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**ECONOMIC COMMISSION FOR EUROPE**

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

Working Group on Effects  
(Twenty-second session, Geneva, 3-5 September 2003)  
Item 5 (a) of the provisional agenda

**MEDIUM-TERM WORK-PLAN FOR THE EFFECT-ORIENTED ACTIVITIES;  
2003 UPDATE**

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

**I. INTRODUCTION**

1. At its twentieth 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.1/2002/4) and invited the Working Group on Effects and the Steering Body of EMEP to continue their close cooperation in implementing its priority tasks (ECE/EB.AIR/77, para. 61 (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 at its meeting in February 2003 updated the medium-term work-plan for 2002-2004 and amended specific tasks to be carried out by individual programmes in 2003/2004. To ensure efficient cooperation and, in particular, the required harmonization of timetables with relevant activities of EMEP, the amended work-plan for the

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effect-oriented activities was further considered at the second joint meeting of the Bureaux of the EMEP Steering Body and the Working Group on Effects.

3. The Extended Bureau of the Working Group also concluded that at present there was no reason to change and/or amend the long-term strategy of the effect-oriented activities (EB.AIR/WG.1/2001/4). It noted, however, the importance of climate change issues when considering the longer-term effects of air pollution.

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 present air pollution effects and their recorded trends, which would provide the necessary background information for effect-based reviewing and/or updating of the existing protocols.

5. The other most important tasks of the International Cooperative Programmes and the Task Force on the Health Aspects of Air Pollution for the forthcoming year (September 2003-August 2004) are listed below. The principal deliverables of the effect-oriented activities planned for the 2003-2005 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.

6. ICP on Assessment and Monitoring of Air Pollution Effects on Forests

- Continue level I crown condition assessment and level II intensive monitoring, and preparation of level I soil survey;
- Participate in developing updated critical levels of ozone for trees (with ICP Vegetation);
- Assess forest biodiversity on level II plots (test phase);
- Further improve data quality assurance;
- Update the ICP Forests manual.

7. ICP on Assessment and Monitoring of Acidification of Rivers and Lakes

- Finalize the fifteen-year report (including progress reports on trends in chemistry and biology of surface waters, dynamic modelling and heavy metals);
- Continue maintaining the ICP Waters database;
- Carry out an in-depth review of biological recovery of surface waters;
- Organize the 2003 chemical (including heavy metals) and biological intercalibrations;
- Update the ICP Waters manual for acidification and heavy metals.

8. ICP on Effects of Air Pollution on Materials, including Historic and Cultural Monuments

- Planning and organizing activities based on the newly established sub-centre for cultural heritage and stock at risk;
- Development of new dose-response functions based on the multi-pollutant exposure programme and the one-year extension programme (MULTI-ASSESS);
- Trend analysis of corrosion and pollution based on the extension of data obtained earlier with results obtained during the 2003 exposure;

- Use of the results obtained for mapping areas with exceedances of threshold levels on different geographical scales in Europe and for calculating the costs of damage;
- Coordinated release of information from the activities of ICP Materials and the MULTI-ASSESS project of the European Commission by workshops, linked web pages and publications;
- Workshop on the cost of damage caused by air pollution on materials including cultural heritage in collaboration with the Centre for Integrated Assessment Modelling (CIAM).

9. ICP on Effects of Air Pollution on Natural Vegetation and Crops

- Continue to monitor the extent of ozone damage to vegetation in the ECE region;
- Develop further the ozone flux-effect model for clover;
- Analyse trends in clover biomass and ozone injury development (1993-2003);
- Develop procedures for mapping the semi-natural vegetation communities at risk from ozone;
- With ICP Modelling and Mapping, develop maps showing exceedance of the revised critical levels of ozone;
- Initiate a study of the spatial and temporal trends in the N content in mosses (1980-2000), including, if possible, herbarium samples for selected sites;
- Consider trends in the heavy metals in mosses database and the causes of sub-grid variation in heavy metal concentrations.

10. ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems

- Continue to maintain the ICP Integrated Monitoring network, harmonize and update the international database;
- Compile the ICP Integrated Monitoring Thirteenth Annual Report 2004;
- Draft a scientific paper on the calculation of cumulative nitrogen deposition and its effects;
- Finalize a scientific paper on pools and fluxes of heavy metals at ICP Integrated Monitoring sites;
- Finalize a scientific paper on the long-distance nitrogen air pollution effects on lichens in Europe.

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

- Revise the structure and content of the Mapping Manual;
- Update the methodologies and final data requirements for the support of a future review and possible revision of the 1999 Gothenburg Protocol;
- Prepare a call for critical loads data for acidification and eutrophication, dynamic modelling inputs and outputs for use in integrated assessment modelling;
- Contribute to the further development of methodologies for deriving and mapping critical loads for heavy metals in support of a future review and possible revision of the 1998 Aarhus Protocol;
- Contribute to the development of methodologies and define data requirements in support of the modelling and mapping of ozone critical levels/fluxes;
- Contribute to the development of an effect-based frame of reference to assist in modelling and mapping activities in support of policies which link climate change and air pollution.

12. Task Force on the Health Aspects of Air Pollution

- Analyse the health impacts of particulate matter and ozone using newly developed models for the long-range transport of air pollutants and applying the most recent concentration-response functions;
- Continue updating the review of the health effects of heavy metals and persistent organic pollutants from long-range transboundary air pollution.

Table. Medium-term work-plan: intended deliverables of the effect-oriented activities for individual pollutants and years

	Acidity	Nutrient N	Ozone ( $O_3$ )	PM	Heavy metals (HM)	POPs
2003	Evaluating critical loads and dynamic models at ICP Forests sites (F, MAP) Modelling of effects in surface waters (W) Updated trends in corrosion effects (MAT) Proton budget calculations (IM) Effects on vegetation (IM) Updated critical loads maps (MAP) Preliminary results of dynamic modelling (MAP)	Effects on vegetation (IM) Updated critical loads maps (MAP) Site-specific dynamic modelling (IM)	Concentration- and flux-effect models for crops, semi-natural vegetation and trees (V, F) Preliminary maps of revised critical levels of $O_3$ (V) Approved methodology for $O_3$ mapping (V, MAP) Database on response of natural vegetation to $O_3$ (V) Review of health effects (H)	Updated review of health effects (H)	Critical loads and risk assessment of HM (F, MAP) Assessment of HM release due to corrosion (MAT) Report from HM in mosses 2000/2001 survey (V) Scientific paper on HM concentrations/fluxes (IM)	Review of health risks from long-range transboundary air pollution (H)
2004	Modelling biological recovery (W) Multi-pollutant dose/response functions (MAT) Threshold levels for multi-pollutant effects and mapping of areas of exceedance (MAT) Dynamic modelling (IM) Recovery and trends on IM sites (IM) Updated critical loads maps (MAP) Results of dynamic modelling on European scale to TFIAM (MAP)	Trend analysis (F) Recovery and trends on IM sites (IM) Updated maps of critical loads (MAP) Dynamic modelling (IM) Preliminary dynamic modelling: European scale (MAP);	Geographical distribution of $O_3$ injuries in forests, incl. list of sensitive species (F) Trends in injury and biomass reduction (V) Final maps of revised critical levels of $O_3$ for TFIAM (V, F, MAP) Exposure assessment and health risk (H) Flux-effect model for clover (V)	Preliminary threshold levels for effects of PM on materials (MAT) Assessment of health effects of exposure (H)	Assessment of HM in soil on forest sites; update (F) Report on factors influencing HM content in mosses (V) Agreed methodology for mapping critical loads of Pb, Cd (MAP)	Assessment of POPs in aquatic biota (W)
2005	Updated critical loads and dynamic modelling results (MAP, JEG)	Updated critical loads and dynamic modelling results (MAP, JEG) Relationships between N depositions, forest stand structure and species composition of ground vegetation (F) Spatial and temporal trends in N content of vegetation in Europe (V)	Comparison of economic impacts on crops using concentration-based and flux-based approaches (V) Mapping plant communities at risk (V, MAP) Relationships between $O_3$ concentrations and ozone symptoms on forest trees (F)	Final threshold levels for effects of PM on materials (MAT)	Advanced maps of critical loads of Cd and Pb (MAP) First report on critical loads exceedances for Cd and Pb with improved maps (MAP, in cooperation with MSC-E) Material for possible review of the Protocol (critical loads maps, risk assessment of other HM (MAP, F, W, MAT, IM, V, H)) Trends in HM in mosses (V) Proposal for effect-based approach for Hg (MAP)	Material for possible review of the Protocol (for existing and new substances) (MAP, IM, V, H)

(F): ICP Forests; (H): Task Force on the Health Aspects of Air Pollution; (IM): ICP Integrated Monitoring; (JEG): Joint Expert Group on Dynamic Modelling; (MAP): ICP Modelling and Mapping; (MAT): ICP Materials; (V): ICP Vegetation; (W): ICP Waters; (TFIAM): Task Force on Integrated Assessment Modelling.