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## Economic Commission for Europe

### Executive Body for the Convention on Long-range Transboundary Air Pollution

Steering Body to the Cooperative Programme for  
Monitoring and Evaluation of the Long-range  
Transmission of Air Pollutants in Europe (EMEP)

#### Thirty-fourth session

Geneva, 13–15 2010

Item 5 of the provisional agenda

**In-depth discussion of activities relevant to hemispheric  
transport and short-lived climate forcing of air pollutants**

## Hemispheric Transport of Air Pollution

### Report by the Co-Chairs of the Task Force on Hemispheric Transport of Air Pollution

#### I. Introduction

1. This report summarizes the activities of the Task Force on Hemispheric Transport of Air Pollution held in accordance with the workplan decided by the Executive Body (ECE/EB.AIR/99/Add.2, item 2.4). It is divided into four parts. Part I provides details on the workshop organized for the drafting of the Hemispheric Transport of Air Pollution (HTAP) 2010 assessment report and reviews of recent findings, held in Toronto, Canada, from 11 to 13 November 2009. Part II gives an overview of a second HTAP 2010 writers' workshop held in Chapel Hill, United States of America, from 1 to 3 March 2010. Part III is a report of the final review workshop for HTAP 2010 held in Brussels, Belgium, from 14 to 16 June 2010. The third workshop was combined with the sixth meeting of the Task Force and held in cooperation with the Global Atmospheric Pollution Forum (GAPF). Part IV describes the activities of the Task Force for the remainder of 2010 and the proposed workplan for 2011. The present report also summarises progress of work of the 2010 HTAP assessment and its executive summary, which aims to inform to the Convention of its finding on intercontinental transport of air pollution.

2. Further details of the Task Force workshops and activities may be found at <http://www.htap.org>.

## II. First writer's workshop on the HTAP 2010 report

3. The first writer's workshop on the HTAP 2010 report, hosted by Environment Canada in Toronto, from 11 to 13 November 2009, was attended by some 85 experts, including those from the following Parties to the Convention on Long-range Transboundary Air Pollution: Austria, Canada, the Czech Republic, the European Union, France, Germany, Italy, Norway, Spain, Switzerland, the United Kingdom of Great Britain and Northern Ireland and the United States of America. In addition, experts from the following countries not Party to the Convention attended: the People's Republic of China, India, Japan, Pakistan and Thailand. Representatives of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) Chemical Coordinating Centre (CCC) and the Meteorological Synthesizing Centre East (MSC-East) and West (MSC-West), as well as industry organizations, also participated.

4. Mr. T. Keating (United States) and Mr. A. Zuber (European Union), the co-Chairs of the Task Force, co-chaired the workshop.

### A. Workshop objectives

5. The workshop was organized by the Task Force to focus on the drafting of the 2010 HTAP assessment report through reviewing the policy-relevant science questions identified by the Task Force and the first rough drafts. The report was divided into three technical parts (A: Ozone and particulate matter (PM); B: Atmospheric mercury; and C: Persistent organic pollutants (POPs)) and a policymakers' summary (D: Synthesis). The workshop also reviewed the conclusions of the HTAP 2007 report and other recent reports, including the United States National Academy of Sciences report, *Global Sources of Local Pollution*.<sup>1</sup>

### B. Summary of the workshop

6. Lead authors of each chapter provided rough drafts or outlines of the report chapters addressing conceptual overview, observational evidence, emission inventories and projections, regional and global modelling, and health and environmental impacts. Breakout sessions worked through the details of the chapters and identified cross-cutting themes and key messages so as to foster consistency in organization and presentation of similar information. Participants:

(a) Took note that progress had been made in organizing the content of the report, but a number of issues needed to be addressed, such as harmonization in cross-cutting concepts (e.g., on uncertainty analysis) and nomenclature between chapters and parts. Furthermore, major gaps in the text still existed;

(b) Recommended that further work be done to harmonize the chapters, fill in the gaps, and update report drafts by late January 2010, in order to meet the overall deadline by September 2010.

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<sup>1</sup> Committee on the Significance of International Transport of Air Pollutants; National Research Council, *Global Sources of Local Pollution: An Assessment of Long-Range Transport of Key Air Pollutants to and from the United States* (The National Academies Press, 2009). Available from [http://www.nap.edu/catalog.php?record\\_id=12743](http://www.nap.edu/catalog.php?record_id=12743)

### III. Second workshop on the HTAP 2010 report

7. The second workshop, hosted by the United States Environmental Protection Agency (EPA) in Chapel Hill, United States, from 1 to 3 March 2010, was organized to review the first full drafts of the HTAP 2010 assessment and to discuss the findings and recommendations of each chapter. In conjunction with that workshop, the EPA organized a meeting on 4 and 5 March 2010 to explore the state of science regarding the short-lived climate forcing of air pollutants.

8. The workshop was attended by about 120 experts, including those from the following Parties to the Convention: Canada, the Czech Republic, the European Union, France, Germany, Ireland, Italy, the Netherlands, Spain, Switzerland, Ukraine, the United Kingdom of Great Britain and Northern Ireland and the United States of America. In addition, experts from the following countries not Party to the Convention attended: the People's Republic of China, India, Japan, Pakistan and Thailand. Representatives of EMEP MSC-East and MSC-West and the Centre for Integrated Assessment Modelling (CIAM), as well as industry organizations, also participated.

9. Mr. T. Keating (United States) and Mr. A. Zuber (European Union), co-chairs of the Task Force, co-chaired the workshop.

#### A. Workshop objectives

10. The workshop was organized by the Task Force to review the first full drafts of the 2010 report and to discuss further results and analyses from the HTAP model intercomparison. In addition, the workshop sought to make a first draft of the storylines for each of the parts of the 2010 assessment.

#### B. Summary of the workshop

11. Lead authors of each chapter provided drafts for discussion, although not all chapters were complete. Breakout sessions worked through the details of the chapters and cross-cutting themes and drafted answers to the synthesis questions posed by the co-Chairs to foster consistency in organization and presentation of similar information. Participants:

(a) Took note of the progress made and in particular of the draft answers to the synthesis questions that were based on the policy-relevant science questions identified by the Task Force at its first meeting in 2005;

(b) Recommended that a sixth chapter be added to each technical part (A to C) to bring forward and synthesize the findings and recommendations contained in each chapter.

12. Presentations of recent findings from the HTAP model intercomparison and other studies showed how modelling could provide a view of future air quality, including intercontinental transport of air pollution. Participants:

(a) Took note of the projections for future air pollution from shipping, and the policy action by the United States and Canada to create a specific nitrogen oxide emissions control area (NECA) for shipping in the vicinity of those States. The participants also took note of efforts to use the results of source-receptor sensitivity analyses to linearly approximate the tropospheric ozone response to emission changes in volatile organic compounds (VOCs), nitrogen oxide (NO<sub>x</sub>), and carbon monoxide (CO); and

(b) Recommended that the Task Force pursue and deepen the analysis that could inform the Convention on the response of changes in emissions in all sectors and all regions and form the basis for future policy.

#### **IV. Report review workshop and sixth meeting of the Task Force**

13. The report review workshop was organized by the Task Force and hosted by the European Commission in Brussels, from 14 to 16 June 2010. One session was organized jointly with GAPF.

14. The workshop was attended by more than 75 experts. Participants came from the following Parties to the Convention: Belgium, Canada, Croatia, the Czech Republic, the European Union, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom of Great Britain and Northern Ireland and the United States of America. From outside the United Nations Economic Commission for Europe (UNECE) region, experts from Brazil, China, India, Japan, Mexico, Nigeria, Nepal, Pakistan, Thailand, Tunisia and Zimbabwe participated. Representatives of the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), CCC, MSC-W and MSC-E and industry organizations also participated.

15. The workshop was co-chaired by Mr. T. Keating (United States) and André Zuber (European Union), co-Chairs of the Task Force.

##### **A. Workshop Objectives**

16. The specific objectives of the workshop were to:

(a) Review and agree upon the principal policy relevant conclusions and recommendations of the HTAP 2010 assessment report describing the intercontinental transport of ozone, aerosols, mercury, and POPs;

(b) Discuss future directions for cooperation on air pollution issues at the hemispheric and global scales, in general, and the work of the Task Force, in particular. The exploration of future directions was organized in cooperation with GAPF.

##### **B. Summary of conclusions**

17. The participants reviewed the status of the draft 2010 HTAP assessment. They noted that most of the chapters were close to completion but some gaps still remained. They also noted that further effort was needed to clarify the findings and recommendations in each chapter that would be brought forward to the summary chapters and synthesis for policymakers.

18. The participants agreed that an integrated policymakers' summary (comprising Part D of the HTAP 2010 report) should be drafted to describe:

(a) The observational evidence for the intercontinental transport of ozone, PM, mercury, and POPs in the Northern Hemisphere, focusing on observed trends in remote locations, as well as observations of transport events or plumes and satellite observations;

(b) For each pollutant, the fraction of observed concentrations and deposition that was due to intercontinental transport associated with anthropogenic emissions, as distinguished from local and regional anthropogenic or natural emissions sources;

(c) The sensitivity of air pollution concentrations or deposition in one region of the world to changes in current emissions in other regions;

(d) The impact of intercontinental or global flows of pollutants on the ability to achieve policy objectives identified by the Convention, national Governments and international organizations;

(e) The contribution of intercontinental or global flows of pollutants to impacts on human health, natural and agricultural ecosystems and near-term climate change, with a specific discussion of impacts in the Arctic;

(f) The effect of changes in emissions and climate over the next 20 to 40 years on intercontinental transport;

(g) The sources of uncertainty in estimates of intercontinental flows, based on the ability of current models and emission estimates to reproduce the magnitude, spatial patterns and temporal trends in observed concentrations and deposition;

(h) The further efforts needed to improve understanding of intercontinental transport and its impacts and the ability to assess those flows, including the development of an integrated system of observational data, emissions and models.

19. The chapter lead authors agreed to revise their chapters to provide the information for that summary for policymakers. The participants agreed that the editors, with input from the chapter lead authors, would draft the summary for policymakers in line with the guidance provided by the Task Force. In addition, the co-Chairs would draft an executive summary highlighting the main policy-relevant findings to inform the Convention and other international bodies about the relevance of intercontinental transport of air pollutants. The co-Chairs intended to present a draft of that executive summary to the EMEP Steering Body as an informal document for discussion at its thirty-fourth session and to finalize it for the Executive Body's twenty-eighth session.

20. The joint discussion between the Task Force and GAPF on future cooperation on global and hemispheric scales concluded that:

(a) Progress had been made in expanding regional cooperation on air pollution issues in other regions outside the Convention, and largely facilitated by the efforts of GAPF. The participants noted the diversity of the regional frameworks that had been established and the interests in connecting air pollution policies to policies addressing climate change, human health, biodiversity, food security, urban planning, transportation, energy and development;

(b) Important contributions had been made by WMO, the Group on Earth Observations (GEO), the International Geosphere-Biosphere Programme (IGBP), UNEP and the Convention in coordinating global efforts on monitoring, research and information exchange. The participants identified strengths and weaknesses of different institutions and needs and opportunities for new institutional approaches;

(c) Outreach efforts of the HTAP Task Force had strengthened existing connections to WMO, GEO, IGBP, UNEP and other regional networks, including the Acid Deposition Monitoring Network in East Asia (EANET) and the Malé Declaration. The resulting network of experts and exchange of information had helped advance the state of science. The participants encouraged continued efforts to bring those communities together through Task Force or other international bodies;

(d) There were needs and opportunities for broader interregional cooperation on both science and policy issues. The participants recognized the global nature of air pollution problems, in terms of the common causes, impacts, and solutions for air pollution

in different regions of the world, as well as the impact of transboundary transport from one region to another;

(e) Emission inventories were fundamental for air quality management, but the quality of available emission information for many regions was poor. The Convention had strong capabilities in the area of emission inventory development that could be used to improve capacity in other regions. In turn, the Convention would benefit from the availability of improved emission information from other regions;

(f) Assessment of air pollution impacts was important for establishing the case for transnational or global action on air pollution and engaging decision makers outside the Convention. The participants noted that the HTAP 2010 report would make a contribution to the characterization of impacts from intercontinental transport, but that further work was needed;

(g) It was important to consider both the co-benefits and trade-offs associated with mitigating emissions that contributed to both air pollution and climate change;

(h) The enhancement of air quality science and management capacity was needed in all regions of the world. There might be cases where regional cooperation was more effective, for example, in increasing management capacity, due to regional similarities in the causes of air pollution. There might be other cases where a more global approach would be more effective, such as for research, air quality assessments and monitoring that required a high degree of harmonization in methods and scientific understanding.

## **V. Activities for the remainder of 2010 and draft workplan for 2011**

21. The main task for the remainder of 2010 would be to finalize the HTAP 2010 report in all parts (A: Ozone and PM, B: Mercury, C: POPs and D: Synthesis) and to ensure that the key messages of these report and the executive summary were conveyed to the Convention and its subsidiary groups as well as to other relevant organizations dealing with regional and global air pollution. A workshop scheduled for autumn 2010 would be shifted to spring 2011.

22. The main activities and time schedule proposed for 2011 were to:

(a) Pursue efforts for an increased understanding of the role of hemispheric transport of air pollution and in particular to:

(i) Continue to plan, conduct and analyse multi-model experiments to evaluate the importance of intercontinental transport of air pollution and in particular the linkages to short-lived climate forcers (particularly methane and black carbon) and climate change in conjunction with other internationally coordinated studies;

(ii) Support the development of an electronic information network, to facilitate the integration and interoperability of relevant data on emissions, observations and modelling information for the assessment of intercontinental transport (including the HTAP Modelling Data Server, EDGAR-HTAP, EBAS-HTAP, and GIOVANNI-HTAP) and to make available for all interested parties, task forces and EMEP centres data and tools related to the 2010 assessment;

(iii) Improve the linkages between modelling efforts at the global and regional scales;

(b) Organize an annual meeting and workshop jointly with other international organizations (WMO, UNEP, GEO, IGBP, GAPF) to discuss the findings of the 2010 HTAP assessment and other recent related assessments and discuss plans for continued work, tentatively in May 2011;

(c) Continue the cooperation with the EMEP centres and individual Convention task forces, including the Task Force on Measurements and Modelling, the Task Force on Reactive Nitrogen, the Task Force on Integrated Assessment Modelling and the Task Force on Emission Inventories and Projections;

(d) Continue and increase outreach efforts directed at experts in countries outside the UNECE region and international organizations dealing with global and regional air pollution.

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