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LONG-RANGE TRANSBOUNDARY AIR POLLUTION

Working Group on Effects
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**MEDIUM-TERM WORK-PLAN FOR THE EFFECT-ORIENTED ACTIVITIES:
2004 UPDATE**

Note by the Bureau of the Working Group on Effects in collaboration with the secretariat

Introduction

1. At its twenty-first session, the Executive Body for the Convention took note of the updated medium-term work-plan for the further development of the effect-oriented activities (EB.AIR/WG.1/2003/4), as amended in the report on the twenty-second session of the Working Group on Effects (EB.AIR/WG.1/2003/2, paras. 44-46), and including the work-plan elements for the Joint Expert Group on Dynamic Modelling. The Executive Body also invited the Working Group on Effects and the Steering Body of EMEP to continue their close cooperation in implementing the priority tasks of the Convention (ECE/EB.AIR/79, para. 64 (e)).
2. Taking into account the recent decision of the Executive Body as well as information on progress in the Clear Air for Europe (CAFE) programme of the European Commission, the Extended Bureau of the Working Group on Effects (the Bureau of the Working Group, the Chairs of the Task Forces, and the representatives of the programme centres of the International

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Cooperative Programmes (ICPs)) at its meeting in March 2004 updated the medium-term work-plan (EB.AIR/WG.1/2003/4) and amended specific tasks to be carried out by individual programmes in 2004/2005. To ensure efficient cooperation and, in particular, the required harmonization of timetables with relevant activities of EMEP, the amended work-plan for the effect-oriented activities was further considered at the third joint meeting of the Bureaux of the Working Group on Effects and the EMEP Steering Body.

3. The Extended Bureau of the Working Group agreed not to amend the long-term strategy of the effect-oriented activities (EB.AIR/WG.1/2001/4). However, it decided to initiate discussion on it at the twenty-third session of the Working Group, partly in preparation for the joint Convention and European Commission workshop on the review and assessment of European air pollution policies (to be held on 25–27 October 2004 in Gothenburg, Sweden).

4. The prime objective of the effect-oriented activities for the forthcoming period remained the timely finalization of the 2004 substantive report on the review and assessment of air pollution effects and their recorded trends.

5. The Extended Bureau of the Working Group emphasized the harmonization of common input data in the programmes. It took note of the needs to link observations from ICP network sites to critical load mapping, to make use of the commonly agreed land-cover data as well as pollutant loads and their scenarios.

6. Further cooperation between ICPs and the Task Force on Health was encouraged. This included, for example, collation of materials for a possible review of the 1998 Protocol on Heavy Metals Protocol and synergies in dynamic modelling studies, which were part of the work of most or all programmes.

7. The other most important tasks of ICPs and the Task Force on Health for the forthcoming year (September 2004–August 2005) are listed below. The principal deliverables of the effect-oriented activities planned for the 2004–2006 period, in particular those intended as a contribution to, and technical/scientific support for, the future review of the protocols to the Convention are summarized in the table below.

8. ICP on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests)

- Continue large-scale crown condition assessment (level I) and intensive monitoring (level II);
- Assessment of critical loads (with ICP Modelling and Mapping and the United States Department of Agriculture's Forest Service);
- Assess carbon-nitrogen interactions (C/N) and nitrogen effects in forested ecosystem (with ICP Integrated Monitoring and ICP Modelling and Mapping) and the trends of N in wet deposition;

- Develop concentration- and flux-effect ozone models for trees and assess geographical distribution of ozone injuries in forests;
- Further development of data management and evaluation strategy.

9. ICP on Assessment and Monitoring of Acidification of Rivers and Lakes (ICP Waters)

- Evaluate sulphate and nitrogen trends in surface waters (with EMEP);
- Update critical loads of surface waters at monitoring sites;
- Dynamic modelling of surface water chemistry and biology;
- Trends and links to chemistry in biological recovery;
- Assessment of persistent organic pollutants (POPs) in aquatic biota.

10. ICP on Effects of Air Pollution on Materials, including Historic and Cultural Monuments (ICP Materials)

- Statistical evaluation of results from the multi-pollutant exposure programme;
- Further development of dose-response functions based on the multi-pollutant exposure programme and the one-year extension programme;
- Apply programme results for mapping of areas with increased risk of corrosion;
- Threshold levels for effects of particulate matter (PM) on materials;
- Develop the activities of the programme's sub-centre on cultural heritage and stock at risk.

11. ICP on Effects of Air Pollution on Natural Vegetation and Crops (ICP Vegetation)

- Compile ozone critical level exceedance maps based on the new critical levels for ozone (with the EMEP Meteorological Synthesizing Centre – West (MSC-W));
- Analyse the extent and trends of ozone damage to vegetation (crops and (semi-) natural vegetation);
- Study interactive impacts of ozone and nitrogen on crops and (semi-) natural vegetation;
- Analyse temporal trends in the nitrogen concentration in European mosses;
- Monitor the deposition of heavy metals using (semi-) natural vegetation and mosses, including preparing for and conducting the "European heavy metals in mosses survey".

12. ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems (ICP Integrated Monitoring)

- Report/publication on observed trends in sulphur and nitrogen fluxes;
- Estimation of cumulative N deposition and its effects (with the Coordination Center for Effects);

- Assess the nitrogen/carbon interactions and nitrogen effects in forested ecosystem (with ICP Forests and ICP Modelling and Mapping);
- Submit a scientific paper on heavy metals;
- Calculation of critical loads using monitoring site data.

13. ICP on Modelling and Mapping of Critical Levels and Loads and Air Pollution Effects, Risks and Trends (ICP Modelling and Mapping)

- Updating and evaluation of critical loads for acidification and eutrophication and target load functions for acidification;
- First results of large-scale dynamic modelling related to acidification and nutrient nitrogen;
- Updating and evaluation of critical loads for heavy metals (Pb, Cd, Hg);
- Further development of risk assessment methodologies and robustness assessment;
- Evaluation and harmonization of ecosystem data, including base cation deposition and land cover maps (with all ICPs, EMEP and other organizations).

14. Task Force on the Health Aspects of Air Pollution (Task Force on Health)

- Assess health impacts of particulate matter and ozone based on exposure estimates produced by the RAINS model, including the preparation of assessment reports;
- Apply the results from the hazard assessment of particulate matter and ozone to health impact assessment of these pollutants and the preparation of the comprehensive summary reports;
- Develop a methodology to include morbidity estimates in quantification of health impacts of particulate matter and ozone;
- Initiate the review of new scientific findings allowing improved assessment of health risks of heavy metals from long-range transboundary air pollution;
- Support the health risk assessment of (new) persistent organic pollutants (POPs) considered by the Working Group on Strategies and Review.

15. Joint Expert Group on Dynamic Modelling

- Develop a method for assessing site-specific simulation results within a regional context;
- Formulate an agreed description of nitrogen processes for dynamic models determined and evaluated;
- Support both the calculation of critical loads and simulation with dynamic models at monitoring sites of all ICPs;
- Develop an agreed methodology for the application of dynamic models in setting deposition targets;
- Evaluate the synergies in dynamic modelling work carried out in different ICPs.

Table Intended main deliverables of the effect-oriented activities for the medium-term work-plan

	2004	2005	2006
Acidity	<ul style="list-style-type: none"> • Trends and links to chemistry in biological recovery (W) • Progress report on biological dynamic modelling (W) • Multi-pollutant dose/response functions (MAT) • Updated critical loads maps (M&M) • Results of dynamic modelling on European scale to Task Force on Integrated Assessment Modelling (M&M; CIAM) 	<ul style="list-style-type: none"> • Progress report on dynamic modelling of recovery of surface water chemistry and biology (W) • Report on alkalinity (W) • Update of critical load of waters (W) • Threshold levels for multi-pollutant effects and mapping of areas of exceedance (MAT) • Network for trend analysis (MAT) • Updated critical loads and Europe-wide dynamic modelling results (M&M) • Acidification effects on vegetation (IM; F) • Progress report on dynamic modelling (IM) • Report on observed trends in S and N fluxes at IM sites (IM) (see Nutrient N) • Synergies in dynamic modelling (JEG; M&M, IM, W, F) 	<ul style="list-style-type: none"> • 18-year report (W) • Trends in acidity, growth and defoliation (F) • Updated trends in multi-pollutant corrosion effects (MAT) • Economic assessment of air pollution damage to materials including cultural heritage (MAT) • Updated critical loads and dynamic modelling, particularly synergy with heavy metals (M&M)
Nutrient nitrogen	<ul style="list-style-type: none"> • Trend analysis (F) • Updated maps of critical loads (M&M) • Progress report on N studies (IM) 	<ul style="list-style-type: none"> • Report/papers on N effects and C/N interaction (F; IM, M&M) • Relationships between N depositions, forest stand structure and species composition of ground vegetation (F) • Temporal trends in N content of mosses in Europe (V) • Updated critical loads (M&M) • Preliminary Europe-wide dynamic modelling (M&M) • Eutrophication effects on vegetation (IM; F) • Report on observed trends in S and N fluxes at IM sites (IM) (see: Acidity) 	<ul style="list-style-type: none"> • Trends in nutrient N, growth and defoliation (F) • Report on interactive impacts of ozone and nitrogen on crops and (semi-)natural vegetation (see Ozone) (V) • Assessment of threats from N deposition to biodiversity (M&M) • Updated critical loads and dynamic modelling (M&M)
Ozone (O₃)	<ul style="list-style-type: none"> • Trends in injury and biomass reduction (V) • Concentration- and flux-effect models for crops, semi-natural vegetation and trees (V; F) • Maps of revised critical levels of O₃ for Task Force on Integrated Assessment Modelling (V; F, M&M) • Exposure assessment and health risk (H) 	<ul style="list-style-type: none"> • Final geographical distribution of O₃ injuries in forests, incl. list of sensitive species (F) • Relationships between O₃ concentrations and ozone symptoms on forest vegetation (F) • Flux-effect model for clover (V) • Comparison of economic impacts on crops using concentration-based and flux-based approaches (V) • Identification of communities of (semi-)natural vegetation at risk (V) • Report on exposure assessment and health risk (H) 	<ul style="list-style-type: none"> • Intercalibration of passive sampling and ozone injury (F) • Report on interactive impacts of ozone and nitrogen on crops and (semi-)natural vegetation (see Nutrient N) (V) • Flux-effect models for additional crop species (V) • Flux-effect maps for agricultural species (V) • Risk assessment for (semi-)natural vegetation that includes the influence of modifying factors and improved mapping procedures (V)
PM	<ul style="list-style-type: none"> • Assessment of health effects of exposure (H) 	<ul style="list-style-type: none"> • Report on assessment of health effects of exposure (H) • Threshold levels for effects of PM on materials (MAT) 	<ul style="list-style-type: none"> • Costs and extent of soiling of monuments (MAT)
Heavy metals	<ul style="list-style-type: none"> • Report on factors influencing heavy metal content in mosses (V) • Agreed methodology for mapping critical loads of Pb, Cd and Hg (M&M) 	<ul style="list-style-type: none"> • Advanced maps of critical loads of Cd, Pb and Hg (M&M) • Second report on critical loads exceedances for Cd, Pb and Hg with improved maps (M&M; MSC-E) • Material for possible review of the Protocol (critical loads maps, risk assessment of other heavy metals (M&M, F, W, MAT, IM, V, H)) • Report on heavy metal deposition and potential contamination of food crops (V) • Scientific report on heavy metal (IM) 	<ul style="list-style-type: none"> • Monitoring of heavy metal in soil on forest sites (F) • Trends in heavy metal in mosses (V) • Update on progress with the 2005 moss survey (V) • Updated health risk assessment of heavy metal (H) • Updated critical loads and preliminary dynamic modelling, particularly synergy with acidity (M&M)
POPs	<ul style="list-style-type: none"> • Assessment of POPs in aquatic biota (W) 	<ul style="list-style-type: none"> • Material for possible review of the Protocol (for existing and new substances) (H) 	<ul style="list-style-type: none"> • Health aspects of new POPs (H)

(**W**): ICP Waters; (**F**): ICP Forests; (**MAT**): ICP Materials; (**V**): ICP Vegetation; (**M&M**): ICP Modelling and Mapping; (**IM**): ICP Integrated Monitoring; (**H**): Task Force on the Health Aspects of Air Pollution. (**JEG**): Joint Expert Group on Dynamic Modelling; (**MSC-E**): EMEP Meteorological Synthesizing Centre - East; (**CIAM**) EMEP Centre for Integrated Assessment Modelling.