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

Working Group on Effects

Twenty-fifth session
Geneva, 30 August – 1 September 2006

**REPORT ON THE TWENTY-FIFTH SESSION
OF THE WORKING GROUP ON EFFECTS**

Introduction

1. The twenty-fifth session of the Working Group on Effects took place in Geneva from 30 August to 1 September 2006.
2. It was attended by representatives of the following Parties to the Convention: Armenia; Austria; Azerbaijan; Belarus; Bulgaria; the Czech Republic; Denmark; Finland; France; Georgia; Germany; Hungary; Italy; the Netherlands; Norway; Poland; the Republic of Moldova; the Russian Federation; Slovenia; Spain; Sweden; Switzerland; Ukraine; the United Kingdom; and the European Community (EC).
3. A representative of the World Health Organization's European Centre for Environment and Health (WHO/ECEH), Bonn Office, was present.
4. Mr. H.-D. Gregor (Germany) chaired the meeting.

I. ADOPTION OF THE AGENDA

5. The agenda (ECE/EB.AIR/WG.1/2006/1) was adopted.

II. ADOPTION OF THE REPORT OF THE TWENTY-FOURTH SESSION

6. The Working Group adopted the report of its twenty-fourth session (EB.AIR/WG.1/2005/2).

III. MATTERS ARISING FROM RECENT MEETINGS OF THE EXECUTIVE BODY AND ITS SUBSIDIARY BODIES

7. Mr. K. Bull, Chief of the Pollution Prevention Team of the Environment, Housing and Land Management Division, provided information on the present status of the Convention's protocols. He drew special attention to the strategy on countries in Eastern Europe, Caucasus and Central Asia (EECCA) and the related action plan.

8. Mr. R. Ballaman (Switzerland), Chair of the Working Group on Strategies and Review, drew particular attention to the financing of core activities not covered by the EMEP Protocol. The Executive Body had noted the mechanism was not effective and had requested the Working Group on Strategies and Review to consider the issue. Mr. Ballaman suggested the Working Group on Effects might identify specific projects or tasks to be funded by Parties.

9. The Working Group took note of the decisions made by the Executive Body and its Bureau, and the deliberations of other bodies under the Convention, and agreed to bear them in mind when discussing its future activities.

IV. RECENT ACHIEVEMENTS OF THE EFFECTS-ORIENTED ACTIVITIES

A. Recent activities of International Cooperative Programmes, the Task Force on Health and the Joint Expert Group on Dynamic Modelling

10. The Chair introduced the 2006 Joint Report of the International Cooperative Programmes (ICPs) and the Task Force on Health on progress in the effects-oriented activities (ECE/EB.AIR/WG.1/2006/3), and noted the annexes (ECE/EB.AIR/WG.1/2006/3/Add.1) describing the recent activities of the programmes and listing their relevant publications. The Chair noted that substantive inputs for the review of the Gothenburg Protocol would be presented in detail under item 5 cross-cutting issues. The Working Group took note of the appointment of Mr. J. Tidblad as Co-Chair of ICP Materials and noted with appreciation the work done by the previous Co-Chair, Mr. V. Kucera. The representative from the lead country of each programme reviewed the recent achievements and publications:

- (a) Mr. M. Lorenz (Germany), on behalf of Mr. M. Köhl, Chair of the Task Force of the ICP on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests);
- (b) Ms. B. Kvaeven (Norway), Chair of the Task Force of the ICP on Assessment and Monitoring of Acidification of Rivers and Lakes (ICP Waters);
- (c) Mr. J. Tidblad (Sweden), Co-Chair of the Task Force of the ICP on Effects of Air Pollution on Materials, including Historic and Cultural Monuments (ICP Materials) and Head of the Main Research Centre of the programme, and Mr. S. Doytchinov (Italy), Co-Chair of ICP Materials;
- (d) Mr. H. Harmens (United Kingdom), Chair of the Task Force of the ICP on Effects of Air Pollution on Natural Vegetation and Crops (ICP Vegetation);
- (e) Mr. L. Lundin (Sweden), Chair of the Task Force of the ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems (ICP Integrated Monitoring);
- (f) Mr. T. Spranger (Germany), Chair of the Task Force of the ICP on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends (ICP Modelling and Mapping);
- (g) Mr. M. Krzyzanowski, representative of WHO/ECEH, and Chair of the Task Force on the Health Aspects of Air Pollution (Task Force on Health);
- (h) Mr. A. Jenkins (United Kingdom), Co-Chair of the Joint Expert Group on Dynamic Modelling.

11. The Working Group on Effects:

- (a) Took note of the recent activities of ICPs, Task Forces and the Joint Expert Group (ECE/EB.AIR/WG.1/2006/3/Add.1, annexes I–VII);
- (b) Welcomed the efforts of ICP Forests to evaluate the effects of acidity and nitrogen on ground vegetation, and took note of the 2006 executive report, “The condition of forests in Europe”;
- (c) Noted the work of ICP Waters on long-term trends of nitrogen in surface waters and the “Report 83/2006; Critical loads, target load functions and dynamic modelling for surface waters and ICP Waters sites”;
- (d) Welcomed the results on trends of corrosion and air pollutants in 1987–2003 (ECE/EB.AIR/WG.1/2006/7) and took note of the “Report 51; Technical manual for the trend exposure programme 2005–2006” and of the report on the Workshop on Economic Impacts of Air Pollution on Cultural Heritage (ECE/EB.AIR/WG.1/2006/17);
- (e) Noted the establishment of five regional centres to collate field-based evidence for effects of ozone (O_3) on vegetation, and took note of the ICP Vegetation annual report 2005/2006 “Air Pollution and Vegetation”;
- (f) Noted the increased cooperation and fruitful collaboration of ICP Integrated Monitoring with other programmes, in particular on dynamic modelling, and took note of its annual 2006 report;
- (g) Took note of the name of the Coordination Centre for Effects (CCE) now spelled “centre” instead of “center”;

(h) Welcomed the work of ICP Modelling and Mapping on updating and evaluating critical loads for acidification and eutrophication and target load functions for acidification as well as developments in nitrogen assessment; the updating and evaluating of critical loads for heavy metals (lead (Pb), cadmium (Cd) and mercury (Hg)) which were readily available for the review of the 1998 Heavy Metals Protocol. It took note of the 2005 status report, “European critical loads and dynamic modelling” of CCE;

(i) Stressed the importance of active participation of all Parties to the Convention in the modelling and mapping activities and urged Parties to be prepared to respond to calls for data;

(j) Noted the work of the Task Force on Health on reassessing the health impacts of heavy metals, and took note of its report “Health risks of particulate matter from long-range transboundary air pollution”;

(k) Expressed appreciation to the WHO/ECEH, Bonn Office, for its work and continuing leading role in the activities of the Task Force on Health and in having increased participation from Parties in EECCA;

(l) Reiterated its invitation to Parties to nominate their experts and actively participate in the work of the Task Force on Health;

(m) Appreciated the progress made by the Joint Expert Group on Dynamic Modelling in assessing the applicability of dynamic models and target loads in the review of the Gothenburg Protocol. It took note of the conclusions and recommendations from the sixth meeting of the Group (ECE/EB.AIR/WG.1/2006/14), in particular the major breakthrough in dynamic modelling as a result of the CCE call for data in 2004, and decided to forward them to the Executive Body for information;

(n) Took note of the results of the workshop “Nitrogen Processes and Dynamic Modelling” (ECE/EB.AIR/WG.1/2006/14, annex), held in connection with the Joint Expert Group meeting;

(o) Noted the active participation of ICPs and national experts in the activities of the Joint Expert Group, and the proposals from the Group to continue its activities following the Convention’s workplan.

B. Common aspects of International Cooperative Programmes and the Task Force on Health

12. The Chair drew attention to the growing participation of countries in the effects-oriented activities and noted the positive results of closer and more effective cooperation among ICPs, as well as with EMEP and other bodies under the Convention. He also noted the effective publicity achieved following the twenty-fifth anniversary of the Convention in December 2004 and encouraged further publicizing the work of the programmes.

13. The Working Group on Effects:

- (a) Welcomed the efforts of ICPs and the Task Force on Health in addressing priority tasks that support effective implementation of the Convention, particularly the input to reviews of the three most recent protocols;
- (b) Stressed once more the importance of the work carried out by national focal centres and the support provided by the lead countries, coordinating centres and their host countries and organizations;
- (c) Welcomed the increased level of participation in the session and noted the increasing trend of Parties participating in the activities of the programmes;
- (d) Stressed the importance of the active participation of all Parties to the Convention in the effects-oriented activities for providing the knowledge and high-quality data for effective implementation and review of the Convention and its protocols;
- (e) Invited the Executive Body to reiterate its invitation to Parties to nominate national focal centres for those effects-oriented activities/programmes in which they were not actively participating.

C. **Activities in selected countries**

14. The Chair noted the Convention's current emphasis on encouraging participation of EECCA Parties with the aim of assisting them to implement the Convention and its more recent protocols.

15. Representatives of Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, the Republic of Moldova, the Russian Federation and Ukraine gave short presentations of air pollution effects-related activities in their countries. Many countries participated in one or more programmes, but some had no ongoing effects-oriented activities. The Working Group noted the *Manual on methodologies and criteria for modelling and mapping critical loads and levels and air pollution effects, risks and trends* was now available in Russian at the ICP Modelling and Mapping website.

16. The Working Group welcomed the information received. It urged the representatives to contact the programme centres for details on participating in meetings and activities and to receive information on existing and potential contacts on effects-oriented activities. The presenters agreed to provide information on their activities in English and Russian for dissemination on the Convention website and for delegates attending a seminar organized by the UNECE project "Capacity building for air quality management and the application of clean coal combustion technologies in Central Asia" (CAPACT) (www.unece.org/ie/capact).

V. REVIEW OF RECENT RESULTS AND UPDATING OF SCIENTIFIC AND TECHNICAL KNOWLEDGE

17. The Chair drew attention to the pollutant-specific topics for the presentations on recent results from the activities of the ICPs. The 2006 joint report had been compiled to support the programme presentations under seven topics. The presentations drew largely from the 2006 joint report and the technical reports of the ICPs.

A. Acidification

18. Mr. Lorenz, Head of the Programme Coordinating Centre of ICP Forests, summarized sulphur throughfall deposition trends, response of ground vegetation to acidity and presented the first results of dynamic modelling carried out at selected level II sites (ECE/EB.AIR/WG.1/2006/5).

19. Ms. B.-L. Skjelkvåle (Norway), ICP Waters, reported on the calculation of critical and target loads at monitoring sites and drew special attention to the temporal effects of sulphur adsorption and nitrogen retention on acidification. She explained that nitrogen retention and losses in catchments continued to be major unknown factors despite extensive scientific research. In addition, the future climate change effects on catchments and freshwaters will add complexity in the evaluation of acid deposition scenarios.

20. Mr. Tidblad presented Europe-wide maps for 1980–2005 using a new model for calculating copper (Cu) runoff from surfaces on buildings and constructions. He noted the observed corrosion in 1987–1997 was generally decreasing at the experimental sites, which in 1997–2003 continued for carbon steel but not for zinc (Zn) and limestone.

21. Mr. M. Forsius (Finland), Head of the Programme Centre of ICP Integrated Monitoring, reported that sulphate concentrations in deposition and runoff and soil water were generally decreasing as a response to decreasing deposition in the period 1993–2003. Nitrogen concentrations did not correlate with soil and runoff water, probably due to catchment-specific nitrogen retention processes.

22. Mr. J.-P. Hettelingh (Netherlands), Head of the Coordination Centre for Effects (CCE) of ICP Modelling and Mapping, showed the new 2006 data from national focal centres on critical loads for acidification and eutrophication and on dynamic models (ECE/EB.AIR/WG.1/2006/10), stressing these were the last updates to the data set for use in Gothenburg Protocol review. In the ensuing discussion delegates concluded the use of dynamic modelling and target loads was possible in the review of the Gothenburg Protocol. However, as target loads were lower than critical loads, they would be more difficult to achieve.

23. The Working Group recognized with appreciation the range and quality of the work being done on acidification and:

- (a) Took note of the ICP Forests report on trends of sulphur throughfall deposition trends, response of ground vegetation to acidity and on dynamic modelling at monitoring sites and (ECE/EB.AIR/WG.1/2006/5);
- (b) Took note of the ICP Waters report on the critical and target loads of surface waters (ECE/EB.AIR/WG.1/2006/6);
- (c) Took note of the ICP Materials report on the trends of corrosion and air pollutants in 1987–2003 (ECE/EB.AIR/WG.1/2006/7);
- (d) Took note of the ICP Integrated Monitoring report on trends in deposition and soil and water;
- (e) Approved the results of ICP Modelling and Mapping based on the 2005 call for data on European critical loads of acidification and eutrophication, including dynamic modelling parameters for use in integrated assessment modelling (ECE/EB.AIR/WG.1/2006/10) and recommended that these be used in work under the Convention, in particular in the review of the Gothenburg Protocol;
- (f) Urged ICPs with field and modelled data to collaborate with ICP Modelling and Mapping on the links between observations and the reported critical loads and levels.

B. Nutrient nitrogen

24. Mr. Lorenz described the nitrate deposition and the occurrence of nitrogen-indicating species of ground vegetation (ECE/EB.AIR/WG.1/2006/5).

25. Mr. Harmens summarized long-term temporal trends in the nitrogen concentration in European mosses found by ICP Vegetation, drawing attention to that absence of observed changes in concentration before 1960, with a clear increase observed after 1960 only for Switzerland.

26. Mr. Forsius reported that only a few statistically significant trends were observed for nitrogen concentrations in deposition, soil and water at ICP Integrated Monitoring sites, and no clear regional pattern could be identified. He also noted the importance of nitrogen processes for dynamic modelling of effects and critical and target loads.

27. Mr. M. Posch (Netherlands), CCE, described the new 2006 critical loads data on eutrophication (ECE/EB.AIR/WG.1/2006/10). He described the planned voluntary call for data that would update critical loads for eutrophication and parameters for dynamic modelling.

28. Mr. Spranger (Germany) reported, on behalf of the organizers of the workshop, on the results of the Workshop on Causal Relations of Nitrogen in the Cascade (ECE/EB.AIR/WG.1/2006/15), noting that agriculture was in general the most important source

of nitrogen emissions, that nitrogen was important in many environmental problems and policies, that nitrogen could cause sequential effects in the cascade, and that cooperation with institutions outside the Convention was necessary.

29. In the ensuing discussion the importance of dynamic modelling, in addition to the calculation of critical and target loads, was acknowledged. Delegates recommended discussing, when possible, nitrogen as an acidifying agent under the previous topic and whilst focussing on the eutrophying effects of nutrient nitrogen under this agenda item.

30. The Working Group congratulated the programmes on their important work on nutrient nitrogen and:

- (a) Noted the increased attention on nutrient nitrogen issues and urged that more work be done on this issue in future;
- (b) Took note of the results of ICP Forests on the impacts of nitrogen on vegetation (ECE/EB.AIR/WG.1/2006/5);
- (c) Took note of the ICP Vegetation results on long-term temporal trends in nitrogen concentrations in European mosses;
- (d) Took note of the ICP Integrated Monitoring findings on trends of nitrogen deposition and soil and water parameters;
- (e) Approved the results of ICP Modelling and Mapping on the 2005 call for data on European critical loads of eutrophication (ECE/EB.AIR/WG.1/2006/10) and recommended that those results be used in work under the Convention, in particular in the review of the Gothenburg Protocol;
- (f) Approved the proposal of the nitrogen session of the sixteenth CCE workshop to make a voluntary call for data for the nitrogen-related parameters (ECE/EB.AIR/WG.1/2006/10), as preparation for a possible revision of the Gothenburg Protocol; took note of the results of this workshop, especially the nitrogen session, and recommended the use of the document “Development in deriving critical limits and modelling critical nitrogen loads for terrestrial ecosystems in Europe” as information for national focal centres for the call for data;
- (g) Took note of the report on the Workshop on Causal Relations of Nitrogen in the Cascade (ECE/EB.AIR/WG.1/2006/15).

C. Ozone

31. Mr. Harmens summarized recent results on the maps of O₃ critical level exceedance, carried out in collaboration with the EMEP Meteorological Synthesizing Centre – West (MSC-W), where the spatial variation was found to be large for the concentration-based approach compared to the flux-based approach, in particular for forest trees. He highlighted the main conclusions from the Workshop on Critical Levels of Ozone: Further Applying and Developing the Flux-based Concept (ECE/EB.AIR/WG.1/2006/11), in particular the recommendation to use a flux-based approach for crops and trees in integrated assessment modelling.

32. Mr. Krzyzanowski outlined information on the health risks of O₃ based on several health endpoints, noting that estimated absolute numbers of premature deaths attributable to O₃ varied largely depending on the country. He also noted the global updates to the WHO *Air Quality Guidelines* on O₃.

33. The Working Group on Effects welcomed the progress made and the new results obtained regarding O₃ effects and:

(a) Took note of the ICP Vegetation maps of exceedances of critical levels of O₃ and the technical report on the impacts of O₃ on vegetation in a changing climate (ECE/EB.AIR/WG.1/2006/8);

(b) Endorsed the results of the Workshop on Critical Levels of Ozone: Further Applying and Developing the Flux-based Concept (ECE/EB.AIR/WG.1/2006/11) and the work to develop further the flux-based parameterization for the receptor species;

(c) Took note of the results of the Task Force on Health regarding the impacts of O₃ on human health and the tentative assessment of O₃ risk in EECCA, keeping in mind the need to address ways to communicate the risks to policymakers.

D. Particulate matter

34. Mr. Krzyzanowski described the recent report on the health risks of particulate matter (PM) and noted the global updates to the WHO *Air Quality Guidelines* on PM.

35. The Working Group on Effects noted with appreciation the work on PM and took note of the assessment of the population exposure of PM in the Russian Federation. It also took note of the report "Health risks of particulate matter from long-range transboundary air pollution".

E. Heavy metals

36. Mr. Harmens reported on trends in heavy metals (Cd, Pb and Hg) in mosses and deposition, carried out in collaboration with the EMEP Meteorological Synthesizing Centre – East (MSC-E).

37. Mr. Lundin introduced the results from catchment budgets at ICP Integrated Monitoring sites showing that deposition was often higher than leaching, indicating accumulation in the catchment. Critical loads were exceeded for Pb and Hg, but not for Cd (ECE/EB.AIR/WG.1/2006/9).

38. Mr. Hettelingh introduced the new 2006 data on critical loads of heavy metals (Pb, Cd and Hg) resulting from the CCE call for data in 2005 (ECE/EB.AIR/WG.1/2006/10). Both health and ecosystem criteria and modelled deposition were used in the assessment. Pb and Hg showed

large areas at risk whilst Cd showed small areas at risk in Europe. He also summarized a study on other heavy metals (chromium, nickel, Cu, Zn, arsenic and selenium) commissioned by the Netherlands.

39. Ms. G. Schuetze (Germany) described the material compiled for the Task Force on Heavy Metals from the results of several ICPs. The report included methodologies and results of the effects-based assessment on the impacts of heavy metals on the environment and health. She noted in particular that future work on risk assessment also considered the temporal aspects of accumulation of heavy metals.

40. Mr. Krzyzanowski informed on the update of the risk assessment of heavy metals, described in the draft report “Review of health risks of heavy metals from long-range transboundary air pollution”.

41. The Working Group on Effects expressed its appreciation of the work on heavy metals and:

(a) Took note of the ICP Vegetation report on trends in heavy metal concentration in mosses and in deposition;

(b) Took note of the ICP Integrated Monitoring report on the catchment budgets and critical loads of heavy metals at ICP Integrated Monitoring sites (ECE/EB.AIR/WG.1/2006/9);

(c) Approved the updates of the critical loads for heavy metals (ECE/EB.AIR/WG.1/2006/10) and recommended that the results be used in work under the Convention;

(d) Confirmed again the underlying methodology was scientifically sound and formed a satisfactory basis for the application of an effects-based approach as described in ECE/EB.AIR/WG.5/2006/2, paragraph 75. It noted that uncertainties in critical loads exceedance calculations were mainly found in emission data. It recommended that the results be used in work under the Convention, in particular in the review of the Protocol on Heavy Metals, and entrusted its Chair to include these conclusions in his report to the thirty-eighth session of the Working Group on Strategies and Review;

(e) Welcomed work by the Netherlands to assess heavy metals (chromium, nickel, Cu, Zn, arsenic and selenium);

(f) Welcomed the draft report “Review of health risks of heavy metals from long-range transboundary air pollution” of the Task Force on Health and encouraged all Parties to actively participate in the finalization of this work;

(g) Took note of the conclusions on the health risks of heavy metals from long-range transboundary air pollution as summarized in the document ECE/EB.AIR/WG.1/2006/12.

F. Persistent organic pollutants

42. The Task Force on Health received no requests from the Working Group on Strategies and Review for revising the health risk assessment of persistent organic pollutants (POP). Therefore, no further work on health hazard evaluation was initiated.

43. The Working Group on Effects noted the overall importance of further work on POPs and that the Working Group on Strategies and Review had not yet requested a health risk assessment of POPs by the Task Force on Health. It also took note of the Task Force's recognition that, according to the Protocol on POPs, actual observed health effects were not prerequisites for inclusion of a pollutant in the Protocol. The likelihood of such effects due to the potential of build-up in the environment and bioaccumulation of the levels was deemed to be sufficient reason for inclusion.

G. Cross-cutting items

44. Mr. Lorenz reported that three international cross-comparison courses for defoliation assessment were carried out under ICP Forests. He informed on the progress in developing the database that will comprise level I and level II data and which would be accessible through an Internet interface that would allow easy submission and retrieval of data.

45. Ms. Skjelkvale introduced preparations for the Workshop on Confounding Factors in Recovery from Acid Deposition in Surface Waters, which aimed to quantify the synergistic effects of environmental factors other than acid deposition on acidification and recovery of surface waters. She also presented the update of long-term trends in acidification, nitrogen, total organic carbon and biota of ICP Waters, noting that no obvious changes had been observed in nitrate in surface waters in 1990–2004.

46. Mr. S. Doytchinov (Italy), Co-Chair of ICP Materials, described the corrosion maps in high spatial resolution in the Czech Republic and Germany for selected pollutants for carbon steel, Zn, bronze, Cu and limestone, highlighting the work done in preparing input data for calculations.

47. Mr. Harmens reported that increased and reduced exceedances of concentration- and flux-based impacts of O₃ on vegetation, respectively, could be expected in a changing climate (ECE/EB.AIR/WG.1/2006/8) and that O₃ and nitrogen can have both synergistic and antagonistic effects on species and ecosystem processes and may interact in unpredictable ways to affect plant communities.

48. The recent information on effects-based approaches for the Protocol reviews included:

(a) ICP Forests. ICP Forests would report on trends of sulphate, ammonium, nitrate and of other elements (e.g. heavy metals, base cations) and contribute to the verification of deposition models (in collaboration with EMEP), the assessment of critical loads and dynamic modelling and the verification of the effectiveness of the Convention's policies, as well as the assessment of effects of depositions on forest soil and crown condition, tree nutrition and growth and floristic biodiversity;

(b) ICP Waters. The trends in surface waters were reported in 2006, including information on stock at risk and comparison of modelled and calculated critical loads with monitoring data. The report was prepared jointly with ICP Integrated Monitoring and would be published in spring 2007;

(c) ICP Materials. The new information on the effects of air pollution on materials would include corrosion of zinc, carbon steel and limestone. A target level for sulphur dioxide (SO_2) was achieved using a tolerable corrosion on each material, taking into account the side effects of nitric acid (HNO_3) and PM. A target level for PM10 was derived by assigning a tolerable effect, 35% loss in reflectance, on the soiling of painted steel, white plastic and limestone by PM;

(d) ICP Vegetation. The *Mapping manual* provided methods of concentration-based O_3 critical levels for crops, forest trees and (semi-)natural vegetation, with an update for (semi-)natural vegetation dominated by perennials. It also provided methods of flux-based critical levels for crops and provisionally for trees, and a flux-based method for crops and forest trees for use in integrated assessment models.

(e) ICP Integrated Monitoring. The reporting would include information on trends in deposition, runoff and soil water, proton budgets and significance of sulphur and nitrogen processes, climate change processes affecting acidification recovery, nitrogen budgets and risk indicators, heavy metal budgets and estimates on accumulation and critical loads. Other additional results from three common workplan items were reported jointly with ICP Waters;

(f) ICP Modelling and Mapping. Linearized relationships between average accumulated exceedance and emissions were derived in collaboration with the Centre for Integrated Assessment Modelling to facilitate optimization. The document "Development in deriving critical limits and modelling critical nitrogen loads for terrestrial ecosystems in Europe" reviewed critical limits of nitrogen and terrestrial dynamic modelling methodologies, which included vegetation changes and biodiversity;

(g) Task Force on Health. The Task Force forwarded the new WHO *Air Quality Guidelines* for the attention of the Working Group.

49. The current information on dose-response functions and stock at risk included:

(a) ICP Forests. The report on cause-effect relationships, available in the end of 2006, would emphasize the effects of sulphur and nitrogen on forest soil chemistry, ground vegetation, crown condition and tree growth, and the O_3 impacts on leaves of ground vegetation and trees;

(b) ICP Waters. The report on dose-response functions would discuss the effects of deposition and precipitation chemistry on water chemistry and the effects of water chemistry on

biology. Data from literature were available on fish stocks in Fennoscandia, but the stocks at risk had otherwise not been quantified;

(c) ICP Materials. Dose-response functions for corrosion were available for carbon steel, Zn, Cu, bronze, limestone and glass, due to SO₂, HNO₃ and PM. The responses for soiling due to PM were available for painted steel, white plastic and limestone. Stock at risk had been assessed in selected countries;

(d) ICP Vegetation. The dose-response functions for O₃ were primarily based on experiments in open-top chambers describing impacts on above-ground growth and yield. Data existed to indicate relative sensitivity of plant species to O₃. Stock at risk estimates were available for crops;

(e) ICP Integrated Monitoring. The dose-response functions were derived with empirical equations based on budgets and soil chemistry indicators for nitrogen;

(f) ICP Modelling and Mapping. The critical load of terrestrial acidification employed as a critical threshold the ratio of base cations to aluminium, which was also an important indicator in dynamic modelling. In addition, empirical critical loads were available for terrestrial ecosystems. A threshold for surface water acidification was based on the acid neutralizing capacity;

(g) Task Force on Health. Various relationships between ambient concentrations of PM and O₃ and a range of health effects had been compiled. The risks differed between population groups. The impacts of O₃ and PM had no threshold, however, a cut-off level for O₃ was recommended for integrated assessment modelling. The stock at risk was essentially the whole population of Europe.

50. The current information on links between observations and critical thresholds, loads and levels included:

(a) ICP Forests. There was evidence that at sites in the United States of America the exceedance of critical loads for acidification and eutrophication had resulted in increased defoliation and increased tree mortality. The results also confirmed the findings in Europe that nitrogen deposition increased nitrate leaching;

(b) ICP Waters. Critical loads and their exceedances had been calculated for ICP Waters sites in Europe and would be compared with observed water chemistry and biology, mainly invertebrates. The work built on the “Report 83/2006; Critical loads, target load functions and dynamic modelling for surface waters and ICP Waters sites”;

(c) ICP Materials. The exceedances of the tolerable corrosion in 1997 at experimental sites of the programme were calculated for carbon steel, Zn and limestone and grouped according to the number of materials with exceeded rates. The highest exceedances occurred in industrial areas with high pollution levels, in urban areas with high traffic impact and in areas affected by sea-salt aerosols;

(d) ICP Vegetation. Field-based evidence for effects of O₃ on crops and (semi-) natural vegetation would be collated in 2006–2007;

(e) ICP Integrated Monitoring. The links on acidification would be assessed using site-specific dynamic modelling for calculating critical and target loads; heavy metal budgets were calculated;

(f) ICP Modelling and Mapping. ICPs with monitoring activities had been encouraged to collaborate with ICP Modelling and Mapping to validate maps of critical loads and their exceedances for acidification and eutrophication;

(g) Task Force on Health. The health effects of O₃ and PM were based on the analysis of data from available epidemiological studies, which compared the incidence of effects in populations exposed to various pollution levels and were supported by evidence from clinical and toxicological studies.

51. The Working Group on Effects acknowledged the importance of the collaborative work on cross-cutting issues, in particular on the workplan items common to all programmes, and:

(a) Took note of the interim results presented by the ICPs from the three workplan items common to all programmes and encouraged them to report them by the end of November 2006 and to complete the work on these items as proposed in the draft 2007 workplan;

(b) Invited the Joint Expert Group on Dynamic Modelling to discuss the three items common to all programmes at its seventh meeting and submit its conclusions to the secretariat by the end of November 2006.

H. Information on forthcoming workshops/technical meetings

52. Organizers and/or representatives of the host countries provided information on proposed forthcoming workshops and technical meetings. The Working Group welcomed:

(a) The workshop “Enterprise Monitoring and Reporting”, 4–6 September, Warsaw;

(b) The workshop “Confounding Factors in Recovery from Acid Deposition in Surface Waters” (ICP Waters in collaboration with ICP Integrated Monitoring), 9–10 October 2006, Bergen (Norway);

(c) Seventh meeting of the Joint Expert Group on Dynamic Modelling, 25–27 October 2006, Sitges (Spain);

(d) Workshop “Atmospheric Ammonia: Detecting Emission Changes and Environmental Impacts”, 4–6 December 2006, Edinburgh (United Kingdom);

(e) Workshop on future air pollution policy (“Saltsjöbaden III”), spring 2007 (tentative), Sweden;

(f) Workshop on ecosystem effects of low levels of atmospheric nitrogen deposition, March 2007 (tentative), Sweden;

(g) Workshop on the effects of heavy metals (ICP Modelling and Mapping), late 2007 (tentative);

(h) Agreed to add these workshops to its workplan and the provisional list of meetings for 2006/2007.

VI. FURTHER DEVELOPMENT OF THE EFFECTS-ORIENTED ACTIVITIES AND THEIR CONTRIBUTION TO THE REVIEW OF PROTOCOLS

A. Draft 2007 workplan

53. In introducing the draft 2007 workplan for the further development of the effects-oriented activities (ECE/EB.AIR/WG.1/2006/4), the Chair noted its preparation had followed the Executive Body's invitation to harmonize as much as possible the workplans of the Working Group and the EMEP Steering Body. A medium-term workplan for 2006–2009 was made available as an informal document.

54. The Working Group on Effects:

- (a) Took note of the results of the joint meeting of its Extended Bureau and the Bureau of the EMEP Steering Body held in March 2006;
- (b) Agreed on the importance of continued collaboration with the EMEP Steering Body, in particular with its Bureau and programme centres, to ensure that the Convention's priorities were addressed effectively;
- (c) Approved the 2007 workplan for the further development of the effects-oriented activities (ECE/EB.AIR/WG.1/2006/4), as amended, and agreed to submit it as a revised document to the Executive Body;
- (d) Agreed that the 2007 workplan items might be used as a basis for the partial financing of the programmes by the Trust Fund;
- (e) Took note of the EU/LIFE project "Consortium for the modelling of air pollution and climate strategies" (EC4MACS), which would include effects-based work and deliverables of CCE in the period 2007–2011;
- (f) Noted that ICP Forests had prepared an action plan for 2006/2007 instead of developing a new strategy.

B. Joint report

55. The Chair introduced the current structure of the joint report and emphasized the importance of continuing to report annual workplan items. The Bureaux of the Working Group on Effects had proposed to deliver the input for review of the Gothenburg Protocol in a separate document mainly based on the 2006 workplan items common to all programmes.

56. The Working Group on Effects agreed to continue to report the 2007 workplan items and prepare a separate document for the input for the review of the Gothenburg Protocol.

C. Review of the 1999 Gothenburg Protocol

57. The secretariat introduced the plans to prepare the main review document and noted the proposed timetable (ECE/EB.AIR/WG.5/82, annex). The Working Group on Effects agreed with the plans (ECE/EB.AIR/WG.1/2006/18), decided to declare its readiness to deliver the requested input and took note of the timetable.

D. Draft data rules

58. The secretariat presented a draft Executive Body decision on data availability under the Convention, which was discussed by the Bureaux of the Working Group on Effects and the EMEP Steering Body in March 2006. The Working Group on Effects adopted the draft, as amended, and entrusted its Chair to present it to the EMEP Steering Body session as an informal document and asked the Bureau of the Working Group to prepare a document for presentation to the twenty-fourth session of the Executive Body.

VII. FUNDING OF EFFECTS-ORIENTED ACTIVITIES

59. The secretariat introduced a note on the financing of effects-oriented activities, prepared by the Bureau of the Working Group in collaboration with the secretariat (ECE/EB.AIR/WG.1/2006/13), in line with decision 2002/1 of the Executive Body. The secretariat presented updated information for tables 2 and 3 of the document showing the recent developments in the Trust Fund. It announced updates for table 4 with additional recent contributions in kind: in 2005, Germany contributed the equivalent of US\$ 12,665 to CCE, and Sweden the equivalent of US\$ 22,238 to the Programme Centre of ICP Integrated Monitoring.

60. The Working Group requested its Bureau to revise document ECE/EB.AIR/WG.1/2006/13 to ensure the text was consistent with that used by the Executive Body in decision 2002/1 and to replace the last sentence of paragraph 15 with “A primary aim should be to ensure full financial contribution from the Parties in accordance with Executive Body’s decision 2002/1. A review mechanism for the distribution of the contribution may have to be developed based on the needs of international coordination and priorities of the core activities”. The Bureau agreed to this.

61. The Working Group on Effects:

(a) Decided to amend the budget in ECE/EB.AIR/WG.1/2006/13, table 1, by having 100 and 40 thousand US\$ for “Monitoring and assessment” and “Dose-response”, respectively, for ICP Forests;

(b) Approved the table showing the 2007 essential coordination costs of US\$ 2,152,700 for different elements of the effects-oriented activities and the provisional cost estimate of US\$ 2,152,700 for 2008 and 2009, for submission to the Executive Body;

- (c) Approved the note on funding of the effects-oriented activities (ECE/EB.AIR/WG.1/2006/13), as amended, and agreed to submit it to the Executive Body;
- (d) Decided to make it available for information to the Working Group on Strategies and Review, noting that Parties may propose it as an item to be discussed at that Working Group's next session;
- (e) Noted with appreciation the essential support provided to the Working Group and its effects-oriented activities by lead countries, countries hosting coordinating centres and organizing meetings, and countries funding activities of their national focal centres as well as active participation of national experts in the work under the Convention;
- (f) Noted with appreciation the cash contributions made in 2006 but reiterated its invitation to all Parties which have not yet done so, to provide without undue delay contributions decided by the Executive Body in its decision 2002/1 to the Trust Fund for financing the effects-oriented activities and noted that contributions can be made as instructed in the annex of the report;
- (g) Noted with satisfaction the continuing effective work of the Programme Centres for all ICPs, especially the work accomplished by ICPs and the Task Force on Health partially funded by the Trust Fund (see document ECE/EB.AIR/WG.1/2006/13) and with summarized results in 2006 joint report (ECE/EB.AIR/WG.1/2006/3), noting that the workshop "Confounding Factors in Recovery from Acid Deposition in Surface Waters" of ICP Waters and ICP Integrated Monitoring would be held in October and should be reported to the twenty-fourth session of the Executive Body;
- (h) Took note of the invitation of the Working Group of Strategies and Review (ECE/EB.AIR/WG.5/82, item 31 (b)) to identify specific tasks or activities which could be supported by individual Parties as contributions in kind, in accordance with decision 2002/1; considered this going beyond the decision 2002/1 concerning the international coordination of core activities; noted that it was not yet able to identify activities that could be offered to Parties for support outside the decision 2002/1 and asked its Bureau and the programmes to suggest such activities; took note of the pilot project of the Working Group on Strategies and Review to produce a substantiation document for use with requests for contribution with selected Parties.

VIII. ELECTION OF OFFICERS

62. Mr. T. Johannessen (Norway) was elected Chair. Mr. H.-D. Gregor (Germany) was elected Vice-Chair. Mr. B. Achermann (Switzerland), Mr. W. Mill (Poland) and Ms. A. C. Le Gall (France) were re-elected Vice-Chairs. Mr. F. Conway had informed that he was not able to stay in office. The Working Group decided to entrust the Bureau to co-opt until its next session a member of the Bureau from North America. The Working Group appreciated the considerable contribution of its Chair and the Bureau to the recent important results and expressed its gratitude.

IX. OTHER BUSINESS

63. The secretariat presented a provisional list of meetings for 2006/2007 and invited all Parties and programmes to communicate to it any amendments or new information.

64. The Working Group took note of the wish from the secretariat of the Arctic Monitoring and Assessment Programme (AMAP) to continue collaboration.

65. The Chair informed the Working Group that its twenty-sixth session was tentatively scheduled for 29–31 August 2007, starting on Wednesday, 29 August 2007, at 10 a.m.

Annex I**BANKING INFORMATION ON THE CONVENTION “LUA” TRUST FUND**

1. Contributions should be made by bank transfer. Four currency accounts are available (US dollar, Swiss franc, euro and pound sterling). The contributions should be addressed to the United Nations Economic Commission for Europe (UNECE).

2. Each contribution must be clearly referenced **indicating the year for which the contribution is made** and stating "**LUA-ECE/EOA**" (earmark specific **programme** or coordinating centre, if applicable) for the Trust Fund, for core activities not covered by the EMEP Protocol.

3. To ensure that all contributions are allocated to the correct fund, each time payment is made it is important to send details specifying the amount contributed as well as the date and purpose of the payment to the secretariat (Mr. Matti Johansson, UNECE, Office 323, Palais des Nations, CH-1211 Geneva 10, Switzerland, or e-mail: matti.johansson@unece.org).

4. The four currency accounts are:

a) US dollar deposit:

Account number: 485-001802
Account currency: USD
Account title: UN Geneva General Fund
Bank name: JP Morgan Chase Bank, New York
Bank address: International Agencies Banking
1166, Avenue of the Americas, 17th Floor
New York, N.Y. 10036-2708, USA
ABA (US Bank Code): 021000021 (specific for US use)
Swift Code: CHAS US 33
Reference: "LUA-ECE/EOA"

b) Swiss franc deposit:

Account number: 240-C0590160.0
Account currency: CHF
Account title: UN Geneva General Fund
Bank name: UBS AG
Bank address: Rue de Rhone 8
CH-1211 Geneva 2

Bank clearing code : 240

Swift Code: UBSW CH ZH 12A

IBAN Number: CH92 0024 0240 C059 0160 0

Reference: "LUA-ECE/EOA"

c) Euro deposit:

Account number: 23961901

Account currency: EUR

Account title: UN Office at Geneva

Bank name: JP Morgan Chase Bank

Bank address: 125 London Wall, London

EC2Y 5AJ

United Kingdom

Swift Code: CHAS GB 2L

Sorting Code: 60-92-42

IBAN Number: GB25 CHAS 6092 4223 9619 01

Reference: "LUA-ECE/EOA"

d) Pound sterling deposit:

Account number: 23961903

Account currency: GBP

Account title: UN Office at Geneva

Bank name: J.P. Morgan Chase Bank

Bank address: 125 London Wall, London

EC2Y 5AJ

United Kingdom

Swift Code: CHASGB2L

Sorting Code: 60-92-42

IBAN Number: GB68 CHAS 6092 4223 9619 03

Reference: "LUA-ECE/EOA"

Annex II**PROVISIONAL LIST OF EFFECTS-RELATED MEETINGS FOR 2006/2007**

11–15 December 2006 Geneva	Executive Body for the Convention (twenty-fourth session)
16–20 April 2007 Geneva	Working Group on Strategies and Review (thirty-ninth session)
29–31 August 2007 Geneva	Working Group on Effects (twenty-sixth session)
3–5 September 2007 Geneva	EMEP Steering Body (thirty-first session)
17–21 September 2007 Geneva	Working Group on Strategies and Review (fortieth session)
10–14 December 2007 Geneva	Executive Body for the Convention (twenty-fifth session)

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9–10 October 2006 Bergen (Norway)	Workshop on confounding factors in recovery from acid deposition in surface waters (ICP Waters in collaboration with ICP Integrated Monitoring)
11–12 October 2006 Bergen (Norway)	Programme Task Force, ICP on Assessment and Monitoring of Acidification of Rivers and Lakes (twenty-second meeting)
17–19 October 2006 Almaty (Kazakhstan)	Workshop on international air monitoring, data, reporting and environmental effects (UNECE project CAPACT)
25–27 October 2006 Sitges (Spain)	Joint Expert Group on Dynamic Modelling (seventh meeting)
4–6 December 2006 Edinburgh (United Kingdom)	Workshop on atmospheric ammonia: detecting emission changes and environmental impacts
March 2007 (tentative)	Workshop on Future Air Pollution Policy (“Saltsjöbaden III”)
5–9 March 2007 Dubna (Russian Federation)	International Cooperative Programme (ICP) on Effects of Air Pollution on Natural Vegetation and Crops (twentieth meeting)
13–14 March 2007 Paris (France)	Programme Task Force, ICP on Effects of Air Pollution on Materials, Including Historic and Cultural Monuments (twenty-third meeting)
27–28 March 2007 Bonn (Germany) (tentative)	Joint Task Force on the Health Aspects of Air Pollution (tenth meeting)
23–27 April 2007 Sofia (Bulgaria)	Coordination Center for Effects (CCE) workshop (seventeenth meeting); Programme Task Force, ICP on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends (twenty-third meeting)

2–4 May 2007 Prague (Czech Republic)	Task Force on Integrated Assessment Modelling (thirty-third meeting)
9–11 May 2007 Grafenau (Germany)	Programme Task Force, ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems (fifteenth meeting)
12–16 May 2007 (tentative) Zvolen (Slovakia)	Programme Task Force, ICP on Assessment and Monitoring of Air Pollution Effects on Forests (twenty-third meeting)
October 2007 (tentative) France	Programme Task Force, ICP on Assessment and Monitoring of acidification of Rivers and Lakes (twenty-third meeting)
Autumn 2007 (tentative)	Joint Expert Group on Dynamic Modelling (eighth meeting)