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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)  
(Twenty-eighth session, Geneva, 6-8 September 2004)

**EMISSION INVENTORIES AND PROJECTIONS**

Progress report by the Co-Chairmen of the Task Force,  
prepared in consultation with the secretariat

**Summary**

The Task Force on Emission Inventories and Projections met on 22-24 September 2003 in Warsaw. The meeting was the fourth to be organized jointly with the European Environment Information and Observation Network (EIONET) maintained by the European Environment Agency (EEA). The Task Force considered the status of emission reporting to the Convention during the 2003 reporting round (2001 data), the first data submitted according to the Emission Reporting Guidelines adopted by the Steering Body at its twenty-sixth session. The Task Force aimed to restructure its work along specific themes, namely: inventory review and improvement, and the management of the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook. Expert panels addressed technical and reporting issues related to: agriculture and nature, transport, combustion and industrial emissions, and review of inventories. The Task Force considered its work-plan, discussed its future priorities, and addressed the scientific and strategic issues that had an impact on its work, some of which were highlighted in a poster session.

## Introduction

1. The twelfth meeting of the Task Force on Emission Inventories and Projections, the fourth to be held jointly with EIONET, took place in Warsaw from 22 to 24 September 2003. One hundred and four experts from 34 Parties to the Convention attended. The Parties represented were: Austria, Belarus, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States of America, and European Community.
2. The cooperating bodies of the European Commission present included: the European Commission (Directorate General on Environment), the European Environment Agency (EEA) and its European Topic Centre on Air and Climate Change (ETC/ACC) and the Joint Research Centre (JRC). Representatives of the United Nations Framework Convention on Climate Change, the Meteorological Synthesizing Centres East and West (MSC-E and MSC-W), the Chemical Coordinating Centre, the Centre for Integrated Assessment Modelling (CIAM), the UNECE secretariat, the Technical Support Unit for the Intergovernmental Panel on Climate Change (IPCC) National Greenhouse Gas Inventories Programme, located at the Institute for Global Environmental Strategies (Japan), also attended. Industrial organizations also participated.
3. Mr. M. Woodfield (United Kingdom) and Mr. A. Barkman (EEA) co-chaired the meeting. Mr. Woodfield stepped down at the close of the meeting, informing the Task Force that Norway had offered to take over as lead country. Ms. K. Rypdal (Norway) was nominated by Norway to chair the Task Force. She would be supported in Task Force activities by the Norwegian Pollution Control Authority, in cooperation with Mr. Barkman.
4. Mr. M. Sobiecki, Director of Environmental Policy Development, Ministry of Environment of Poland, welcomed the participants, and informed the Task Force about Poland's environmental policy, of which air quality was an important part. Mr. Zareba, Chief Inspector for Environmental Protection of Poland, noted his country's environmental plan aimed to reduce energy use and to encourage renewable energy resources. In addition, Poland had adopted a national strategy to reduce heavy metals and persistent organic pollutants (POPs), a first step toward the ratification and implementation of the Protocols on Heavy Metals and POPs.
5. Mr. M. Woodfield pointed out that the overall objective of the Task Force was to assist Parties in reporting on emissions under the Convention and its protocols, as well as to act as a scientific peer review body. He recalled that, at its previous meeting, the Task Force had decided it should refocus its resources on the exchange of scientific information and the review and assessment of emission inventories, in response to the needs of the Convention as reflected in its work-plan (ECE/EB.AIR/77/Add.2, section 2.1). As much progress had been made on the

development of guidance and reporting mechanisms, the Task Force should now devote its work toward the review and assessment of data and the management and updating of the Guidebook, in an effort to obtain high-quality emission inventories.

## **I. CONCLUSIONS AND RECOMMENDATIONS TO THE EMEP STEERING BODY**

6. The Task Force:

(a) Given the progress made in cooperation between the Parties and EU member States, proposed to continue to meet together with EIONET to strengthen the joint network of experts and avoid duplication;

(b) Took note of the need to reflect user experience of the Guidelines and Guidebook and agreed to convene an editorial group, reporting to the Task Force, to manage the process of collecting feedback, identifying editorial changes required, and facilitating solutions; the editorial group would be led by the Task Force's Chairperson;

(c) Adopted the report of the workshop on validation and evaluation of air emission inventories (14-16 October 2002, Gothenburg, Sweden) and agreed, in keeping with the draft work-plan for the convention (EB.AIR/2003/4), to establish an inventory improvement programme, to be guided by a new expert panel on review, led by Sweden and EEA, and in cooperation with JRC;

(d) Agreed the need to perform a periodic review process, to take place as part of the inventory improvement programme, and further agreed to consider basing it on review procedures and mechanisms to be drafted by an expert panel on review. It agreed to submit proposals for procedures and mechanisms to improve emission inventories to the Steering Body at its twenty-ninth session in 2005;

(e) Agreed to take action to improve emission factor information on particulate matter (across all sectors), including chemical speciation, particle size and number;

(f) Welcomed the offer of JRC to establish an emission factor database for combustion and industrial emission sources and to arrange scientific workshops to address issues identified in the above-mentioned inventory improvement programme. These workshops would be held, when possible, in conjunction with the annual meeting of the Task Force;

(g) Expressed satisfaction that the new Emission Reporting Guidelines had facilitated reporting by many Parties, although some technical and policy issues still had to be resolved;

(h) Agreed it would seek to facilitate Parties' reporting of emissions and projected activity data to the Convention by including emission factors related to technologies in the Emission Inventory Guidebook and reviewing their completeness. The Task Force proposed collaboration with the Task Force on Integrated Assessment Modelling with respect to projection methodology development;

(i) Recognized the importance of considering abatement technologies and their implementation in the submission of informative inventory reports and invited participation at its next meeting from the Convention's Expert Group on Techno-economic Issues and input from the European Commission's project on emerging technologies;

(j) Noted that much work of relevance to the Task Force was being conducted by cooperating bodies and that greater efforts could be made to align its working practices with those of other bodies. Consequently, the expert panels would define their future work in project areas that could be shared with other groups including the United Nations Framework Convention on Climate Change, IPCC, Clean Air for Europe (CAFE) programme and the European Pollutant Emission Register (EPER)/pollutant release and transfer registers (PRTR) communities, and managed accordingly.

## **II. PROGRESS REPORT**

### **A. Status of submissions for 2003 reporting (2001 data)**

7. The Task Force considered the Convention's data requirements for EMEP, as presented by Ms. L. Tarrason (MSC-W), and the status of emission reporting under the Convention for 2003 reporting (2001 data), as presented by Ms. V. Vestreng (MSC-W). Since Parties had the option this year of reporting according to either the new Guidelines (EB.AIR/GE.1/2002/7 and Corr.1) or the previous ones (EB.AIR/GE.1/2001/6), it was commendable that, despite the considerable amount of work required by the revised reporting framework, the number of submission received before the deadline had improved over last year. Thirty-six Parties out of 49 (73%) reported by 31 March 2003. Twenty-nine Parties of a total 49 (59%) reported on time (by 15 February 2003), compared to 16 out of 48 last year. Twenty-one reported according to the new format. Ms. Vestreng explained the use and purpose of a new data verification tool developed by MSC-W (REPDAB) and described its proposed updates.

8. The Task Force appreciated the use of REPDAB (<http://webdab.emep.int/repdab.html>) for checking the format, completeness and consistency of data submissions in accordance with the Emission Reporting Guidelines for reporting to the Convention, while noting that certain modifications could make the system more user-friendly.

## B. Reporting on heavy metals, particulate matter (PM) and POPs

9. As in the previous reporting round, improvements continued to be seen in reporting on heavy metals, particulate matter and POPs, though further improvement was needed in data quality, particularly important since the Protocols on POPs and on Heavy Metals would soon enter into force. Of the 36 Parties reporting, 31 reported on at least one priority metal (cadmium, lead and mercury), with 25 Parties reporting on all priority metals and 23 reporting on at least one additional metal (arsenic, chromium, copper, nickel, selenium, zinc). Twenty-five Parties reported on at least one type of particulate matter (PM<sub>2.5</sub>, PM<sub>10</sub>, total suspended particulate (TSP)), while only 11 Parties reported on all three. Ten Parties reported on all three priority metals and on all three particulates (PM<sub>2.5</sub>, PM<sub>10</sub>, TSP): Austria, Belgium, Denmark, Finland, France, Hungary, Netherlands, Norway, Poland and Sweden.

## C. Liaison with other international organizations

10. Mr. S. Jacobi (European Commission) described the current reporting under the European Commission's National Emission Ceilings (NEC) Directive. He said several Parties had met the NEC deadline of 31 December 2002 for reporting, though all reports on emission and projections were delivered by end-June 2003. He noted that timely data were essential in order to keep the schedule for the CAFE programme and to avoid a delay in the development of the Commission's thematic strategy on air pollution.

11. Mr. K. Tanabe (IPCC) reported on the work of the Intergovernmental Panel on Climate Change. He said that work was commencing on revising the IPCC Guidelines for all sectors, to be finalized in 2005.

12. Mr. J. Goodwin (ETC/ACC), presented results of the 2003 pilot inventory improvement review. Mr. Z. Klimont (CIAM) described work under way to review the submissions by selected Parties of 2001 data. This involved an in-depth review of consistency and accuracy and involved bilateral consultations with experts. He noted that the quality of emissions had dramatically improved. However, lack of documentation was problematic and experts were thus encouraged to submit informative inventory reports, as stated in paragraph 38 of the Guidelines. These reports should include, inter alia, information on methodologies, uncertainties and assumptions, and should indicate if any quality control or quality assessment had been done on the submission.

## D. Publication of the Emission Reporting Guidelines

13. It was recalled that, following the adoption of the Emission Reporting Guidelines by the Steering Body at its twenty-sixth session, an editorial group was tasked with considering technical adjustments proposed by Parties.<sup>1/</sup> The Task Force considered various problems and discrepancies that had arisen during the 2003 reporting round and proposed solutions (see annex).

The finalized Guidelines would be published in the Air Pollution Studies series (No. 15) and would be opened for revision in 2007, at the latest.

14. The Task Force felt that the combination of the Guidelines, REBDAB, the inventory review programme and the submission of informative inventory reports would go a long way toward improving inventories in the coming years.

#### E. Reports from expert panels

15. ***Expert panel on review.*** The Task Force discussed the administrative and technical basis for the work on inventory review and assessment of emissions reported under the Convention and the European Commission's NEC Directive and agreed to replace the former expert panel on review and projections with a new expert panel on review. The new panel should have overall responsibility for driving the review process, which should be carried out by an expert review team. This would be made up of representatives of MSC-W, MSC-E, CIAM, the secretariat, ETC/ACC and JRC. Further work was needed to identify members of the expert review team and to evaluate proposals for the review procedures that were developed during the Task Force's meeting.

16. The main tasks of the expert panel should be to:

- (a) Propose procedures for review of inventories serving both the Convention and the NEC Directive, including work to be done by the expert review team;
- (b) Develop with the expert review team methodologies for review;
- (c) Help to evaluate the work of the expert review team;
- (d) Evaluate review processes in other conventions in order to improve reviews under the Convention and the NEC Directive;
- (e) Develop a standardized format for an informative inventory report, as specified in paragraph 38 of the Emission Reporting Guidelines; and
- (f) Share experiences among Parties on quality assessment/quality control and inventory improvement.

17. The Task Force proposed that the review methodology should be two-tiered. Tier 1 should involve automatic consistency and accuracy tests (dips, jumps, gaps). This should begin by an assessment of the Parties' submission, REPDAB verification tests and other automated tests, consultations with Parties and expert discussions on questions, problems and discrepancies. Tier 2 should aim to look at the roots of the problems encountered, requiring a more detailed evaluation and recommendations for improvement and assessment of implied emission factors.

18. Outputs of the review may include: a list of questions to be posed to Parties' experts, accessible through WEBDAB (password protected); documentation of responses from these experts; and a synthesis and assessment report, as an annex to the Joint MSC-W/ETC-ACC report on emissions published by 15 July.

19. The following time frame for the review process was proposed:

**15 February:** Data submission due by Parties;

**15 Feb – 1 March:** Initial data checking for completeness and consistency (secretariat and MSC-W);

**1 March – 1 April:** Review process initiated by expert review team (who would report to the Task Force's expert panel on review);

**1 April – 1 May:** Bilateral discussions with the Parties' nominated experts. Any final modifications by Parties must be received by 1 May to be reflected in "Present State of Emission Data" (EMEP Steering Body document) and "Status Report on Emission Data Reported to the Convention" (MSC-W report);

**1 May-15 June:** Review of data, taking into account comments and/or revisions submitted by Parties;

**15 June:** Deadline for submission of data tables, graphs and notes by MSC-West to the secretariat for preparation of EMEP document "Present State of Emission Data";

**15 June-15 July:** Preparation of "Status Report on Emission Data Reported to the Convention" (MSC-W) for presentation to EMEP Steering Body and CAFE;

**September:** Data and status reports submitted to EMEP Steering Body for endorsement;

**October:** Task Force meeting held to consider results of review process and discuss methodological problems that arose during the last reporting round;

**December:** Data and status reports submitted to Executive Body for approval.

20. The Task Force proposed that the modalities of the review programme should be discussed at the first meeting of the expert panel on review, expected to be held in early 2004.

21. ***Expert panel on combustion and industry.*** The expert panel on combustion and industry reported on progress made since the previous meeting of the Task Force on the revision of the solvent-related chapters in the Emission Inventory Guidebook. The panel found that the majority of solvent-related chapters were written when emissions of heavy metals and POPs were not yet

incorporated into the emission reporting programme under EMEP. Some chapters therefore needed additions for these substances and some chapters might need to be rewritten and updated. The panel recommended specific actions and delegation of tasks for each chapter, and would report to the Task Force at its next meeting.

22. **Expert panel on transport.** The expert panel on transport discussed the updating of the transport-related chapters of the Emission Inventory Guidebook and considered a new chapter on non-exhaust particulate matter (road vehicle tyre and brake wear, road surface wear). Moreover, it considered information on air pollution and fuel consumption of combustion engines in off-road equipment and machinery, presented by the German Federal Agency for the Environment. This showed an increasing share of off-road equipment and machinery emissions in total transport emissions (almost 50% for PM and NO<sub>x</sub>). The chapter on off-road emissions needed updating. The panel was also informed about developments regarding existing and future particulate matter emissions, including a particulates project on the characterization of exhaust particulate emissions from road vehicles, to be finalized by the end of 2003, with a database and information available at: <http://vergina.eng.auth.gr/mech/lat/particulates>.

23. **Expert panel on agriculture and nature.** The expert panel on agriculture and nature discussed the updating of chapter 10 in the Emission Inventory Guidebook, including chapter B1010 on emissions from cultures with fertilizers (100100); chapters B1040 (enteric fermentation, SNAP 100400) and B1050 (manure management – organic compounds, SNAP 100500) with a detailed methodology for methane. Certain sections had been rearranged and a new introductory chapter (B1000) had been written. As a result, chapters B1010, 1020, 1040, 1050 and 1060 had been amended and updated and a new chapter B1090 (manure management regarding nitrogen compounds) had been written. Moreover, chapters B1010, 1020, 1040, 1050 and 1090 would be amended and updated to include information reflecting the situation in the EU accession and Mediterranean countries. As for future work, the panel would continue to develop a chapter on emissions of particles (101000). It was agreed that the panel would not follow a compound approach but would extend and intensify its present sectoral approach. Nitrogen and carbon mass flows would be integrated to assess the emissions of CH<sub>4</sub>, NMVOCs, NH<sub>3</sub>, NO, N<sub>2</sub>O and N<sub>2</sub> for each step of the agricultural production process simultaneously. The panel would aim to cooperate further with the other panels on inventories of particulate matter and would continue work on non-agricultural sources of ammonia related to animals. A workshop on agricultural emission abatement options would be held in conjunction with the Expert Group on Ammonia Abatement on 29 April – 1 May 2004 in Poznan (Poland).

### III. OTHER ITEMS

24. **EMEP contributions in kind.** Mr. S. Kakareka (Belarus) presented the annual (2002) contribution in kind of his country to EMEP<sup>2/</sup> submitted through MSC-E. The Task Force

appreciated the report as a valuable contribution. Mr. Kakareka also presented material, issued in collaboration with MSC-E, on his country's contributions in kind to EMEP from previous years.<sup>3/</sup> This was devoted to POP emission source identification, testing and estimation, with an emphasis on the technological specificity in the Commonwealth of Independent States and would be a useful addition to the Guidebook.

25. The Task Force thanked Mr. Woodfield for his work as its Chairman over the past years and welcomed the new Chairperson Ms. Kristin Rypdal (Norway). Mr. Andreas Barkman (EEA) would act as Co-Chair, representing EIONET, and supporting the Chair as necessary in the work of the Task Force. The Co-Chairs thanked the Government of Poland for its generous support of the Task Force's meeting in Warsaw and expressed their appreciation for the excellent organization.

26. The Task Force agreed to hold its next meeting and an associated EIONET workshop on 19 - 20 October 2004, preceded by a scientific seminar on PM Emission Inventories (18 October 2004). Both meetings will be hosted by the Joint Research Centre in Ispra (Italy).

#### Notes

<sup>1/</sup> The editorial process will be led by the Chairperson of the Task Force (Ms. K. Rypdal), with the assistance of the secretariat, Mr. C. Dore (United Kingdom), Mr. J. P. Fontelle (France), Ms. G. Hammar skjold (Sweden), CIAM and MSC-W.

<sup>2/</sup> "Preparation of addition and refinements to the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook regarding heavy metals emission in view of peculiarities of the CIS countries technologies".

<sup>3/</sup> "Persistent Organic Pollutants: Sources and Emission Estimation".

Annex

**Proposals for resolving issues that arose in the use of the Emission Reporting Guidelines**

The Task Force discussed various issues that had arisen in the reporting of data by experts using the new Emission Reporting Guidelines. The main issues and proposals for how to resolve them are listed below.

**(a) There are discrepancies between reporting tables in Guidelines and those under the United Nations Framework Convention on Climate Change**

*Issue:* Sweden commented that reporting tables could not be converted to PDF format and thus were difficult to view, print or present. Aggregation rows were confusing and should be coloured or separated to show distinction and allow for easier summing of totals. It was time-consuming to enter data because it was not possible to copy and paste from other cells. For quality assessment/quality control, it was difficult to compare results between the Convention and the United Nations Framework Convention on Climate Change because of inconsistencies.

*Solution proposed by the Task Force:* Sweden would identify areas where reporting tables in the Guidelines and those used under the United Nations Framework Convention on Climate Change were inconsistent and notify the UNECE secretariat. MSC-W would consider the user-friendliness of the reporting templates (based on the reporting tables in the Guidelines). Quick solutions that could be addressed over the short term would be found for the upcoming reporting round; more time-consuming changes would be proposed for the next reporting round.

**(b) The Nomenclature for Reporting (NFR) in certain places does not include a sufficient breakdown of source categories for some pollutants (especially for non-methane volatile organic compounds (NMVOCs), POPs, heavy metals (HMs) and PM)**

*Issue:* This presents a problem because source categories for certain pollutants will not be sufficiently disaggregated for Parties to allocate emissions appropriately.

*Solution proposed by the Task Force:* The editorial group would identify where additional splits in NFR categories were needed (e.g. under solvent use for VOCs), bearing in mind that only a limited number of new categories should be introduced, and present it to the Task Force at its next meeting.

**(c) Few Parties (five) submitted informative inventory reports (para. 38 of the Guidelines);**

*Issue:* Paragraph 38 of the Guidelines encourages Parties to submit informative inventory reports indicating methodologies used, assumptions, uncertainties, recalculations and quality assessment/quality control (QA/QC) applied. The reports should be submitted within three months after data are submitted (by 15 May). Only five Parties submitted these reports in the 2003 reporting round. Parties needed to be more strongly encouraged to submit this information, considered essential for inventory review.

*Solution proposed by the Task Force:* MSC-W and the expert panel on review, in cooperation with the secretariat, would develop a simple format to assist Parties in their submission of informative inventory reports, prioritizing the required information, and submit this to the Task Force at its next meeting. An attempt would be made to assess the obstacles or problems in providing these reports. It was suggested that the reports should, if possible, also include information on abatement techniques and their implementation.

**(d) There was a lack of clarity regarding how to report the allocation of emissions on the territory of a Party (national totals vs. overseas totals)**

*Issue:* The reporting tables in the new Guidelines do not separate “national totals” from “protocol totals” as was the case in the previous reporting tables. Spain, France and other Parties have inquired whether their national totals should include emissions from the main national territory only or also include overseas territories or outlying areas.

*Solution proposed by the Task Force:* The UNECE secretariat would prepare a short note on the problem for the Implementation Committee to elicit an opinion on the treatment of the geographic area for purposes of emission reporting and compliance. As this might not produce immediate results, Parties were encouraged to report emissions for both “all national territory” and “the territory within the EMEP domain of calculation” in national emissions tables and provide gridded data only within the EMEP area.

**(e) There was confusion in the treatment of mobile sources, including aircraft emissions, inland shipping and calculation of emissions (fuels sold vs. fuels consumed)**

*Issue:* The Task Force recognized that the new Guidelines might imply in some cases different national emission totals than those derived from the former guidelines due to the different treatment of fishing and inland shipping emissions and of aircraft emissions. The difference between national totals may have consequences for compliance, in particular with the Gothenburg Protocol and also the NEC Directive. An official letter explaining the issue was sent by the

Netherlands to the UNECE secretariat and was circulated to the Steering Body at its twenty-seventh session (5-7 September 2003).

*Solution proposed by the Task Force:* The Chairman of the Task Force and MSC-West would draft a note for the secretariat to transmit to the Implementation Committee to present the origin of inconsistencies between the 1997 Guidelines and the 2002 Guidelines. The Implementation Committee could then assist the secretariat with an official reply to the letter from the Netherlands. The European Commission should also be made aware of the content of this letter as the compliance consequence for the NEC Directive may be similar to that for the Gothenburg Protocol. The Task Force acknowledged that it had to accept certain discrepancies between data reported under the Convention and the NEC Directive, but would aim to narrow the gap. Although some experts proposed using the Guidebook to clarify the situation, it was seen as a policy issue that required further consideration when revising the NEC Directive and the Gothenburg Protocol. The current reporting system using memo items may be used to construct data sets for different purposes.

**(f) There were certain technical and editorial problems in the reporting tables, as well as an inconsistency in the use of notation keys between the Guidelines and reporting under the United Nations Framework Convention on Climate Change**

*Solution proposed by the Task Force:* These would be addressed by the editorial group, which would communicate by e-mail, attempt to resolve issues by consensus and delegate responsibility for rectifying problems, both immediate and over the longer term. The technical and editorial problems in the reporting tables would be corrected before the Guidelines were printed in the Air Pollution Studies series.