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Item 4 of the provisional agenda

PARTICULATE MATTER

Report of the first meeting of the Expert Group on Particulate Matter, prepared by the Co-Chairs in collaboration with the secretariat

Introduction

1. The first meeting of the Expert Group was held in Berlin, on 23 and 24 May 2005, back to back with the thirtieth meeting of the Task Force on Integrated Assessment Modelling.
2. The meeting focused on discussing the relevant sources contributing to the transboundary transport of particulate matter (PM); assessing future changes in PM emissions and concentrations, as related to existing protocols to the Convention and other instruments; identifying technical and non-technical measures available for further reduction of PM levels, and initiating a discussion on an adequate strategy to address PM under the Convention.
3. Experts from Austria, Belgium, Bulgaria, Canada, Czech Republic, Estonia, the European Community, Finland, France, Germany, Hungary, Italy, Latvia, the Netherlands, Norway, Poland, Russian Federation, Serbia and Montenegro, Spain, Sweden, Switzerland, the United Kingdom and the United States attended the workshop. Experts from the EMEP Meteorological Synthesizing Centre West (MSC-W), the Meteorological Synthesizing Centre East (MSC-E) and

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the Centre for Integrated Assessment Modelling (CIAM) participated. The Working Group on Strategies and Review, the Steering Body to EMEP, the Task Force on Integrated Assessment Modelling, the Task Force on Heavy Metals, the Task Force on the Health Effects of Air Pollution, the Expert Group on Techno-economic Issues and the Task Force on Emission Inventories and Projections were represented. Representatives of the World Health Organization (WHO), the European Environment Agency as well as the Oil Companies' European Organization for Environment, Health and Safety (CONCAWE) and the Union of the Electricity Industry (EURELECTRIC) also attended. The UNECE secretariat was represented.

4. The meeting was chaired by Ms. M. Wichmann-Fiebig (Germany) and Mr. M. Meadows (United Kingdom). They noted that presentations made at the meeting and links to the background documentation would be available on the Internet at: <http://www.unece.org/env/pm/meetings.htm>.

5. In their introductory presentations, Mr. K. Bull (UNECE secretariat), Mr. R. Ballaman (Switzerland), Chair of the Working Group on Strategies and Review, Ms. Wichmann-Fiebig and Mr. Meadows provided an overview of the terms of reference of the Expert Group, highlighting in particular the need to report conclusions and recommendations to the Working Group on Strategies and Review and to draw up a plan for future work including a workplan for 2006. Mr. Ballaman also outlined possible options for future controls. The Expert Group recognized its work was scientific and technical but that its conclusions and recommendations would be important for helping policy makers with future decisions on emissions controls.

6. Mr. M. Krzyzanowski (WHO), Chair of the Joint Task Force on Health, summarized results of studies on the health impacts of PM. The Expert Group noted that reports on PM were available from the WHO website (<http://www.euro.who.int/ecehbonn>) including the results of the systematic review of health effects of PM. It noted the strengthened evidence showing links between relative risk of mortality and levels of PM_{2.5}, while remarking that PM₁₀ is not innocuous. It was noted there was no evidence for a threshold of effects at the population level. The Group recognized that even in 2010 there would be significant mortality associated with PM levels and there was a need for further policy action. While there was a strong body of evidence linking health effects to PM, there was a lack of information on which components of the PM were responsible for the effects.

I. SUMMARY OF MAJOR DISCUSSION POINTS

A. Relevant sources contributing to the transboundary transport of PM

7. Ms L. Tarrason (MSC-W) described the status of the monitoring and modelling work of EMEP coordinated by MSC-W and the Chemical Coordinating Centre of EMEP. The Expert Group noted exceedances of air limit values across Europe but also the lack of monitoring sites,

the general underestimation of models and annual variability due to meteorology. It noted that models showed the transboundary character of not only secondary PM_{2.5} but also primary PM_{2.5} and to a lesser extent PM₁₀. Mr. Meadows provided relevant information from the 2004 position paper on PM prepared under the European Commission's Clean Air for Europe (CAFE) programme. The Expert Group noted that focus had been on trends, achievability of targets as well as future possible metrics for targets (i.e. PM₁₀ or PM_{2.5}). It noted the conclusions of the position paper were of relevance to the Expert Group's work.

8. Mr. A. Ryaboshapko (MSC-E) drew attention to the links between PM levels and heavy metals and persistent organic pollutants (POPs). Mr B. Calaminus (Germany) drew attention to the work under the Convention to review the Protocol on Heavy Metals; the ongoing review may provide input to the work of the Expert Group.

9. Ms. C. Olivotto (Canada) and Mr. J. Bachmann (United States) described the science and policy approaches to PM in North America. The Expert Group noted the ongoing joint assessment and discussions on PM transport between Canada and the United States. It also noted data and modelling results, as well as current and proposed strategies for the two countries.

10. The Expert Group took note of the presentations and points raised in discussions and agreed to take account of the substantive points summarized above in its future work. It agreed on specific conclusions as listed in section III below.

B. Air quality trends and abatement options

11. Mr. Ballaman summarized the current situation with regard to PM levels and PM content across Europe and noted measured and predicted emission trends from 1990 to 2020. The Expert Group noted the current abatement measures of the Protocols on Heavy Metals and POPs. It also noted that the Gothenburg Protocol addressed secondary particles but primary PM would need to be tackled through new measures. It noted options for addressing PM under the Convention.

12. Mr. D. Johnstone (European Commission) noted issues of relevance from the European Commission's Thematic Strategy and possible revision to the NEC directive. The Expert Group noted that the Strategy would set objectives for the future revision of air quality legislation and that there were possible options for measures in the future.

13. Mr M. Amann (CIAM) presented the state of integrated assessment modelling on PM. The Expert Group noted that the Regional Air Pollution Information and Simulation (RAINS) model used a database developed at CIAM to provide an estimate of country emissions where these were missing. It noted the projection of PM emissions assumed current legislation and application of

all available technical measures. Results were presented for the EU15, the new European Union (EU) accession countries, and non-EU countries. It considered especially the differences identified by sector to have implications for developing abatement strategies. The Expert Group noted the main conclusion that in the EU25 PM emissions were projected to fall by 40% by 2020, but there was little change in the projected emissions from countries in Eastern Europe, the Caucasus and Central Asia (EECCA). Currently available measures could give a further 40% cut in emissions from the EU25. Reductions in PM10 did not necessarily reduce PM2.5 proportionately. Cost-effective approaches to reduce health-relevant PM concentrations involved precursor emissions as well as primary PM emissions. A cost-effective approach showed that largest reduction of primary PM should come from small combustion sources and from industrial processes.

14. Ms K. Rypdal (Norway) reported on the work on PM carried out by the Task Force on Emission Inventories and Projections. She provided information on the reporting of emissions of PM to the Convention. The Expert Group noted the lack of data from some countries and also the probable underestimates of total PM emissions. For PM, unlike other pollutants, no good comparisons between reported emissions and the RAINS database were available. It welcomed the plan of the Task Force on Emission Inventories and Projections to develop further methods for estimating emissions (EB.AIR/GE.1/2004/9) and to revise the Emission Inventory Guidebook. It recognized that data quality was expected to improve in the future. The Expert Group noted that domestic wood burning, while good for managing greenhouse gas emissions, had harmful effects on health: there was a need for more work to develop emission factors for wood stoves.

15. The Expert Group took note of the presentations made and points raised in discussion and agreed to take account of the substantive points summarized above in its future work. It agreed on specific conclusions as listed in section III below.

II. FURTHER WORK

16. The Expert Group discussed and agreed on its future activities including specific work by Expert Group members and the preparation of reports (annex). It further agreed that this should be summarized for the draft workplan for 2006 to be considered by the Working Group on Strategies and Review at its thirty-seventh session (EB.AIR/WG.5/2005/11).

III. CONCLUSIONS AND RECOMMENDATIONS

17. The Expert Group:

(a) Recognized that PM did not appear to have thresholds for effects on human health at the population level and at the range of presently observed concentrations;

- (b) Recognized that current scientific information did not permit differentiation of the components of PM with respect to health effects: there was a need for further investigation on which components of PM are responsible for health effects. The Expert Group recognized that further information was unlikely to be available in the time frame of its work;
- (c) Was concerned that some Parties were not reporting PM emissions and that many Parties' PM emissions inventories appeared incomplete; it urged the Working Group on Strategies and Review to bring this to the attention of the Executive Body;
- (d) Agreed that in the absence of officially submitted national data on emissions, expert estimates would be used; there was a need to develop more complete and consistent emission inventories for Europe; it noted that methods and data for compiling PM emission were incomplete in the EMEP Corinair Emission Inventory Guidebook; it welcomed the work of the Task Force on Emission Inventories and Projections on methodology improvements for compiling and reporting emissions and recommended close collaboration with the Task Force.
- (e) Agreed that was potential to reduce further both primary and secondary PM; abatement measures should address both: while the focus should be to reduce PM_{2.5}, the coarse fraction should not be ignored;
- (f) Recognized that there was potential for further emission reductions in all Parties but that there was less potential for EU countries than for EECCA countries; specific emission reductions strategies might need to be developed for EECCA countries;
- (g) Agreed that even with current legislation, in 2020 there would still be potential for applying readily available low-cost measures to reduce emissions; other measures though technically feasible could only be applied at high cost;
- (h) Agreed that in addition to technical measures the use of non-technical measures should be explored;
- (i) Recognized that control measures for PM did not necessarily have the same efficiency for PM₁₀ and PM_{2.5}; abatement measures might affect them differently depending on sector/source and measures taken;
- (j) Agreed to note that the EMEP Unified model provided information on PM concentrations at the regional scale. Caution was needed when using results for population exposure estimation;

(k) Agreed to consider urban and regional contributions to PM, but proposed to start with transboundary evaluations;

(l) Agreed that uncertainties in modelling needed to be transparent and taken into account in the development of policy;

(m) Recognized that there was a need for further characterization of the relationship between emissions, sources and ambient concentrations. It was therefore important to implement the EMEP monitoring strategy to gather better data on the chemical speciation of PM and provide the necessary information for facilitating source allocation and validating the EMEP model;

(n) Welcomed the results of CIAM and recommended close collaboration with the Task Force on Integrated Assessment Modelling.

(o) Agreed that it should bear in mind relevant work on PM reduction strategies in North America;

(p) Agreed to consider existing policy and regulation, such as existed in the recent protocols to the Convention;

(q) Agreed to take into account the evidence for hemispheric transport and the work of the Task Force on Hemispheric Transport of Air Pollution when developing further measures to reduce PM;

(r) Recognized that there was a need for further consideration of the health and environmental implications of using different options to control PM; it noted that the reduction in exposure was not always proportional to the reductions in emissions;

(s) Agreed to note the new concentrations cap and exposure reduction approach being considered by the European Commission and the extension of the National Emission Ceilings Directive to include health effects of PM;

(t) Agreed to note the links between strategies aimed at reducing PM emissions and those aimed at reducing the other main pollutants.

(u) Agreed to try and avoid overlap and duplication of effort in future work.

18. The Expert Group agreed to hold its second meeting late October or early November 2005 in London.

Annex

WORKPLAN FOR 2005-2006

PARTICULATE MATTER

Objectives: Improved technical understanding of the abatement options and the technical possibilities to reduce concentrations of particulate matter under the Convention.

Main activities and time schedule: The Expert Group on Particulate Matter, with Germany and the United Kingdom as lead countries, will:

- (a) Assess the degree of control of pollutants contributing to the formation of PM already provided for by existing protocols to the Convention and submit a draft report to the Working Group on Strategies and Review at its thirty-eighth session in 2006 (United Kingdom/Co-Chair and Netherlands);
- (b) Review current work under the Convention on PM, taking also into account the latest results of the forthcoming Thematic Strategy on Air Pollution of the European Community and similar strategies of other Parties and submit a draft report to the Working Group on Strategies and Review at its thirty-eighth session in 2006 (United Kingdom/Co-Chair, European Commission, United States and Netherlands);
- (c) Use, inter alia, the results of the EMEP model to prepare supporting information for the third meeting of Expert Group which will review the characteristics of PM as a transboundary pollutant, e.g. contribution to ambient concentrations from national, regional and hemispheric sources, and consider the implications of choosing different particle size fractions (Co-Chairs to liaise with MSC-W);
- (d) Consider, inter alia, the work of CIAM on the scientific and technical requirements, as well as technical and non-technical measures, needed to assist Parties in developing further measures to reduce PM in order to prepare supporting information for the third meeting of the Expert Group (Germany/Co-Chair to liaise with CIAM);
- (e) Give technical input to other abatement strategies of Parties to the Convention;
- (f) Hold its second meeting, following approval of the Bureau of the Executive Body, in late October/early November 2005 in London, to discuss in more depth the scientific issues raised at the first meeting and to identify priorities and tasks for providing further scientific information;
- (g) Hold its third meeting in early spring 2006 in Dessau, Germany, and report the results of its second and third meetings to the thirty-eighth session of the Working Group on Strategies and Review in September 2006;
- (h) Hold its fourth meeting later in 2006, tentatively in London.