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ECONOMIC COMMISSION FOR EUROPE

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

Steering Body to the Cooperative Programme for Monitoring and Evaluation
of the Long-range Transmission of Air Pollutants in Europe (EMEP)
(Twenty-sixth session, Geneva, 2-4 September 2002)
Items 5 and 6 of the provisional agenda

DRAFT WORK-PLAN FOR 2003Note prepared by the secretariat in consultation with the Bureau

This work-plan for EMEP will become part of the work-plan for the Convention. The numbering of items has been kept as for the Convention's work-plan, which will be adopted by the Executive Body. The draft has been based on the priorities for the work up to 2004 (EB.AIR/GE.1/2001/9) adopted by the EMEP Steering Body at its twenty-fifth session.

All work items listed below will be undertaken in close cooperation with Parties and national experts, and, where relevant, with other bodies under the Convention. Wherever relevant and possible, the EMEP centres (Chemical Coordinating Centre (CCC), Centre for Integrated Assessment Modelling (CIAM), Meteorological Synthesizing Centre-East (MSC-E) and Meteorological Synthesizing Centre-West (MSC-W)) will cooperate with other organizations, programmes and projects, including the Arctic Monitoring and Assessment Programme (AMAP), the EUREKA Project on the Transport and Chemical Transformation of Environmentally Relevant Trace Constituents in the Troposphere over Europe: Second Phase (EUROTRAC-2), the European Commission's Clean Air for Europe (CAFE) programme, the European Environment Agency (including its Topic Centre for Air and Climate Change), the International Geosphere-Biosphere Programme (IGBP) and its International Global Atmospheric Chemistry (IGAC), activity, the marine commissions, the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), including its Global Atmosphere Watch (GAW) programme.

Documents prepared under the auspices or at the request of the Executive Body for the Convention on Long-range Transboundary Air Pollution for GENERAL circulation should be considered provisional unless APPROVED by the Executive Body.

2.1 EMISSIONS

Description/objectives: Further develop the EMEP emission inventory, based on data submitted by Parties, provide information on emissions and projections that is transparent, consistent, comparable, complete and accurate, assist in the review of compliance, and provide assistance to Parties to help them fulfil their reporting tasks. The Task Force on Emission Inventories and Projections, led by the United Kingdom until August 2003, with assistance by the centres, will provide a technical forum and expert network to share information, harmonize emission factors, establish methodologies for the evaluation of emission data and projections, and identify and resolve problems related to reporting.

Main activities and time schedule:

(a) The Task Force on Emission Inventories and Projections will continue to update and promote the Guidebook, including through work on heavy metals and particulate matter. It will work with Parties to improve the quality and completeness of emission reporting with a focus on validation and good practice. A workshop on validation/evaluation of emission inventories will be held on 14 – 16 October 2002. The twelfth meeting of the Task Force and an associated European Environment Information and Observation Network (EIONET) workshop will take place in Warsaw on 22-24 September 2003;

(b) By 15 February 2003, as requested by the secretariat and in accordance with the new Guidelines for estimating and reporting emissions data, Parties should submit 2001 emission data and projections, at the requested sectoral, temporal and spatial distribution, for sulphur, NO_x, non-methane volatile organic compounds (NMVOCs), NH₃, particulate matter (PM), CO, heavy metals (priority metals: cadmium (Cd), mercury (Hg) and lead (Pb)) and selected persistent organic pollutants (POPs). Gridded data should reach the secretariat no later than 1 March 2003. Parties should, moreover, identify large point sources, as defined in the Guidelines, of these substances to facilitate the precise inputs of the emissions from major sources in the EMEP models. A summary of required emissions data is given in table 1 at the end of this document. Parties should ensure that data previously submitted are updated as necessary and that data are available for the protocol base years;

(c) MSC-W will compile the data and assure data quality, update the inventory database and make the emission database directly accessible via the Internet as soon as the internal consistency is evaluated. It will present a report on 1980-2001 emissions. CIAM will support work on projections. MSC-E and CCC will support work on heavy metal and POP emission data.

2.2 ATMOSPHERIC MEASUREMENTS AND MODELLING

Description/objectives: Assess the results of implementing the protocols to the Convention and develop and ensure support for the atmospheric measurement and modelling tools necessary for further international air pollution abatement policies, including the review of protocols. The Task Force on Measurements and Modelling, led by Austria and co-chaired by WMO, with the assistance of the centres, supports the Steering Body and its Bureau by: (i) reviewing and assessing the scientific and operational activities of EMEP related to monitoring and modelling; (ii) evaluating their contribution to the effective implementation and further development of the protocols; and (iii) drawing up specific proposals. It provides for closer collaboration among the Parties to the Convention, the centres, other bodies under the Convention, other international bodies and the scientific community in strengthening scientific communication and cooperation in air pollution monitoring and modelling.

Main activities and time schedule:

(a) The Task Force on Measurements and Modelling will investigate the trends in transboundary fluxes, concentrations and depositions over the lifetime of EMEP in different regions, making use of measurements and modelling results in preparation of an assessment report. Experts from participating Parties will complete the national assessments by the end of 2002. CCC, MSC-E and MSC-W will assist Parties in the application of tools to assess their data. MSC-W will coordinate the input from national experts. CCC, MSC-E and MSC-W will also be responsible for the drafting, by March 2003, of the general part of the report, giving an overall European perspective with the following chapters: (1) acidification and eutrophication, (2) ozone, (3) heavy metals and POPs, (4) summary. The Task Force will organize a workshop on the assessment work in Vienna in autumn 2002. The assessment report will be presented to the Steering Body in September 2003;

(b) The Parties will report to CCC monitoring results for 2001 by 1 October 2002 and for 2002 by 1 October 2003. A summary of required monitoring data is given in table 2 at the end of this document. CCC will continue to collect monitoring data and evaluate and store them in the EMEP database. CCC will make the data available via the Internet once they have been checked. It will evaluate the data and report thereon to the Task Force. Data will be marked provisional until the Steering Body session following its approval. CCC will cooperate with EEA on the further development of the data exchange module (DEM) used for the submission of data to the EEA database. DEM will be optional for Parties to report data, as an alternative to the NASA Ames format. CCC will inform the Task Force on Measurements and Modelling of progress in further harmonizing reporting between EMEP and EEA, with the focus upon promoting the quality and consistency of data and reducing the burden on Parties;

(c) CCC, in consultation with the Task Force on Measurements and Modelling, will continue work to improve the EMEP Manual for Sampling and Chemical Analysis. It will update the quality assessment (QA) / quality control (QC) part of the Manual and expand the QA information available through the Internet. It will also include alternative ammonia monitoring methods developed in the United Kingdom in the Manual;

(d) The Task Force on Measurements and Modelling will continue to review the current monitoring strategy. This work will also cover ammonia, in cooperation with the ammonia expert group. CCC, in cooperation with MSC-E and MSC-W, will evaluate representativeness and site density to provide input into this work. They will further examine the approaches to combining modelling data with observations, such as data assimilation techniques. At selected sites, CCC will evaluate the regional representativeness and compare EMEP data with data from other monitoring networks. CCC will intensify collaboration with other national and international programmes to implement the 'level' approach for PM and extend it, where appropriate, to other pollutants. It will draft an outline for a new monitoring strategy for presentation to the Task Force at its fourth meeting. Parties, supported by CCC in close cooperation with EEA, will continue their efforts to improve the EMEP network in the Mediterranean and in Central and Eastern Europe. The Task Force will hold its fourth meeting in Valencia (Spain) in spring 2003 and present a proposal for a revised monitoring strategy to the Steering Body;

(e) MSC-W will, as a matter of the highest priority, prepare a review of the Eulerian unified (photo-oxidants, acid deposition, particle) model, including validation and the comparison of model results and observations, and report to the Task Force in spring 2003. The Task Force will present conclusions on the unified Eulerian model to the Steering Body. MSC-W will prepare a version of the Lagrangian model to be accessible to Parties' experts via the Internet;

(f) The centres, in consultation with the Task Force, will cooperate on extending the modelling work to cover the whole northern hemisphere. An EMEP workshop on hemispheric air pollution problems, co-sponsored by Germany and the United States, will be held on 7-9 October 2002 in Bad Breisig (near Bonn, Germany).

2.3 INTEGRATED ASSESSMENT MODELLING

Description/objectives: Analyse scenarios on cost-effective reduction of acidification, eutrophication, tropospheric ozone, particulate matter (PM) pollution and related phenomena, including POPs and heavy metals pollution. Modelling will cover: (i) abatement options for reducing sulphur, nitrogen oxides, ammonia, VOCs and primary particulate matter, including structural measures in energy, transport and agriculture, and their costs; (ii) projections of emissions; (iii) assessments of the atmospheric transport of substances (including hemispheric

transport); and (iv) analyses and quantification of environmental and health effects and benefits of emission reductions. Modelling will draw upon the results from other subsidiary bodies. The Task Force on Integrated Assessment Modelling, led by the Netherlands, will guide the work of CIAM at the International Institute for Applied Systems Analysis (IIASA). All activities will be conducted in close collaboration with related work led by the European Commission.

Main activities and time schedule:

(a) The Task Force on Integrated Assessment Modelling will continue to discuss modelling work by CIAM and other national and international initiatives. It will review progress in the preparation of model inputs covering all model elements and liaise with the responsible bodies under the Convention to this end. It will encourage and support national modelling activities carried out by National Focal Points for Integrated Assessment Modelling and enhance the sharing of data and experience with integrated assessment modelling work outside the EMEP region. It will hold its twenty-eighth meeting in spring 2003;

(b) CIAM will pursue work on uncertainty analysis using error propagation. Work done in collaboration with MSC-W will focus on uncertainties in atmospheric transport models and related non-linearities from numerical advection and atmospheric chemical processes;

(c) CIAM will examine, in cooperation with the Coordination Center for Effects, options for covering the results of dynamic modelling in integrated assessment modelling;

(d) CIAM, in cooperation with MSC-W will report on the differences between regional and urban scale modelling and draw conclusions for future modelling work. Together with the Environment Institute of the EC Joint Research Centre, the centres will conduct a series of model intercomparison workshops covering different urban models that apply the same emission data and meteorological assumptions. MSC-W will develop numerical methods to nest urban meso-scale models in the regional model;

(e) CCC, in cooperation with CIAM, will further develop criteria for POPs and heavy metals emission projections for selected scenarios, starting with work on cadmium and lead, and present results to the Task Force on Integrated Assessment Modelling;

(f) CIAM, in consultation with the Task Force, will study the possibility and resource requirements for extending work to the whole northern hemisphere. It will further study the links between air pollution and climate change. CIAM will also prepare for an evaluation of sectoral trends and discussion of possible baseline scenarios and scenarios of maximum feasible emission reductions taking into account the possibility of non-technical measures. The Task Force will hold a workshop on this topic at IIASA in Laxenburg (Austria) in winter 2002/2003.

2.4 ACIDIFYING AND EUTROPHYING COMPOUNDS

Description/objectives: Provide monitoring and modelling data on concentrations, depositions and transboundary fluxes of sulphur and nitrogen compounds over Europe. Analyse past, present and future exceedances of critical loads of acidifying and eutrophying depositions in Europe, in collaboration with the Coordination Center for Effects (CCE). Refine and complete emission data with specific focus on the spatial resolution. Support the preparations for the review of the Gothenburg Protocol.

Main activities and time schedule:

(a) MSC-W will calculate the transport of sulphur and nitrogen compounds with the unified Eulerian model. In cooperation with CCC, it will further validate the model by comparing model results with observations, including flux measurements, and further evaluating the differences between the Lagrangian and the Eulerian model. It will further develop the model based on these investigations. It will report on the validation of the model at the meeting of the Task Force on Measurements and Modelling in early 2003 and present a summary report at the twenty-seventh session of the Steering Body;

(b) CCC will arrange for laboratory comparisons of the main components in air and precipitation. These will be open to laboratories participating in monitoring programmes under the Working Group on Effects. CCC will start field comparisons for air chemistry for three sites and finalize and evaluate field comparisons for three other sites. CCC will investigate new methods for long-term flux monitoring for sulphur and nitrogen compounds, including dry and total deposition. It will continue to update metadata in the database;

(c) MSC-W, in cooperation with CCC, will provide an estimation of the base cation depositions so that they can be mapped on a European scale. It will prepare ecosystem-specific deposition maps in consultation with the Working Group on Effects and prepare, on that basis and in cooperation with CIAM, ecosystem-specific damage estimates for integrated assessment modelling.

2.5 PHOTO-OXIDANTS

Description/objectives: Provide monitoring and modelling data on concentrations and transboundary transport of ozone, NO_x and VOCs. Evaluate short- and long-term exposures to photochemical oxidants. Refine and complete emission data with specific focus on the spatial resolution. Analyse scenarios of ground-level ozone and exceedances of critical levels. Support the preparations for the review of the Gothenburg Protocol.

Main activities and time schedule:

(a) MSC-W will calculate the short-term exposures of vegetation to photochemical oxidants for vegetation growing periods, as well as the potential exposure of humans. It will apply the revised ozone level II dry deposition sub-routine and evaluate the influence of boundary conditions and background values on the short-term exposures to humans and ecosystems;

(b) CCC will increase its links with national and other existing monitoring networks to improve the geographic coverage of ozone and VOC monitoring data, including data for trend analysis. CCC will also evaluate the QA/QC procedures and prepare a proposal on parameters to be measured as part of the draft outline for the monitoring strategy (item 2.2 (d) above). In collaboration with participating laboratories, it will arrange for campaigns with parallel sampling and analyses of VOC;

(c) CIAM, in cooperation with MSC-W, will continue to evaluate the effects of control measures on photo-oxidants, paying particular attention to effects of scale. MSC-W and CIAM will, following the proposals developed under the Working Group on Effects (level II or revised level I approach), develop methods to evaluate exceedances of critical levels.

2.6 HEAVY METALS

Description/objectives: Provide monitoring and modelling data on concentrations, depositions and transboundary fluxes of cadmium (Cd), lead (Pb) and mercury (Hg). Develop further the Pb, Cd and Hg transport models in parallel with the development of heavy metal critical limits under the Working Group on Effects. Develop reliable emission data for Cd, Pb and Hg, as well as preliminary data set for other metals. Support preparatory work for the review of the Protocol on Heavy Metals.

Main activities and time schedule:

(a) MSC-E will prepare information for 2001 for Pb, Cd and Hg on: deposition and air concentrations fields in Europe with a resolution of 50 km x 50 km; country-to-country deposition matrices; and deposition to the regional seas. It will furthermore present: 1990-2000 pollution trends for Pb, Cd and Hg; estimates for Hg atmospheric transport on a hemispheric scale; and, in cooperation with CCE, critical load exceedance maps for Pb and Cd. In cooperation with CCC, it will compare modelling results with monitoring data;

(b) MSC-E will further develop its models and its input data. It will, in particular, improve the parameterization of: Hg behaviour in environmental compartments; Pb, Cd, Hg dry deposition to different underlying surfaces; wet removal processes; and mercury atmospheric chemistry. MSC-E will continue the Hg model intercomparison study. At stage III, the modelled

annual and monthly mean concentrations will be compared with measurements. At stage IV export-import balances for Italy, Poland and the United Kingdom will be compared;

(c) In cooperation with Parties, CCC will enhance the completion of the superstation network (about ten monitoring sites in defined areas). It will complement EMEP data with data from other international programmes. It will report on the intercomparison for sampling and analytical techniques for Hg and on the analytical intercomparison of the other seven heavy metals measured in precipitation (see table 1 below);

(d) MSC-E will prepare gridded anthropogenic emission data, based on officially submitted data and expert estimates, and collect available data on natural emissions. CCC and MSC-E, in consultation with national experts, will adjust European Hg emission inventories to modelling requirements. CCC will develop profiles of chemical species of heavy metal emissions.

2.7 PERSISTENT ORGANIC POLLUTANTS (POPs)

Description/objectives: Improve the monitoring and modelling data on concentrations, depositions and transboundary fluxes of selected POPs. Study further the physical-chemical processes of POPs in different environmental compartments, taking into account their transport within the EMEP region and on the hemispheric/global scale. Develop reliable emission data for the POPs listed in the Protocol, as well as preliminary data set for other substances. Support preparatory work for the review of the Protocol on POPs.

Main activities and time schedule:

(a) MSC-E will prepare information for 2000 on: transboundary transport of Benzo[a]pyrene (BaP) (deposition and concentration fields and country-to-country matrix); transport and accumulation of PCDD/Fs in various compartments; pilot calculations for long-range transport on a hemispheric scale of PCBs, HCB and γ -HCH; and deposition of selected POPs to the regional seas. It will furthermore present: 1970-2000 pollution trends for B[b]F and PCDD/Fs. It will support the Expert Group on POPs and its national experts in their work and contribute to work to develop an effects-based approach under the Working Group on Effects;

(b) MSC-E will further develop its models by: modifying the modelled behaviour in soil; modifying modelled air/sea exchange; refining the physico-chemical properties of PAHs, PCBs, γ -HCH, PCDD/Fs and HCB; evaluating the influence of sea ice on hemispheric transport of the POPs; and refining the model input data. It will start the model intercomparisons study and organize the first meeting with experts from the Czech Republic, Lithuania, Switzerland, the United Kingdom and the United States. Stage I will compare model descriptions of behaviour in environmental media and parameterization for long-range transport and accumulation in multi-compartment models;

(c) In cooperation with Parties, CCC will enhance the completion of the superstation network (five to ten sampling sites). In cooperation with MSC-E, it will complement EMEP data with data from other international and national programmes for comparison with model results;

(d) CCC and MSC-E, in consultation with the Task Force on Emission Inventories and Projections and Parties, will improve the POPs emission data quality. They will adjust European emission inventories for POPs to the modelling requirements. CCC will develop profiles of chemical species of the selected POPs and collate information on the height of major point sources.

2.8 FINE PARTICULATES

Description/objectives: Provide an evaluation of concentrations, transboundary fluxes and cost-effective abatement strategies. Develop a reliable emission inventory for primary particulate matter (PM). Evaluate experience with reporting and review guidance for emission estimation and monitoring of air concentrations. Support the investigations on fine particulates in preparation of the review of the Gothenburg Protocol.

Main activities and time schedule:

(a) MSC-W will evaluate the impact of aerosol dynamic processes in the calculations of particulate mass distribution over Europe with the unified Eulerian model. In cooperation with CIAM, it will determine the influence of such processes on source-receptor relationships for particulate mass (see item 2.3 (d) above). It will report on model intercomparisons with other European aerosol modelling groups;

(b) CCC will evaluate the status of monitoring and quality assurance activities, in particular with a view to providing monitoring data for model validation. It will continue work on source apportionment and chemical mass closure in cooperation with national experts. CCC will further improve the implementation of the PM monitoring strategy by advising Parties on setting up additional sites and applying new methodologies. It will finalize its elemental carbon/organic carbon (EC/OC) measurement campaign in summer 2003 and report the results to the Task Force on Measurement and Modelling thereafter. CCC will strengthen cooperation with other research projects for level 2 and 3 monitoring as defined in the PM monitoring programme;

(c) MSC-W will evaluate the emission data reported by Parties and analyse the consequences of the allocation of PM concentrations. CIAM will review the projections reported by Parties. MSC-W and CIAM will analyse the re-suspension of PM and natural emissions and report to the Task Force on Emission Inventories and Projections. MSC-W will take further steps to examine the contribution of VOC to secondary organic aerosols;

(d) CIAM, in collaboration with MSC-W, will further develop the framework for integrated assessment modelling of fine particulates, in particular to incorporate advances in atmospheric transport models. CIAM will report on the comments received by Parties in their review of their PM abatement cost curves available on the Internet. The centres will support the Task Force on the Health Aspects of Air Pollution by providing data allowing it to draw up recommendations on health indicators/ limit values for subsequent inclusion into integrated assessment modelling.

Table 1. The EMEP Emission Reporting Programme for 2002/2003

Emissions data should be submitted to the UNECE secretariat by 15 February 2003. Gridded data should reach the secretariat no later than 1 March 2003. This table is a summary of the reporting information contained in the Guidelines for Estimating and Reporting Emissions Data (EB.AIR/GE.1/2002/7).

Description of contents	Components	Reporting years ¹
YEARLY: MINIMUM (and ADDITIONAL)		
A. National totals:		
1. Main pollutants	SO _x , NO _x , NH ₃ , NMVOC, CO	From 1980 to 2001
2. Particulate matter	PM _{2.5} , PM ₁₀ , TSP	For 2000 and 2001
3. Heavy metals	Pb, Cd, Hg / (<i>As, Cr, Cu, Ni, Se, Zn</i>)	From 1990 to 2001
4. POPs	(See note 2)	From 1990 to 2001
B. Sector emissions:		
1. Main pollutants	SO _x , NO _x , NH ₃ , NMVOC, CO	From 1980 to 2001
2. Particulate matter	PM _{2.5} , PM ₁₀ , TSP	For 2000 and 2001
3. Heavy metals	Pb, Cd, Hg / (<i>As, Cr, Cu, Ni, Se, Zn</i>)	From 1990 to 2001
4. POPs	(See note 2)	From 1990 to 2001
5-YEARLY: MINIMUM REPORTING		
C. Gridded data in the EMEP 50x50 km² grid		
1. National totals	Main pollutants, PM, Pb, Cd, Hg, PAHs, HCB, dioxins/furans	From 1990 to 2001 (PM for 2000 and 2001)
2. Sector emissions	Main pollutants, PM, Pb, Cd, Hg, PAHs, HCB, dioxins/furans	For 2000 and 2001 (PM for 2000 and 2001)
D. Emissions from large point sources	Main pollutants, HM, PCDD/F, PAH, HCB, TSP	From 1990 to 2001 (TSP for 2000 and 2001)
E. Projected activity data and projected national total emissions		
1. National total emissions	See table IV 2A in EB.AIR/GE.1/2002/7	2010, 2015, 2020
2. Energy consumption	See tables IV 2B, 2C in EB.AIR/GE.1/2002/7	1990, 1995, 2000, 2010, 2015, 2020
3. Energy consumption for transport sector	See table IV 2D in EB.AIR/GE.1/2002/7	1990, 1995, 2000, 2010, 2015, 2020
4. Agricultural activity	See table IV 2E in EB.AIR/GE.1/2002/7	1990, 1995, 2000, 2010, 2015, 2020
5-YEARLY: ADDITIONAL REPORTING/FOR REVIEW AND ASSESSMENT PURPOSES		
VOC speciation / Height distribution / Temporal distribution	Parties are encouraged to review the information used for modelling at the Meteorological Synthesizing Centres available for review at http://www.emep.int/	
Land-use data / Mercury breakdown		
% of toxic congeners of PCDD/F emissions		
Pre-1990 emissions of PAHs, HCB, PCDD/F and PCB		
Information on natural emissions		

^{1/} As a minimum, data for the base year of the relevant protocol and from the year of entry into force of that protocol to the latest year should be reported.

^{2/} Aldrin, Chlordane, Chlordecone, DDT, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene (HCB), Mirex, Toxaphene, Hexachlorocyclohexane (HCH), Hexabromobiphenyl, Polychlorinated biphenyls (PCBs), Dioxins/Furans (PCDD/F), Polycyclic Aromatic Hydrocarbons (PAHs), and as additional information: Short-chained chlorinated paraffins (SCCP), Pentachlorophenol (PCP).

Table 2. EMEP measurement programme 2003

Measurements are to be reported by 1 October.

	Components	Notes	Minimum reporting	Measurement period	Measurement frequency
Gas	SO ₂		X	24 hours	daily
	NO ₂		X	24 hours	daily
	HNO ₃		Y	24 hours	daily
	NH ₃		Y	24 hours	daily
	O ₃		X	hourly means stored	continuously
	Light hydrocarbons C2-C7		Y	10-15 min.	twice a week
	Ketones and aldehydes		Y	8 hours	twice a week
	Hg		Y	24 hours	weekly
	Particles	SO ₄ ²⁻		X	24 hours
NO ₃ ⁻			Y	24 hours	daily
NH ₄ ⁺			Y	24 hours	daily
Na, Mg, Ca, K (Cl)		*	X	24 hours	daily
PM10		*	X	24 hours	daily
PMx (2.5 or 1.0)		**	Y	24 hours	daily
Mineral dust			Y	24 hours	daily
Elemental and organic carbon		*	X	24 hours	daily
Organic carbon speciation				weekly	weekly
Cd, Pb (priority); Cu, Zn, As, Cr, Ni (additional)			Y	24 hours	weekly
Chemical speciation as function of PM size			Y	24 hours	daily
Number size distribution				hourly means stored	continuously
Light scattering				hourly means stored	continuously
Gas & particles		HNO ₃ (g)+NO ₃ ⁻ (p),		X	24 hours
	NH ₃ (g)+NH ₄ ⁺ (p)		X	24 hours	daily
	POPs (PAH, PCB, HCB, chlordan, lindane, α-HCH, DDT/DDE)		Y	to be decided	to be decided
Precipitation	Amount, SO ₄ ²⁻ , NO ₃ ⁻ , Cl ⁻ , pH, NH ₄ ⁺ , Na ⁺ , Mg ₂ ⁺ , Ca ₂ ⁺ , K ⁺ , conductivity		X	24 hours/weekly	daily (weekly)
	Hg, Cd, Pb (priority), Cu, Zn, As, Cr, Ni (additional)		Y	weekly	weekly
	POPs (PAH, PCB, HCB, chlordan, lindane, α-HCH, DDT/DDE)		Y	to be decided	to be decided

Notes:

* The recommendation to measure PM10, elemental carbon, organic carbon and soluble base cations at all EMEP sites may not be feasible in the short run. However, measurements should be started at as many sites as possible and on at least one site in each country.

** As a European reference method for PM2.5 is not expected before 2004, countries are encouraged to start their measurements using other available methods.

X – At all sites.

Y – At a selection of sites only.