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AMMONIA ABATEMENT IN AGRICULTURE AND NATURE

Summary report by the Chairmen of the Expert Group on Ammonia Abatement and the panel on agriculture and nature of the Task Force on Emission Inventories and Projections in collaboration with the secretariat

Introduction

1. In accordance with the work-plan for the implementation of the Convention (ECE/EB.AIR/75, annex VI, item 1.8) and at the invitation of the Government of Austria, the Expert Group on Ammonia Abatement held a joint meeting with the panel on agriculture and nature of the Task Force on Emissions Inventories and Projections from 28 to 30 October 2002, in Vienna. The meeting was attended by experts from the following Parties: Austria, Denmark, France, Germany, Hungary, Ireland, Italy, Netherlands, Norway, Slovenia, Sweden, Switzerland, United Kingdom. A representative from the Centre for Integrated Assessment Modelling (CIAM) was also present, as was a member of the UNECE secretariat. A representative of the European Fertilizer Manufacturers Association (EFMA) was also present. Summaries of selected presentations may be accessed at:

<http://www.unece.org/env/Irtap/wg/aa>.

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2. Mr. Ian DAVIDSON (United Kingdom) and Mr. Ulrich DÄMMGEN (Germany) co-chaired the meeting.
3. The meeting was opened by Mr. A. PÖLLINGER (Austria), who welcomed the participants on behalf of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Government of Austria. He stressed the importance of convening the meeting in conjunction with the expert panel on agriculture and nature of the Task Force on Emissions Inventories and Projections in order to target gaps in emissions inventories for ammonia, from both agricultural and non-agricultural sources. He noted, moreover, the importance of coordinating efforts with the newly established Expert Group on Techno-economic Issues, in order to assess the costs of measures to abate ammonia emissions and to provide aggregated cost data to CIAM for input into European-scale modelling through the RAINS model, as part of the upcoming review of the Gothenburg Protocol.

I. PRIORITIES OF THE EXPERT GROUP

4. The Chairman, Mr. Ian DAVIDSON, reiterated the priorities of the Expert Group on Ammonia Abatement as follows:
 - (a) To review the Guidance Document on Control Techniques for Preventing and Abating Emissions of Ammonia (EB.AIR/1999/2, chap.V);
 - (b) To promote the Framework Advisory Code of Good Agricultural Practice for Reducing Ammonia Emissions (EB.AIR/WG.5/2001/7) and the relevant section of the European Union's Integrated Pollution Prevention and Control Best Available Technology reference document for pigs and poultry, and to assist Parties with the development of national procedures;
 - (c) To further examine non-agricultural sources of ammonia emissions;
 - (d) To work more closely with EMEP, in particular the Task force on Emissions Inventories and Projections and the Task Force on Measurements and Modelling and to coordinate its work with the Expert Group on Techno-economic Issues under the Working Group on Strategies and Review.
5. He noted that the key questions facing the Expert Group included the following:
 - (a) Were countries using the Guidance Document to develop emissions inventories and abatement strategies in a transparent way?
 - (b) Were countries developing national codes of good agricultural practice?
 - (c) How did new data and projections on ammonia affect targets for 2010?
6. The meeting discussed its future work-plan and asked the secretariat to reflect in the work-plan of the Convention for 2004 the following elements:

- (a) Assessment of progress toward the 2010 emission targets and work to support the review of the Gothenburg Protocol;
- (b) Further work to identify and quantify non-agricultural emissions of ammonia, to be included in national inventories;
- (c) Development of transparent emissions and abatement reporting systems;
- (d) Linking emissions to measurements of ammonia and ammonium concentrations and modelling of the atmospheric processes and impacts;
- (e) Maintaining and updating the Guidance Document, particularly with respect to animal housing;
- (f) Strengthening links with countries from Eastern Europe and Central Asia including, but not limited to, finding ways to increase their participation in meetings and workshops related to ammonia abatement.

II. AMMONIA ABATEMENT IN THE CONTEXT OF THE CONVENTION

7. Ms. B. WACHS of the UNECE secretariat explained the mandate of the Expert Group in the context of the Working Group on Strategies and Review and other expert groups and task forces. Coordinating work in the coming two years with the ammonia panel of the Expert Group on Techno-economic Issues would ensure a harmonized approach to cost data related to ammonia abatement techniques.

8. Mr. R. BALLAMAN (Switzerland), Chairman of the Working Group on Strategies and Review, presented the relevant work and decisions of the Working Group, and encouraged cooperation between the two expert groups, on ammonia and techno-economic issues. At its thirty-fourth session, the Working Group on Strategies and Review had taken note of the report of the Expert Group on Ammonia Abatement (EB.AIR/WG.5/2002/3) and encouraged the review and revision of the Guidance Document in the context of the review of the Gothenburg Protocol, to include state-of-the-art abatement technology, and stressed the importance of cooperation with EMEP in particular the Task Forces on Integrated Assessment Modelling, Emissions Inventories and Projections, and Measurements and Modelling. Once the Gothenburg Protocol entered into force, the next step would be to review the emission ceilings and techniques in its technical annexes. The review was likely to include consideration of particulates and their health impacts. Initially, 2015 and 2020 would be considered as the target years in the review, although these may be re-evaluated in the light of data quality and uncertainties. He pointed out, moreover, that the European Commission's Clean Air for Europe (CAFE) programme had an earlier target year (i.e. 2010).

9. Ms. A. VIPOND (United Kingdom) encouraged the Expert Group to consider projections in the context of the EC Common Agricultural Policy on ammonia, since the CAFE programme called for projections on ammonia to 2020. The European Topic Centre on Air and Climate Change (ETC/ACC) was developing baseline scenarios to 2020 for the Ministerial Conference "Environment for Europe" in Kiev in May 2003.

10. Ms. N. ALLEMAND (France) and Mr. B. CALAMINUS (Germany) clarified the mandate and work of the Expert Group on Techno-economic Issues for the coming two years. A first meeting had been held in April 2002, and a first sectoral panel meeting on waste incineration was held in June 2002. The Expert Group would collect and update data by the end of 2003, when the first results were needed by CIAM. Data available at the national level would be used, though the quality of data and the assessment of uncertainties were crucial. They stressed the importance of cooperation between the Ammonia Expert Group and the Expert Group on Techno-economic Issues in order to obtain cost data from as many Parties as possible on the priority sectors, recognizing that ammonia represented a small part of the overall data to be integrated into the RAINS model. It was recommended to hold the next meeting of the Expert Group on Ammonia Abatement jointly with the ammonia sectoral panel of the Expert Group on Techno-economic Issues, in order to streamline the work of the two groups dealing with ammonia.

III. AMMONIA EMISSIONS

A. Updating of EMEP/CORINAIR Guidebook (chap. 10)

11. Mr. U. DÄMMGEN presented the results of the recent work of the agriculture and nature panel of the Task Force on Emissions Inventories and Projections, in particular the modifications made to the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook in particular to chapter B1010. This chapter covered ammonia (NH_3), nitrous oxide (N_2O), other oxides of nitrogen (NO_x), carbon dioxide (CO_2), methane (CH_4), and non-methane volatile organic compounds (NMVOCs) from agricultural soils to which nitrogen (N)-containing fertilizers are applied, emissions from growing and decomposing fertilized plants, but not emissions following application of animal manure to land (SNAP code 100900, manure management); including NH_3 losses from grazed grassland (but not following manure spreading) but not including ammonia and nitrous oxide emission from grazed grassland due to decomposition of animal excreta applied to land (SNAP code 100100).

12. A subgroup of the agriculture and nature panel had further examined the Guidebook's section on ammonia losses from synthetic N fertilizer application, specifically the table presenting the influence of climate and soil type on NH_3 losses (based on the 1994 Report of the European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC)). Specific modifications agreed by the meeting and the delegation of tasks in updating the Guidebook are reflected in the annex. The revised chapter 10, incorporating all agreed changes, would be circulated to the Expert Group on Ammonia Abatement in advance of the next meeting of the Task Force in

Warsaw in September 2003. Participants were asked to contact Mr.U. DÄMMGEN with any further inputs or suggested modifications.

B. Particulate matter from agriculture

13. Little information was available regarding atmospheric emissions of particles from agriculture, although some known sources included plant production as well as feed management on the farm and housed livestock. The Conference on Particulate Matter (PM) in and from Agriculture, held on 3-4 June 2002 in Braunschweig, Germany, had examined effects, models and measuring techniques and their results. It had also identified that there were health effects, such as heart disease, from very small particles ($PM < 1\mu m$), and there was a need to look at fractions of airborne particles without consideration of origin or material. Information on impacts on human health came from doctors treating farmers.

14. There were two known preliminary ammonia emission inventories involving PM (Netherlands and United Kingdom) although many uncertainties remained. Better information and more sophisticated measurement techniques were needed. Mr. Z. KLIMONT (CIAM) said that CIAM was carrying out an assessment of the health effects of PM and pointed out that not only the health aspects but also the climate change aspects were important. The agriculture and nature panel would pursue this area further in future and proposed to be a nucleus to field questions on PM from agriculture. Mr. T. HINZ (Germany) volunteered to be a focal point to coordinate research on PM from agriculture within the panel and asked panel members to exchange contact details of those engaged in research in this field to create a network.

C. Pesticides, herbicides and other NMVOCs

15. Rough estimates of emissions from pesticides and herbicides were available according to their vapour pressure. Mr. U. DÄMMGEN would contact the German authority dealing with pesticides, BBA, to assess their approach to calculating emissions. Pesticide markets themselves had changed in recent years. As insufficient information was available to establish a simpler methodology to report on emissions of NMVOCs, the relevant Guidebook chapters would include a procedure to make a first estimate on the order of magnitude of these emissions, when the respective chapters were updated.

16. It was noted that most countries' inventories of methane from enteric fermentation were still in their infancy. Mr. DÄMMGEN offered to lead the work on the methane chapter (3.3.5) of the Guidebook, drawing on other countries' expertise, and to work on the first estimates of NMVOCs from agriculture.

D. Development of emission inventories

17. The meeting noted progress made in the development of inventories of ammonia emissions, particularly from agricultural sources, as demonstrated by presentations on inventories in Switzerland, Austria, the United Kingdom and the Netherlands. Improvements in inventory methodologies may significantly adjust current and projected emission totals. Mr. I. DAVIDSON emphasized that improvements in methodology were likely to lead to higher totals than those calculated at the time of negotiation of the ammonia emission ceilings in the Gothenburg Protocol, in particular where research identified additional sources. This information would be important to consider in the review of the Gothenburg Protocol.

IV. REVIEW OF GUIDANCE DOCUMENT ON CONTROL TECHNIQUES FOR PREVENTING AND ABATING EMISSIONS OF AMMONIA

18. The meeting discussed the updating of the Guidance Document (EB.AIR/1999/2, chap. V). The secretariat pointed out that all the guidance documents, including chapter V (involving sulphur, NO_x, VOCs, economic instruments and selected mobile sources), would be reviewed and updated, as part of the revision process of the Gothenburg Protocol, once it entered into force.

19. It was agreed that there was still scope for revision of the Guidance Document, particularly for housing. Mr. I. DAVIDSON recommended that subgroups of the Expert Group should collate comments and views, finalize the document and submit it to the Working Group on Strategies and Review at its next session in September 2003. Suggestions for modifications must thus be received by the secretariat by 1 June 2003, indicating the changes from the previous document.

V. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE WORK

20. The meeting agreed that:

(a) It would aim to link its future work more closely with the review of the Gothenburg Protocol, particularly regarding the 2010 targets for emission levels of ammonia;

(b) It was important to encourage countries to develop national codes of good agricultural practice based on the Convention's Framework Code for Good Agricultural Practice for Reducing Ammonia (EB.AIR/WG.5/2001/7), and it would aim to assess the degree to which this was taking place and how the Expert Group on Ammonia Abatement could best assist the process;

(c) Further work was needed on non-agricultural emissions of ammonia. Moreover, further research was needed on animal housing and storage, taking into account animal welfare and protection;

(d) It would finalize the proposed revisions to chapter V of the Guidance Documents

on Control Techniques and Economic Instruments to the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (EB.AIR/1999/2) and present this as an informal document (in English only) at the next session of the Working Group on Strategies and Review;

(e) In an effort to coordinate the work of the Expert Group with that of the Expert Group on Techno-economic Issues, especially regarding the costs of measures to abate ammonia emissions, it would hold its next meeting jointly with the Expert Group on Techno-economic Issues on 11-12 June 2003 in Paris. The joint meeting would aim to cover two levels of discussion: (i) default values for Europe and various abatement measures in the ammonia sector; and (ii) feedback on how to improve data applicability and efficiency in the coming years as a basis for modelling work;

(f) It would try to strengthen links with countries in Eastern Europe and Central Asia including, but not limited to, finding ways to increase their participation in meetings and workshops related to ammonia abatement. This should be reflected in the work-plan. For this, it would explore the possibility of holding a one-day meeting on ammonia during the next meeting of the Task Force on Emissions Inventories and Projections in Warsaw. The Expert Group would contact the Chairman of the Task Force to ensure that the next session allowed sufficient time for high-level scientific presentations, showing results of models on agricultural emissions (including ammonia), as well as work on the construction of emission inventories;

(g) Recognizing the large amount of information available on abatement techniques and the need to share it more widely among countries, it would examine the possibility of future work comparing countries' inventories, projections and abatement strategies;

(h) Recognizing the importance of cooperation with other groups, including the Task Force on Measurements and Modelling, it would consider future work comparing countries' measurement and modelling techniques and explore the possibility of holding a workshop on the status of modelling and monitoring strategies for Europe.

Annex

SPECIFIC MODIFICATIONS AND DELEGATION OF TASKS IN UPDATING THE
EMEP/CORINAIR EMISSION INVENTORY GUIDEBOOK

The delegation of tasks in updating the Guidebook were as follows:

Introduction: Antonio Ferreiro Chao, Ulrich Dämmgen (completed)

100100 Cultures with fertilizers: Annette Freibauer/ Pierre Cellier (discussed)

100200 Cultures without fertilizers: Annette Freibauer/Pierre Cellier (unchanged)

100300 Stubble burning: Roger Phillips

100400 Enteric fermentation: Roger Phillips/Ulrich Dämmgen (in progress)

100500 Manure management – carbon compounds: Ulrich Dämmgen (completed)

100600 Pesticides (unchanged)

100900 Manure management: Ulrich Dämmgen (completed)

101000 Particulate matter: Lenny Lekkerkerk (See T. Hinz)

Priority sections still requiring lead authors and contributing authors were: 100300 (Stubble burning); 100400 (Enteric fermentation); and 101000 (Primary particles). Progress made in updating chapter 100100 was discussed in plenary. Open questions remaining were discussed in a small working group (M. Sutton, P. Cellier, K. van der Hoek, Z. Klimont and J. Webb). L.C.F. Tan offered to proofread the manuscript. Sections indicated as completed can be accessed at: <http://www.tfeip-secretariat.org>.