

EB.AIR/WG.1/1998/14  
15 May 1998

Original: ENGLISH

**ECONOMIC COMMISSION FOR EUROPE**

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

Working Group on Effects  
(Seventeenth session, 26-28 August 1998)  
Item 7 (c) of the provisional agenda

CONFERENCE ON NITROGEN: NITROGEN - THE CONFER-N-s

Note prepared by the Chairman of the Working Group on Effects  
in consultation with the secretariat

I. INTRODUCTION

1. The conference on nitrogen, Nitrogen - the Confer-N-s, took place in Noordwijkerhout, Netherlands, from 23 to 27 March 1998. The conference was organized by the Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM), the Netherlands National Institute of Public Health and the Environment (RIVM) and the Netherlands Energy Research Foundation (ECN). It was attended by 180 participants from the following Parties to the Convention: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States of America, and the European Community. Representatives from Brunei Darussalam, India, Indonesia,

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.

Japan, New Zealand and South Africa attended. The Organisation for Economic Co-operation and Development (OECD) and the UN/ECE secretariat were also represented.

2. The conference had been included in the work-plan of the Executive Body for the Convention as part of its activities to further develop the science and associated policy required for the control of atmospheric emissions of nitrogen pollutants. Consequently, the conference aimed to: (i) build scientific knowledge and consensus on the problems of environmental pollution and changes brought about by nitrogen compounds and on solutions; (ii) stimulate discussions and collaboration among experts, policy makers and target sectors like agriculture, transport and energy production; and (iii) focus more political attention on environmental pollution and changes brought about by nitrogen compounds at national, regional and global levels.

3. A draft conference statement had been prepared prior to the conference by the organizers and an international science and policy committee. It was circulated to the participants and revised during the conference. A statement was agreed on for the end of the conference. It explained the conference's overall objective of providing a forum for discussion and debate about: (i) present scientific understanding of the nitrogen cycle on a global, regional and local scale; and (ii) the adequacy of contemporary tools for managing nitrogen both as a nutrient input into agriculture and forestry and as a cause of air, water and soil pollution.

## II. CONFERENCE DISCUSSIONS

4. The conference was opened by the Netherlands Minister for Housing, Spatial Planning and the Environment, Mrs. M. de Boer. She highlighted, in particular, the policies adopted by the Government of the Netherlands in relation to the objectives of the conference and stressed the need for an integrated approach to solving environmental problems caused by nitrogen. Mr. L. Nordberg (UN/ECE secretariat) described the work under the Convention, noting its strengths and successes and the work that was being done to address the problem of nitrogen pollution.

5. The conference was organized in a series of plenary and parallel sessions focusing on global, regional and local issues. Seventeen papers were presented during the plenary presentations and more than 90 during the parallel sessions. More than 40 poster papers were also presented. The chairman of each session agreed three summary statements with the authors of the papers and these formed the basis of the concluding statements. These summary statements were agreed in plenary and published, together with the rest of the conference statement, in English, after final editing by the science and policy committee.

6. The conference statement and refereed written papers on the presentations and posters have been presented for publication to the journal "Environmental Pollution". They are expected to be published in late 1998.

### III. CONFERENCE STATEMENT CONCLUSIONS

7. The conference concluded that work under the Convention on Long-range Transboundary Air Pollution of the UN/ECE and by the European Commission was leading to an integrated abatement strategy for nitrogen (N) in which the various effects of the surplus of N were being considered. These strategies were supported by new research results, but there was concern about the implementation of the necessary abatement measures.

8. The concluding statements were grouped under four headings; general, processes, abatement and final conclusions.

9. Some of the general conclusions were that:

(a) The three important N pollutants are: NO<sub>x</sub> from combustion processes, NH<sub>3</sub> from agriculture and N<sub>2</sub>O from denitrification;

(b) Food production is increasing rapidly and this is effecting changes in the N cycle;

(c) The complexity of N pollution is the result of the cascading effect of N through the environment, a large number of effects may result from the same emissions, e.g. increased respiratory disease in humans, nitrate contamination of drinking water, ozone damage to crops, acidification, eutrophication, odour problems, changes in biodiversity, destruction of the ozone layer, global climate change, corrosion of monuments and engineering materials and reduced visibility;

(d) In many European ecosystems, the high N load is the major factor in the reduction of biodiversity.

10. Some of the conclusions on processes were that:

(a) There is evidence of increased forest growth in Europe due to increased N deposition;

(b) Nutrient imbalances caused by N deposition are important;

(c) N deposition results in increased nitrophylic communities;

(d) The C/N ratio in forest soils may be used to indicate N leaching;

(e) The spatial scale of NH<sub>x</sub> deposition is dependent on its chemical form;

(f) Peroxy-acetyl nitrate (PAN), which is formed in the atmosphere, is a powerful oxidant with a long residence time; it is a worldwide problem;

(g) N<sub>2</sub>O warrants a high priority on policy and research agendas.

11. Some of the conclusions on abatement were that:

- (a) Because of the cascade effect, measures to reduce effects should focus on decreasing N compound production, as well as on converting fixed N into N<sub>2</sub>; measures should be directed towards decreasing reactive nitrogen compounds in the environment if agreed targets are to be met;
- (b) Environmental N might be reduced by including environmental costs in products, but this would need to be introduced gradually;
- (c) The budget for environmental measures should be linked to economic growth, as this, in turn, is linked to N emissions;
- (d) Social behavioural changes could bring about reductions in N emissions;
- (e) NH<sub>3</sub> emissions can be reduced by reducing animal numbers, by technical measures and by more mixed farming;
- (f) Agricultural losses may be reduced by a more timely and prudent use of fertilizer;
- (g) It is more cost-effective to focus abatement measures for NH<sub>3</sub> on the highest emission/deposition areas;
- (h) NO<sub>x</sub> can be reduced by optimizing combustion, decreasing the burning of fuel, and catalytic conversion of NO<sub>x</sub> to N<sub>2</sub>;
- (i) NO<sub>x</sub> from traffic remains a major source in some areas, although other sources may be larger overall.

12. The final conclusions may be summarized as follows:

- (a) Nitrogen pollution is recognized in Europe but much less so in other parts of the world, even where the situation is becoming similar to that in Europe; abatement policies will be needed in these areas (especially in Asia);
- (b) An integrated approach is essential to ensure that targets for all effects are met;
- (c) A new approach, the optimum nitrogen level, is suggested as an alternative to critical loads that could be applied to all land uses; deposition/concentrations would need to be reduced to optimum levels (to maximize benefits and minimize harm) using local and regional strategies;
- (d) While the N cycle and some N effects are reasonably well understood, the magnitude of some key processes and ecological effects are still uncertain and the spatial and temporal resolution of emission inventories need to be improved;
- (e) Societal demands for justifying control measures imply the need for continued scientific funding;
- (f) There is a need for strengthening the ongoing synchronization of activities carried out by the various international bodies: EU, UN/ECE, IPCC, OSPAR/PARCOM.

13. The conference also concluded that, because of the growing awareness that

N is a key element in many environmental issues and because global N fixation is rising rapidly, a second international Nitrogen Confer-N-s should be scheduled. It was suggested this might take place in the United States of America in late 2001.