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**ECONOMIC COMMISSION FOR EUROPE**

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

Working Group on Strategies and Review

Forty-fourth session  
Geneva, 20–23 April 2009  
Item 3 of the provisional agenda

**OPTIONS FOR REVISING THE GOTHENBURG PROTOCOL**

**TECHNO-ECONOMIC ISSUES**

Report by the Co-Chairs of the Expert Group on Techno-economic Issues

1. This report presents the results of the fourteenth meeting of the Expert Group on Techno-economic Issues, held on 13 and 14 October 2008 in Sorrento, Italy, in accordance with item 1.7 of the 2008 workplan for the implementation of the Convention (ECE/EB.AIR/91/Add.2) adopted by the Executive Body at its twenty-fifth session. It also presents the results of the work of the Expert Group's sub-group on stationary engines, which met on 14 October 2008.
2. The Expert Group addressed the organization of the revision of guidance documents and technical annexes to the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (1999 Gothenburg Protocol). Presentations from the meeting are available at: [www.citepa.org/forums/egtei\\_index.htm](http://www.citepa.org/forums/egtei_index.htm).

3. Experts from the following Parties to the Convention attended the meeting: Austria, Belgium, Czech Republic, Finland, France, Germany, Italy, Netherlands, Norway and United Kingdom of Great Britain and Northern Ireland. Also present were industry experts from CONCAWE (the oil companies' European association for environment, health and safety in refining), EDIPOWER, Electricité de France (EDF), the European Cement Association (CEMBUREAU), and the European Confederation of Iron and Steel Industries (EUROFER). The French Agency of Environment and Energy Management (ADEME), the French-German Institute for Environmental Research (IFARE), the Interprofessional Technical Centre for Studies on Atmospheric Pollution (CITEPA), and the International Institute for Applied Systems Analysis (IIASA) were also represented. Representatives of the Centre for Energy and Processes of the research association ARMINES (ARMINES-CEP) and of University College London also attended.
4. Mr. J.-G. Bartaire (France) and Mr. T. Pignatelli (Italy) co-chaired the meeting, which was hosted by Italy.

## I. INTRODUCTORY REMARKS AND OBJECTIVES

5. The Co-Chairs introduced the main objective of the meeting: to organize the work for revising the existing guidance documents and the technical annexes to the Gothenburg Protocol, covering sulphur, nitrogen oxides (NO<sub>x</sub>), non-methane volatile organic compounds (NMVOCs) and particulate matter (PM). They recalled that the work had to be finalized in time for the forty-fifth session of the Working Group on Strategies and Review in September 2009. However, provisional technical annexes needed to be presented to the Working Group's forty-fourth session in April 2009. In view of the tight schedule, the Co-Chairs invited active contributions from members of the Expert Group. On behalf of the secretariat, Mr. Pignatelli delivered a presentation highlighting the main outcomes of the Working Group's forty-second session, the tasks assigned to the Expert Group and the time schedule for their delivery.

6. Ms. C. Ory (EDF) presented the latest developments in the revision of the European Union (EU) National Emission Ceilings (NEC)<sup>1</sup> Directive and the Integrated Pollution Prevention Control (IPPC)<sup>2</sup> Directive. She informed the Expert Group that some measures scheduled in the EU Thematic Strategy on Air Pollution were already adopted, such as the new Air Quality Directive<sup>3</sup> and Euro 5 and Euro 6 emissions standards for cars and vans. The VOC<sup>4</sup>

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<sup>1</sup> 2001/81/EC.

<sup>2</sup> 1996/61/EC, codified as 2008/1/EC.

<sup>3</sup> 2008/50/EC.

Solvents Emissions Directive<sup>5</sup>, on the solvent content of paints, could be reviewed. A stage II directive for limiting VOCs from the refuelling of cars was in preparation as a proposal for setting emission limit values (ELVs) for domestic boilers and heaters. The revision of the NEC Directive was expected to propose new emission caps for five priority pollutants to be attained by 2020. These emission caps would be consistent with the objectives of the Thematic Strategy. She stressed that final agreement on the NEC Directive was linked to the EU climate action and renewable energy package, which was still pending.

## II. PROGRESS OF THE EXPERT GROUP

7. Ms. N. Thybaud (ADEME) presented the work carried out by the sub-group on large combustion plants for reduction of emissions until 2030. She recalled that a summary of the sub-group's report had been provided to the Working Group's forty-first session and that a full report was available. The sub-group delivered updated information on the integrated gasification combined cycle, oxycombustion, the flowpac desulphurization technique, carbon capture and storage techniques, and a number of improvements of existing technologies such as coal-fired power plants and the combined cycle gas turbine. It was suggested that in the future, the sub-group could collect information for smaller plants.

8. Ms. A. Karjalainen (Finland) presented progress made by the sub-group on stationary engines. After three meetings, the sub-group had developed a provisional report containing a review of ELVs implemented in Europe. The sub-group had held its last meeting on 14 October 2008, back-to-back to the Expert Group meeting (see chapter III).

9. Ms. R. El Hitti (ARMINES-CEP) presented the carbon dioxide (CO<sub>2</sub>) capture technique developed by ARMINES-CEP based upon the anti-sublimation process. The technique could be used on power plants as well as on larger emitters of CO<sub>2</sub> such as cement, iron and steel plants.

10. Ms K. Krauss (Germany) presented the results of a workshop held in Armenia focusing on the abilities of countries of Eastern Europe, Caucasus and Central Asia (EECCA) to progress towards emissions monitoring and reductions. She stressed that the question of flexibility remained an important issue and had been discussed. A number of options for supporting EECCA countries had been identified. Possible solutions included introducing flexibility in terms of less stringent emission ceilings, non-binding provisions for some existing plants and/or exceptions for existing plants. Inputs from the Task Force on Heavy Metals would be provided

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<sup>4</sup> Volatile organic compounds.

<sup>5</sup> 1999/13/EC.

with regard to the work on PM. Ms. Kraus drew attention to a joint meeting between the Expert Group and the Task Force on Heavy Metals in the EECCA subregion envisaged for 2009.

11. Mr. Z. Klimont (IIASA) presented the latest results of the GAINS model and sensitivity case analysis. He stressed that the distribution of burden would vary between countries and that robust information would be required on the technologies used in modelling. Many sources of PM emissions not covered by the Protocol could be considered, including industrial processes, small-scale industrial and residential combustion. Non-exhaust emissions from traffic sources, an important contributor to exceedance of PM concentration limits, could also be considered. Special attention should be given to the cross-media effects.

12. Ms. N. Allemand (CITEPA) presented the organization of the new guidance document and the technical annexes. One guidance document would be developed covering sulphur, NO<sub>x</sub>, NMVOCs and PM<sub>2.5</sub> and PM<sub>10</sub> best available techniques (BAT). The new document would contain six chapters related to common general issues for the four groups of pollutants and 45 sectoral chapters presenting BAT. The sectoral chapters would cover the four pollutants and provide, if necessary, background information for developing ELVs, which would be included in the technical annexes. All types of references would be used, although the European Community BREF<sup>6</sup> documents were expected to be the most frequent. The sectoral chapters were those already considered for sulphur, NO<sub>x</sub> and NMVOCs in the existing guidance documents, but would also include new activities for total suspended particles (TSP) and PM covered by the Protocol on Heavy Metals<sup>7</sup>. A sectoral chapter had been separately developed for small combustion plants and for the solvent content of products.

13. For the technical annexes, the original structure of the existing documents would be maintained. Each technical annex would address one single pollutant. It was recalled that the Expert Group had been mandated to revise annexes IV, V, VI and VIII and to develop new annexes on PM emissions and the NMVOCs content of products (annexes X and XI, respectively).

14. A set of questions previously sent to the group was examined and discussed during the meeting. Due to time pressures, the questions had been examined only by few people before the meeting. Complete written answers were requested by 20 November 2008. The discussion highlighted a number of policy issues as well as technical questions. It was agreed that policy-related questions would be forwarded to the Working Group on Strategies and Review.

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<sup>6</sup> BAT reference.

<sup>7</sup> 1998 Aarhus Protocol on Heavy Metals.

15. Participants noted that references used for preparing guidance documents should be as widely based as possible and not focus on BREF documents only. Flexibility should be taken into account, although this issue was considered to lie within the competence of the Working Group on Strategies and Review and outside the mandate of the Expert Group, which could only submit proposals or amendments. The Expert Group envisaged the participation of representatives of the United States and Canada as a necessary requirement for addressing part B of the technical annexes. It was pointed out that for EU Member States, the Gothenburg Protocol should not have additional provisions when compared to EU legislation. One flexibility option envisaged by the Expert Group relied on a differentiated structure of technical annexes according to the three different groups of Parties: (a) United States and Canada; (b) EU Parties; and (c) other Parties.

16. The list of additional activities selected to be considered as PM emission sources, both in the guidance documents and the technical annexes, should cover all the main PM sources that could be controlled. A cross check was deemed necessary. It was noted that some PM emissions were related to agriculture and farming. As these activities were not covered by the Expert Group, a cross-check with other technical bodies under the Convention was needed to ensure a complete coverage.

17. The review of a number of definitions was also discussed. It was agreed that TSP was the most appropriate technical term when stack emissions were considered, while dust should be used when fugitive emissions were considered. The definition of PM<sub>2.5</sub> and PM<sub>10</sub> should take into account CEN<sup>8</sup> standards. The definition of VOCs should be in line with the definition adopted in the EU directives.

18. The definition of new plants and existing plants should be further and carefully discussed and defined to avoid any risk of introducing inappropriate ELVs for either new or old plants. It was noted that the definition should be as simple as possible.

19. The definition of ELVs should be examined on a case-by-case basis. Hourly average values were not deemed suitable in the scope of the Gothenburg Protocol, although they were appropriate for monitoring and environment protection purpose in the vicinity of a plant. A long-term average value could be more appropriate for the purposes of the Protocol. Different opinions were expressed about ELVs based on the upper range of BAT performance level. Some experts considered that the ambition level should be high, while for others the choice

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<sup>8</sup> European Committee for Standardization.

depended on the time allowed for compliance. There was agreement, however, that the way the BAT performance levels were derived had to be taken into account.

20. Participants noted that a set of activities related to gas distribution and petroleum extraction was still open for inclusion, with detailed description, in the guidance documents.

21. The definition of small combustion plants should be further improved. Participants agreed that such plants could be considered in technical annexes. ELVs were probably quite difficult to implement, although ad hoc studies on approval tests should be envisaged.

22. Participants pointed out that cost data should be updated as much as possible, given the increased costs of raw materials and catalysts and that since 2000 cost data were outdated. Cost figures should also be explained.

### **III. EMISSION LIMIT VALUES FOR NO<sub>x</sub> FROM STATIONARY ENGINES**

23. The third technical meeting of the stationary engines expert sub-group was held in on 14 October 2008 in Sorrento. Experts from Belgium, Finland, France, Germany, Greece, Italy, Netherlands and the United Kingdom attended. Representatives of the European Association of Internal Combustion Engine Manufacturers (EUROMOT) and the German engine manufacturer MTU were also present. The experts discussed options for reviewing the ELVs for stationary engines. While views differed on the levels of ELVs to be proposed for new stationary engines, based on the discussions the sub-group decided to continue working on two options. The first option would be based on technological possibilities to reduce emissions, and the second would take into account economic aspects. A third option could then describe the flexibility of applying either option 1 or option 2.

24. The sub-group would work within the same time frame as agreed by the Expert Group. It would deliver the background document with new chapters 5–10 and the draft guidance document including the proposals for reviewing the NO<sub>x</sub> ELVs for stationary engines of table IV of annex V, for comment by the 30 November 2008 and would expect feedback by 31 January 2009.

### **IV. CONCLUSIONS**

25. The Expert Group agreed to stick to the proposed work calendar, while allowing some flexibility in the deadline for comments. Participants decided that full references of focal points in CITEPA and IFARE, along with the list of activities covered, should be sent to the Expert Group members.

26. Comments on the draft guidance documents and technical annexes should be sent to focal points with a copy to the Expert Group members by 30 November 2008 at the latest, using the prepared Excel file “comments on draft chapters.xls”. Answers to the questions raised on 13 and 14 October should be sent to the focal point by 20 November 2008 at the latest.

27. Participants identified the need for a more clear distinction between technical and policy issues. They agreed that a paper on this subject would be drafted, circulated within the Expert Group and presented to the Working Group on Strategies and Review.

28. The Expert Group recognized that some future difficulties may arise in view of the adoption of important EU regulations currently under discussion. It decided to discuss the issue with the Working Group.

29. The Expert Group highlighted the need for the broad attendance of Expert Group members at the forty-fourth session of the Working Group on Strategies and Review in April 2009 and encouraged their participation.

30. The Expert Group:

(a) Welcomed the offer of Finland to work on a draft of guidance document on stationary engines;

(b) Welcomed the offer of the Netherlands to work on a draft guidance document and a draft technical annex on the solvent content of products;

(c) Welcomed collaboration with the Task Force on Heavy Metals and agreed to hold a joint meeting, tentatively planned to be hosted by one of the EECCA countries in 2009.

31. The Expert Group agreed to hold its fifteenth meeting in the first half of 2009 in Italy and its sixteenth meeting in the second half of the year in France. The exact dates and venues would be decided and communicated at a later date. It was also agreed that a list of tentative dates for technical meetings with Expert Group members and ad hoc meetings, focusing on certain activity sectors, would be proposed in 2009.

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