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

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Item 10 of the provisional agenda

DRAFT WORK-PLAN FOR THE IMPLEMENTATION OF THE CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION IN 2002

Note by the secretariat

1. In preparing the draft work-plan, the secretariat has taken into consideration the current work-plan (ECE/EB.AIR/71, annex IV), as well as the decisions taken by the Working Group on Strategies and Review at its thirty-third session (EB.AIR/WG.5/70), the Implementation Committee at its seventh and eighth meetings (EB.AIR/2001/3), the Working Group on Effects at its twentieth session (EB.AIR/WG.1/2001/2), and the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) at its twenty-fifth session (EB.AIR/GE.1/2001/2).

GE.01-32291

2002 WORK-PLAN FOR THE IMPLEMENTATION OF THE CONVENTION

1. STRATEGIES AND POLICIES

1.1 STRATEGIES AND REVIEW

Description/objective: Assessment of ongoing scientific and technical activities in view of the potential need to revise existing protocols or prepare new ones; negotiating revisions to protocols, including their annexes; promoting the exchange of technology; preparing proposals for any strategic developments under the Convention. The Working Group on Strategies and Review will assist the Executive Body in all policy-related issues.

Main activities and time schedules:

Taking into account the relevant activities under EMEP and the Working Group on Effects, as well as the initiatives of the European Community, and on the basis of information received from its expert groups, the Working Group on Strategies and Review will, in particular:

(a) Assess work in preparation of a review of the 1999 Gothenburg Protocol, including progress in reducing acidification, eutrophication and ground-level ozone and the pollutants responsible for these effects, including work carried out under items 1.4 (economic assessment) and 1.8 (ammonia abatement). It will also review progress in the work on particulate matter pollution, including work carried out under items 2.3 (integrated assessment modelling), 2.8 (fine particulates) and 3.8 (health effects). It will present a proposal for further action and required input for a review of the Protocol to the Executive Body;

(b) Assess work in preparation of a review of the Protocol on Heavy Metals, including information on the measures scheduled for re-evaluation in the Protocol. It will prepare a proposal for further action and required input for a review of the Protocol, including a possible effect-based approach as a basis for future action;

(c) Assess work in preparation of a review of the Protocol on Persistent Organic Pollutants (POPs), also taking into account progress under item 1.5 below, including information on the pollutants scheduled for re-evaluation in the Protocol and on pollutants that are candidates for future inclusion. It will prepare a proposal for further action and required input for a review of the Protocol;

(d) Review progress in the exchange of information and technology, including the work on techno-economic issues (see item 1.6 below), information received on product-related measures to reduce emissions of volatile organic compounds (VOCs), POPs and heavy metals and progress in work carried out under item 1.7 below;

(e) Continue negotiations, if requested to do so by the Executive Body, on an instrument to secure the long-term financing of core activities under the Convention not covered by the EMEP Protocol.

The thirty-fourth session of the Working Group on Strategies and Review will take place from 16 to 20 September 2002.

1.2 COMPLIANCE REVIEW

Description/objectives: Review of compliance by the Parties with their obligations under the Protocols to the Convention.

Main activities and time schedule: The Implementation Committee will evaluate the reporting by the Parties on their strategies and policies, including the reporting on technology-related obligations. It will carry out an in-depth review of compliance by the Parties with the 1994 Sulphur Protocol, including their national emission obligations. The Committee will continue its dialogue with appropriate bodies and experts. It will also continue consideration of compliance issues related to obligations in the Protocols that are not subject to specific reporting requirements, such as provisions dealing with research and monitoring. If a submission, referral or request for a report is made under paragraph 3 (b) or (d) of the Committee's functions, this will have to be dealt with as a priority and the Committee may have to adjust its work-plan and time schedule accordingly. The Committee will continue to review the progress made by the Parties in response to decisions taken by the Executive Body based upon the Committee's recommendations.

(a) Ninth meeting of the Implementation Committee in Geneva in April/May 2002;

(b) Tenth meeting of the Implementation Committee in Geneva in September 2002;

(c) Fifth report by the Implementation Committee to the Executive Body at its twentieth session.

1.3 REVIEWS OF STRATEGIES AND POLICIES FOR AIR POLLUTION ABATEMENT

Description/objectives: Overview of air pollution abatement in the UNECE region, giving a comprehensive description of national and international strategies and policies, including legislation in force and emission levels. Provide, together with emission data, a basis for the Implementation Committee to review compliance by Parties with their obligations under the protocols to the Convention. The reviews are carried out every two years.

Main activities and time schedule:

(a) An Executive Summary of the 2000 Review, based on replies to the 2000 Questionnaire (EB.AIR/2001/1) will be submitted to the Executive Body at its nineteenth session. Parties are invited to present corrections or modifications to the secretariat by 15 January 2002. The secretariat will then publish the Executive Summary;

(b) The next review is scheduled for 2002. The draft outline and draft questionnaire, for consideration by the Executive Body at its nineteenth session (EB.AIR/2001/2), will be circulated by the secretariat by 31 January 2002, with replies due by 31 March 2002. Replies will be made available to the Implementation Committee and posted on the Convention's web page.

The secretariat will prepare a draft review, based on the replies to the questionnaire and other information. It will aim at conveying information to the Parties, the public, the press and the scientific and research communities, in accordance with the recommendations of the expert group on communications.

1.4 ECONOMIC ASSESSMENT OF BENEFITS FROM AIR POLLUTION ABATEMENT AND ECONOMIC INSTRUMENTS

Description/objectives: To develop further the economic work on benefits and economic instruments undertaken by the former Task Force on Economic Aspects of Abatement Strategies and to enable economic considerations to be taken into account in the discussion/review of the protocols to the Convention. A second workshop will focus on the valuation of ecosystem benefits from air pollution abatement and build on the work of all relevant International Cooperative Programmes (ICPs) under the Working Group on Effects. Future workshops will cover the use of economic instruments to reduce transboundary air pollution and economic evaluation of damage to materials.

Main activities and time schedule: The Network of Experts on Benefits and Economic Instruments (NEBEI), led by the United Kingdom and with Mr. David Pearce as rapporteur, will provide the framework and expertise for a series of workshops. NEBEI will meet only on the occasion of planned workshops and include not only economists but also representatives from other specialist groups. It will collaborate closely with the Task Force on the Health Aspects of Air Pollution, the Working Group on Effects and the Task Force on Integrated Assessment Modelling.

The second workshop under NEBEI on the valuation of ecosystem benefits from air pollution abatement will be held in October 2002 in the Netherlands.

1.5 FURTHER ASSESSMENT OF PERSISTENT ORGANIC POLLUTANTS

Description/objectives: Review the evidence on specific POP compounds with a view to:

(a) Making the best use of available knowledge to meet the existing obligations for substances listed in annexes I, II and III to the Protocol on POPs; and

(b) Assisting Parties in identifying which candidates may be given priority for inclusion in the Protocol. The addition of new substances to annex I, II or III to the Protocol on POPs is regulated in Executive Body decision 1998/2 on procedures and information to be submitted to the Executive Body.

Main activities and time schedule:

(a) An ad hoc expert group co-led by Canada and the Netherlands will:

(i) Prepare a compendium of available information provided by experts relating to the existing obligations for substances listed in annexes I, II and III to the Protocol on POPs, together with an expert judgement on this material;

(ii) Review and assess data put forward, including preliminary risk profiles, for those POPs that may qualify to be included in the Protocol on POPs, and provide a compendium of substance information;

(b) The third meeting of the expert group will, if necessary, take place in early summer 2002, to prepare the report to the Working Group on Strategies and Review for presentation at its thirty-fourth session and to discuss the need for further work.

1.6 TECHNO-ECONOMIC ISSUES

Description/objectives: To further explore best available techniques (BAT) for emission abatement, their efficiency and cost; to develop techno-economic databases and methodologies for evaluating uncertainties and to draw up draft revisions of techno-economic issues in annexes to protocols, including those on POPs and heavy metals:

Main activities and time schedule:

(a) Establish an expert group on techno-economic issues, led by France, with a first meeting expected in the spring of 2002;

(b) Develop software describing emission control options, their costs and their range of uncertainties; validate and use the software in selected countries;

(c) Disseminate software to Parties for application; organize a workshop to promote the use of this tool.

1.7 EXCHANGE OF INFORMATION AND TECHNOLOGY

Description/objectives: To create favourable conditions for implementing technology-related obligations of the Convention and its protocols, to facilitate the implementation of existing protocols and the accession of non-Parties, particularly countries with economies in transition; to examine the needs for updating technical annexes and guiding documents to the protocols.

Main activities and time schedule:

(a) Convene a workshop on control technologies for emissions from stationary sources (5-7 December 2001, Warsaw) to review the methods used by Parties and identify techniques applied, including economic aspects and techno-economic databases;

(b) The secretariat will collect information from Parties and international institutions on control technologies and product management practices for pollutants covered by the protocols and collaborate with other international bodies, e.g. European Integrated Pollution Prevention and Control Bureau in Seville (Spain).

1.8 AMMONIA ABATEMENT

Description/Objectives: To promote the use of the draft framework code for good agricultural practice for reducing ammonia, prepared by the ad hoc expert group on ammonia abatement led by the United Kingdom, as a basis for Parties to draw up national codes and to better quantify relationships between recommended control options/techniques and resulting ammonia emission (EB.AIR/WG.5/2001/7); this work to be done in collaboration with EMEP.

Main activities and time schedule:

(a) Summary report of the second meeting of the ad hoc expert group (26-28 November 2001, Bologna, Italy) to the Working Group on Strategies and Review at its thirty-fourth session;

(b) Review the guidance document on ammonia abatement techniques (EB.AIR/1999/2);

(c) Further explore the non-agricultural ammonia emissions possibly underreported by Parties; develop work to improve the quality of reporting of ammonia emissions and measurements;

(d) Assist Parties, as needed, in developing and drawing up their own national advisory codes of agricultural practice to control emissions.

2. COOPERATIVE PROGRAMME FOR MONITORING AND EVALUATION OF THE LONG-RANGE TRANSMISSION OF AIR POLLUTANTS IN EUROPE (EMEP)

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 centres will cooperate with other organizations, programmes and projects, including the Arctic Monitoring and Assessment Programme (AMAP), the marine commissions, the United Nations Environment Programme (UNEP), the World Meteorological Organization (WMO) and its Global Atmospheric Watch (GAW) programme, the International Geosphere-Biosphere Programme (IGBP) and its International Global Atmospheric Chemistry (IGAC) activity, the EUREKA Project on the Transport and Chemical Transformation of Environmentally Relevant Trace Constituents in the Trophosphere over Europe: Second Phase (EUROTRAC-2), the European Commission's Clean Air for Europe (CAFE) programme and the European Environment Agency (including its Topic Centre for Air and Climate Change).

2.1 EMISSIONS

Description/objectives: Maintain the EMEP emission inventory, using data submitted by Parties, provide reliable information on emissions and emission projections, aid 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, will provide a technical forum and expert network to share information, harmonize emission factors, and discuss methodologies

and reporting. The secretariat will request the data in line with adopted guidelines. The Meteorological Synthesizing Centre-West (MSC-W) will support the compilation of data, including data quality assurance. It will update the inventory database and make it available. The Centre for Integrated Assessment Modelling (CIAM) will support work on projections. The Meteorological Synthesizing Centre-East (MSC-E) will provide support for heavy metal and persistent organic pollutant (POP) emission activities. The Chemical Coordinating Centre (CCC) will also contribute to this work.

Main activities and time schedule:

(a) The Task Force on Emission Inventories and Projections will finalize the emission reporting guidelines, based on comments received and on experience gained during the reporting on emission data for the year 2002, for consideration at the twenty-sixth session of the Steering Body, for approval by the Executive Body at its twentieth session, and for comprehensive reporting at the end of 2002. It will prepare a further extension of the Guidebook on heavy metals and particulate matter. It will work with Parties to improve the quality and completeness of emission reporting. The eleventh meeting of the Task Force and an associated European Environment Information and Observation Network (EIONET) workshop will take place in Spain on 6-8 May 2002;

(b) By 31 January 2002, as requested by the secretariat and in accordance with emission data guidelines, Parties will submit 2000 emission data and projections, at the requested sectoral, temporal and spatial distribution, for sulphur, NO_x, non-methane volatile organic compounds (NMVOCs), NH_3, particulate matter (PM), CO, heavy metals (priority metals: cadmium (Cd), mercury (Hg) and lead (Pb)) and selected POPs. A summary of required emissions data is given in the annex (table 1). Parties will ensure that data previously submitted are updated as necessary and that data are available for the protocol base years;

(c) MSC-W will extend the emission database to support the collection and management of new data provided under the emission reporting guidelines. It will also initiate work to set up a version of the emission database that is directly accessible via the Internet so that all data can be made available as soon as the internal consistency evaluation is completed. MSC-W will present a report on 1980-2000 emissions;

(d) The Task Force on Emission Inventories and Projections will intensify its work on the verification of emission data supported by MSC-W, in cooperation with the other EMEP centres, EEA and the secretariat.

2.2 ATMOSPHERIC MEASUREMENTS AND MODELLING

Description/objectives: Evaluate 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 EMEP Centres, supports the EMEP 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 EMEP 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. It will assist Parties in the application of tools to assess their data, contribute to the preparation of an assessment report and coordinate the input to it from national experts. The assessment report is scheduled for 2003, but much of the work will be done in 2002. The Task Force will hold its fourth meeting at WMO in Geneva on 20-22 March 2002;

(b) CCC, MSC-E and MSC-W will support the work for the assessment report. CCC will evaluate historical data according to quality objectives. In cooperation with MSC-E, it will prepare trends information for selected heavy metals and POPs from 1950 onwards and compare them to modelled and measured concentrations. It will give assistance to Parties to continue or resume reporting and to provide historical data. It will continue publishing monitoring site descriptions and relevant metadata on the Internet. CCC will assist national experts and the Task Force in identifying and quantifying trends observed across national boundaries. It will use links with other bodies with monitoring responsibilities to improve the geographical coverage of trend data. MSC-E and MSC-W will make updated modelled data available and will continue the recalculation of meteorological input data from 1990;

(c) The Parties will report monitoring results for 2001 to CCC by 1 December for data from January to June and by 1 June for data from July to December. A summary of required monitoring data is given in the annex (table 2). CCC will continue to collect monitoring data and evaluate and store them in the EMEP database. It will cooperate with EEA on the 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;

(d) 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;

(e) The Task Force on Measurements and Modelling will review the current measurement strategy. CCC, in cooperation with MSC-E and –W, will perform representativeness studies to provide input into this work. At selected sites, it will evaluate the regional representativeness and compare EMEP data with data from other monitoring networks. 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;

(f) The centres will publish all monitoring and modelling results together with related data on the EMEP web site once the EMEP Steering Body has derestricted them;

(g) The centres, in consultation with the Task Force, will study the possibility and resource requirements for extending work to the whole northern hemisphere.

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 global 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-seventh meeting in May 2002;

(b) CIAM, in collaboration with the Coordination Center for Effects, will pursue work on uncertainty analysis using error propagation. In addition, 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. The Task Force will hold a workshop at IIASA in Laxenburg (Austria) in January or February 2002, on uncertainty management in integrated assessment modelling;

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

(d) The Task Force will hold a workshop at CIAM at IIASA in Laxenburg in November 2002;

(e) CIAM, in consultation with the Task Force, will study the possibility and resource requirements for extending work to the whole northern hemisphere.

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). 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 Eulerian model. It will further work to implement a unified Eulerian model for acidification, eutrophication, ground-level ozone and particulates, based on the evaluation of boundary conditions, the inclusion of base cations in the model and the revision of dry deposition routines. It will further investigate the differences between the Lagrangian and the Eulerian model and report on progress at the twenty-sixth session of the Steering Body;

(b) CCC will arrange for laboratory comparisons of the main components in air and precipitation. Laboratories participating in other monitoring programmes under the Working Group on Effects will also be invited to participate where appropriate. CCC will start field comparisons for air and precipitation chemistry at two new sites (to be selected) and finalize and evaluate field comparisons for Slovenia, Netherlands and possibly Switzerland. It will also develop suggestions to improve nitrate aerosol monitoring;

(c) The Task Force on Measurement and Modelling will review the monitoring and modelling work of EMEP related to ammonia. CCC and MSC-W will provide a summary report to the Task Force on their work related to ammonia.

2.5 PHOTO-OXIDANTS

Description/Objectives: Provide monitoring and modelling data on concentrations and transboundary transport of ozone and VOCs. Evaluate short- and long-term exposures to photochemical oxidants. Analyse scenarios of ground-level ozone. 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 the growing periods, as well as the potential exposure of humans. Together with CCC, it will prepare a note for the Task Force on Measurements and Modelling on the height of ozone monitoring. It will apply the revised ozone level II dry deposition sub-routine. MSC-W and CIAM will collaborate with work under the Working Group on Effects to develop methods for damage analysis;

(b) MSC-W ozone modelling work will focus on the implementation of the unified Eulerian model. It will revise the radiation routines used in the calculation of photo-oxidant concentrations and evaluate the results of the inter-comparison of the photochemical schemes;

(c) CCC will increase its links with national and other existing monitoring networks to improve the regional coverage of ozone and VOC monitoring data, particularly in southern and eastern parts of Europe. CCC will also evaluate the selection of individual VOCs reported,including their accuracy, precision and representativeness. It will propose to the Task Force on Measurements and Modelling a list of selected VOC species with precision requirements for the future EMEP VOC measurement programme. In collaboration with MSC-W, CCC will evaluate the representativeness of the photo-oxidant monitoring stations using atmospheric transport models, local-scale models, monitoring data and available surface data. In cooperation with other ongoing research projects, they will perform trend analyses and comparisons with model results for some selected sites;

(d) CCC, in collaboration with participating laboratories, will prepare a procedure for regular campaigns with parallel sampling and analyses of VOC. Participating Parties will implement the programme at their sites;

(e) 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. A joint project by MSC-W, CIAM and the Environment Institute of the Joint Research Centre will address urban ozone pollution and its linkage to regional background pollution. A comparison of urban and regional dispersion will be conducted to explore the importance of local and regional emissions for urban air quality and assess the response of the various models towards changes in local and regional precursor emissions. A series of model intercomparison workshops will be conducted covering different urban models that apply the same emission data and meteorological assumptions. MSC-W will start the development of numerical methods to nest urban meso-scale models in the regional model.

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. Analyse trends in Pb and Cd deposition. Further develop emissions data. Support preparatory work for the review of the Protocol on Heavy Metals.

Main activities and time schedule:

(a) MSC-E will present to the EMEP Steering Body in 2002 information on: deposition and air concentrations fields for 2000 of Pb, Cd and Hg in Europe with a resolution of 50 km x 50 km as well as deposition to the regional seas; country-to-country deposition matrices for Pb and Cd; first results of calculations of Hg atmospheric transport on a hemispheric scale; calculation of heavy metal effect-related deposition maps using land cover data agreed upon under the Working Group on Effects; and results of comparisons between regional and hemispheric models;

(b) MSC-E will further develop its models by: a study of Hg exchange processes between the atmosphere and environmental compartments; improving model parameterizations (Pb, Cd, Hg dry deposition to different underlying surfaces, wet removal processes and mercury atmospheric chemistry); verification of modelling results (concentrations in air and precipitation,

deposition fluxes) against monitoring data; and model sensitivity studies with different sets of meteorological parameters;

(c) MSC-E will continue the Hg model intercomparison study. At stage II, concentrations in short-term episodes (1-2 weeks) will be calculated and compared with measurements obtained in a special campaign; at stage III the modelled annual and monthly mean concentrations will be compared with measured values at EMEP stations; and at stage IV export-import matrices for three countries (Italy, Poland, United Kingdom) will be compared;

(d) CCC will publish the guidelines for sampling and analysis of heavy metals and distribute them to the EMEP laboratories and continue collecting measured data. It will complement EMEP data with data from other international programmes. It will organize an intercomparison for sampling and analytical techniques for Hg and carry out an analytical intercomparison of the other seven heavy metals measured in precipitation;

(e) In cooperation with Parties, CCC will complete the setting-up of the superstation network (about ten monitoring sites in defined areas). Hg, Cd and Pb will be included as first priority elements. Second priority elements will be Cu, Zn, As, Cr and Ni. Heavy metals in precipitation will be collected weekly with wet-only samplers. Heavy metals in air will be collected weekly with high-volume samplers. Hg in precipitation will be collected monthly using bulk samplers, whilst one 24 h sample of Hg in air will be collected each week with gold traps;

(f) 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 physico-chemical processes of POPs in different environmental compartments, taking into account their transport within the EMEP region and on the hemispheric/global scale. Further develop POPs emission data. Support preparatory work for the review of the Protocol on POPs.

Main activities and time schedule:

(a) MSC-E will report to the EMEP Steering Body in 2002 on: an assessment of transboundary transport of Benzo[a]pyrene (BaP) (deposition and concentration fields and country-to-country matrix) for 2000; an evaluation of transport and accumulation of PCDD/Fs and HCB in various compartments; first results of the calculation of PCB regional and hemispheric transport (including to the Arctic) and estimation of its accumulation in different environmental compartments; an assessment of long-range transport of selected POPs to regional seas. It will support the ad hoc expert group on POPs and its national experts in their work on new substances 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 degradation rates in vegetation and litter in

view of vegetation types and climatic conditions; improving the gas/particulate partitioning description and the parameterization of aerosol deposition; refining the physico-chemical properties of PAHs, γ-HCH, PCDD/Fs and HCB; modifying the hemispheric version of the POP multi-compartment model for PCB and γ-HCH transport. It will initiate preparations for model intercomparisons;

(c) In cooperation with Parties, CCC will complete the setting-up of the superstation network (five sampling sites). As a first step, PAH, PCB, HCB, chlordane, lindane, á-HCH, DDT/DDE should be sampled, but this may require financial support to laboratories or a central laboratory to analyse samples. POPs in precipitation will be collected weekly. CCC will finalize the draft guidelines for sampling and analysis and present them to the Task Force on Measurements and Modelling. In cooperation with MSC-E, it will complement EMEP data with data from other international programmes for comparison with model results;

(d) CCC, MSC-E and the Task Force on Emission Inventories and Projections, in consultation with the 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;

(e) The Task Force on Measurements and Modelling will review the monitoring and modelling work of EMEP on POPs. CCC and MSC-E will provide a summary report to the Task Force on their work related to POPs.

2.8 FINE PARTICULATES

Description/objectives: Provide a first evaluation of particulate matter emissions, concentrations, transboundary fluxes and cost-effective abatement strategies. Evaluate experience with reporting and review guidance for emission reporting and monitoring of concentrations. Support the investigations on fine particulates under the review of the Gothenburg Protocol.

Main activities and time schedule:

(a) MSC-W will develop further the unified Eulerian model to include aerosol dynamics on the basis of the aerosol dynamic module MULTIMONO. It will carry out model inter-comparisons with other European aerosol modelling groups;

(b) MSC-W and CCC will evaluate the status of monitoring and quality assurance activities, in particular assessing the rural versus urban characteristics of PM in various parts of Europe. CCC will further improve the monitoring data by: supporting Parties to start monitoring or increase their number of sites; extending the database to accommodate the storage of PM data; determining the rural concentrations of elemental and organic carbon (EC and OC) for selected EMEP sites covering different regions of Europe. It will strengthen cooperation with other research projects for level 3 monitoring as defined in the PM monitoring programme and continue work on source apportionment and chemical mass closure in cooperation with the other centres and national experts. It will develop, in close collaboration with ongoing work of the European Community, guidance for the monitoring of smaller size fractions than PM10 (e.g. PM2.5);

(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. All centres will support work to improve the emissions database and support Parties' efforts using the results of the Coordinated European Emissions Inventory Project for Particles (CEPMEIP);

(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. CCC will support CIAM especially by evaluating emissions data. Parties will review their PM abatement cost-curves available on the Internet and present comments to CIAM, which will update its database. The centres will provide the Task Force on the Health Aspects of Air Pollution with data allowing it to draw up recommendations on health indicators/ limit values for subsequent inclusion into integrated assessment modelling.

3. EFFECTS OF MAJOR AIR POLLUTANTS ON HUMAN HEALTH AND THE ENVIRONMENT

3.1 REVIEW OF EFFECTS OF MAJOR AIR POLLUTANTS

3.1.1 Annual reports on progress in effects-oriented activities

Description/objectives: Annual review of activities and results of the International Cooperative Programmes and the Task Force on the Health Aspects of Air Pollution. Preparation of a draft annual joint report based on the information provided by the lead countries and the programme coordinating centres, for consideration by the Working Group on Effects.

Main activities and time schedule:

(a) Submission of relevant information on the International Cooperative Programmes and the Task Force on the Health Aspects of Air Pollution to the secretariat (17 May 2002);

(b) Submission of the 2002 joint report of the International Cooperative Programmes and the Task Force on the Health Aspects of Air Pollution prepared by the secretariat, to the Working Group on Effects in 2002.

3.1.2 Major review of effects of air pollutants

Description/objectives: Review of knowledge on the effects of selected air pollutants based on the results of the International Cooperative Programmes and the Task Force on the Health Aspects of Air Pollution as well as other relevant data and information. Preparations for the 2004 substantive review and assessment report present air pollution effects and their recorded trends.

Main activities and time schedule:

(a) Submission of draft outlines of possible contributions to the substantive report by the International Cooperative Programmes and the Task Force on the Health Aspects of Air

Pollution in January 2002 (in accordance with the outline approved by the Working Group on Effects at its twentieth session);

(b) Review of these draft outlines by the Extended Bureau of the Working Group on Effects at its meeting in February 2002;

(c) Preparation of the draft annotated outline of the 2004 substantive report by the Bureau of the Working group on Effects (March-May 2002);

(d) Draft annotated outline and timetable for the preparation of the 2004 substantive report to the Working Group on Effects in 2002.

3.2 INTERNATIONAL COOPERATIVE PROGRAMME ON EFFECTS OF AIR POLLUTION ON MATERIALS, INCLUDING HISTORIC AND CULTURAL MONUMENTS

Description/objectives: Quantification of the multi-pollutant effects on the corrosion of selected materials under different environmental conditions, inter alia, as a basis for the economic evaluation of air pollution damage. A Programme Task Force led by Sweden, in cooperation with the Programme's main research centre (Swedish Corrosion Institute, Stockholm), is responsible for the detailed planning and coordination of the Programme.

Main activities and time schedule:

(a) Preparations for the exposure of (i) passive samplers for particulate matter and nitric acid and (ii) material specimens in connection with the MULTI-ASSESS programme (to be started in autumn 2002);

(b) Preparations for the workshop on the release of heavy metals due to corrosion (to be held in spring 2003 in Germany);

(c) Report on the trend in corrosion attack in the network of the multi-pollutant exposure programme to the Working Group on Effects in 2002;

(d) Progress report on the further development of a database of environmental data for the multi-pollutant exposure programme to the Working Group on Effects in 2002;

(e) Draft technical report on (i) inventory of present methods and available data and (ii) proposed concerted action for assessing stock at risk of materials, including cultural monuments;

(f) Eighteenth meeting of the Programme Task Force, 13-15 May 2002, Kjeller, Norway.

3.3 INTERNATIONAL COOPERATIVE PROGRAMME ON ASSESSMENT AND MONITORING OF ACIDIFICATION OF RIVERS AND LAKES

Description/objectives: Identification of the state of surface water ecosystems and their long-term changes, with respect to the regional variation and impact of selected air pollutants, and including effects on biota. A Programme Task Force led by Norway, which also provides the Programme's centre (Norwegian Institute for Water Research, Oslo), is responsible for the detailed planning and coordination of the Programme.

Main activities and time schedule:

(a) Preparation of a draft of the fifteen-year report of ICP Waters for consideration by the Programme Task Force in 2002;

(b) Organization of the year 2002 biological and chemical intercalibrations; presentation of the 2001 results (including intercalibration on heavy metals) to the Working Group in 2002;

(c) Progress report on the further development of the monitoring network and Programme's database with emphasis on biological data to the Working Group in 2002;

(d) Workshop on heavy metals in surface waters and seventeenth meeting of the Programme Task Force, 18-21 March 2002, Lillehammer, Norway;

(e) Progress report on tracing recovery in watersheds; a multivariate approach;

(f) Eighteenth meeting of the Programme Task Force, October 2002, Moscow (tentatively).

3.4 INTERNATIONAL COOPERATIVE PROGRAMME ON ASSESSMENT AND MONITORING OF AIR POLLUTION EFFECTS ON FORESTS

Description/objectives: Collection and assessment of comprehensive and comparable data on changes in forests under actual environmental conditions (in particular air pollution, including acidifying and eutrophying deposition, as well as other stresses) and determination of cause-effect relationships. A Programme Task Force led by Germany, in cooperation with the Programme's main coordinating centre (Federal Research Centre for Forestry and Forest Products, Hamburg, Germany), is responsible for the detailed planning and coordination of the Programme. Intensive monitoring of forest ecosystems on the permanent sample plots (level II), extensive large-scale monitoring (level I) and integrated evaluation of results are carried out in cooperation with the European Commission.

Main activities and time schedule:

(a) Preparation of the 2002 executive and technical reports on Forest Condition in Europe (levels I and II); summary report on the 2001 monitoring results to the Working Group on Effects in 2002;

(b) Further elaboration of a cause-effect report based on the results of suitable plots of ICP Forests and ICP Integrated Monitoring; progress report to the Working Group in 2002;

(c) Preparation of a report on quality assurance for crown condition assessment; information to the Working Group in 2002;

(d) Progress report on the further development of links between level I and level II monitoring to the Working Group in 2002;

(e) Eighteenth meeting of the Programme Task Force, 18-22 May 2002, Lisbon.

3.5 INTERNATIONAL COOPERATIVE PROGRAMME ON EFFECTS OF AIR POLLUTION ON NATURAL VEGETATION AND CROPS

Description/objectives: Evaluation of the effects of air pollutants and other stresses on natural vegetation and crops; identification of dose/response functions for a range of crops; assessment of economic losses caused by ozone effects on crops; validation of ozone critical levels for natural vegetation and crops and further development of the level II approach; evaluation of natural vegetation and crops as effective indicators of the potential for damage to natural ecosystems by ozone, evaluation and mapping of heavy metal deposition to vegetation; and an evaluation of the impacts of nutrient nitrogen on semi-natural vegetation. A Programme Task Force, led by the United Kingdom, with the cooperation of the Programme's coordination centre (Centre for Ecology and Hydrology, Bangor Research Unit, Bangor, United Kingdom), is responsible for the detailed planning and coordination of the Programme.

Main activities and time schedule:

(a) The 2001/2002 annual report on the achievements of the Programme to the Working Group on Effects in 2002;

(b) Progress report on further development of the Programme's experiments on the effects of ambient ozone episodes on crops and natural vegetation to the Working Group in 2002;

(c) Progress report on determining the critical flux for effects of ozone on biomass, including preparations for the level II workshop (November 2002, Gothenburg, Sweden) to the Working Group in 2002;

(d) An assessment of economic losses caused by ozone effects on agricultural production, including predictions for 2010;

(e) Progress report on studies into the impacts of nutrient nitrogen on semi-natural vegetation;

(f) Progress report on monitoring heavy metals deposition to crops and natural vegetation, including an update and analysis of data from the Europe-wide heavy metals in mosses survey;

(g) Fifteenth meeting of the Programme Task Force, 11-14 February 2002, Trier, Germany.

3.6 INTERNATIONAL COOPERATIVE PROGRAMME ON INTEGRATED MONITORING OF AIR POLLUTION EFFECTS ON ECOSYSTEMS

Description/objectives: Determination and prediction of the state of ecosystems and their long-term changes with respect to the regional variation and impact of selected air pollutants, with special attention to effects on biota. A Programme Task Force led by Sweden is responsible for planning, coordinating and evaluating the Programme. The Programme's centre (Finnish Environment Institute, Helsinki) is entrusted with collecting, storing, processing and analysing data from countries taking part in the Programme.

Main activities and time schedule:

(a) Preparation of the Eleventh Annual Report of ICP Integrated Monitoring; presentation to the Working Group on Effects in 2002;

(b) Continued calculation of: (i) sulphur and nitrogen compounds, base cations, organic carbon and H^+ budgets and trends; and (ii) heavy metal pools and fluxes; report to the Working Group in 2002;

(c) Further development of bioeffects indication, assessment of multi-pollutant, multi-effect relationships (in cooperation with ICP Forests); progress report to the Working Group in 2002;

(d) Progress report on the results of site-specific dynamic modelling and assessment of the recovery at selected ICP Integrated Monitoring sites, to the Working Group in 2002;

(e) Consideration of possibilities for closer cooperation with and/or more active participation in activities of other relevant international organizations/bodies, in addressing global environmental issues (e.g. climate change); information to the Working Group in 2002;

(f) Tenth meeting of the Programme Task Force, and training workshop on dynamic modelling, 24-27 April 2002, Prague.

3.7 INTERNATIONAL COOPERATIVE PROGRAMME ON MAPPING CRITICAL LEVELS AND LOADS

Description/objectives: Determination of critical loads and levels and their exceedances for selected pollutants, development and application of other methods for effect-based approaches, and modelling and mapping of the present status and trends in impacts of air pollution. A Programme Task Force led by Germany is responsible for the detailed planning and coordination of activities. The Task Force uses and integrates available and accepted data, drawing, in particular, on the current work of other task forces, International Cooperative Programmes and EMEP. The Coordination Center for Effects (CCE at the National Institute of Public Health and the Environment, Bilthoven, Netherlands) provides scientific and technical support to the Task Force

and to other effect-related activities, in particular by developing methods and models for calculating critical loads and levels and for applying other effect-based approaches, as well as by producing maps of critical loads and levels and their exceedances, and other risk parameters related to potential damage and recovery.

Main activities and time schedule:

(a) Continuing maintenance and updating of the database of critical loads of sulphur and nitrogen, as well as data derived from them; information to the Working Group on Effects in 2002;

(b) Preparation and circulation of the summary report on conclusions and recommendations of the second meeting of the Joint Group of Experts on Dynamic Modelling (November 2001, Ystad, Sweden);

(c) Further development of methods and procedures for dynamic modelling on a European scale, including preparation and application of a draft dynamic modelling manual and provision of training to NFCs, progress report to the Working Group in 2002;

(d) Further development of critical limits for heavy metals, testing and validation of critical load and stand-still calculation tools for heavy metals in national mapping activities, including comparison of their results; report on the results of testing methodologies for Pb and Cd with data provided by NFCs on a voluntary basis to the Working Group in 2002;

(e) Twelfth CCE workshop on modelling and mapping and eighteenth meeting of the programme Task Force, 15-19 April 2002, Sorrento, Italy.

3.8 EFFECTS OF AIR POLLUTANTS ON HUMAN HEALTH

Description/objectives: Preparation of state-of-the-art reports on the direct and indirect effects of long-range transboundary air pollution on human health.

(a) The World Health Organization (WHO) is invited to present relevant progress/technical reports to the Working Group on Effects, so that acquired knowledge of WHO can be applied in the further implementation of the Convention. Additional information/reports should be provided, when appropriate, by other international organizations, interested Governments, and/or other subsidiary bodies under the Convention;

(b) To support the Working Group on Effects and the Executive Body in preparing/substantiating new and/or updating existing protocols, the joint Task Force of WHO/European Centre for Environment and Health (ECEH) and the Executive Body, led by WHO/ECEH, Bonn Office, evaluates and assesses the health effects of long-range transboundary air pollution and reports on the subject.

Main activities and time schedule:

(a) Report on a preliminary assessment of the health risk of selected heavy metals from long-range transboundary air pollution to the Working Group on Effects in 2002;

(b) Continuation of the assessment of population exposure to particulates from long-range transport and of its health effects; information to the Working Group in 2002;

(c) Preliminary assessment of the potential health effects of the selected "higher priority" POPs; report to the Working Group in 2002;

(d) Fifth meeting of the Task Force on the Health Aspects of Air Pollution, May 2002, Bonn, Germany (tentatively).

Annex

Table 1. The EMEP Emission Reporting Programme for 2001/2002 [1]

Emissions data should be submitted to the UNECE secretariat by 31 January 2002.
This table is based on information in the draft guidelines for estimating and reporting emissions data (EB.AIR/GE.1/2001/6 and Add.1), adopted in principle by the EMEP Steering Body. Parties may continue to report emissions according to the previous guidelines (EB.AIR/GE.1/1997/5).

Description of contents	Components	Reporting years [2]
YEARLY: MINIMUM **(**and *ADDITIONAL)*		
A. National totals:		
1. Main pollutants	SO_x, NO_x, NH_3, NMVOC, CO	From 1980 to 2000 [3]
2. Particulate matter	$PM_{2.5}$, PM_{10}, TSP	For 2000
3. Heavy metals	Pb, Cd, Hg / (*As, Cr, Cu, Ni, Se, Zn)*	From 1990 to 2000
4. POPs	(See note 4)	From 1990 to 2000
B. Sector emissions:		
1. Main pollutants	SO_x, NO_x, NH_3, NMVOC, CO	From 1980 to 2000 [3]
2. Particulate matter	$PM_{2.5}$, PM_{10}, TSP	For 2000
3. Heavy metals	Pb, Cd, Hg / (*As, Cr, Cu, Ni, Se, Zn)*	From 1990 to 2000
4. POPs	(See note 4)	From 1990 to 2000
5-YEARLY: MINIMUM REPORTING		
C. Gridded data in the EMEP 50x50 km^2 grid		
1. National totals	Main pollutants, PM, Pb, Cd, Hg, PAHs, HCB, dioxins/furans	From 1990 to 2000 (PM for 2000)
2. Sector emissions	Main pollutants, PM, Pb, Cd, Hg, PAHs, HCB, dioxins/furans	From 2000 to 2000 (PM for 2000)
D. Emissions for large point sources	Main pollutants, PM, Pb, Cd, Hg, PAHs, HCB, dioxins/furans	From 1990 to 2000 (PM for 2000)
E. Projection data		
1. Energy consumption	See table 3A in EB.AIR/GE.1/2001/6 Add.1	1990, 1995, 2000, 2010, 2020
2. Energy consumption for transport sector	See table 3B in EB.AIR/GE.1/2001/6 Add.1	1990, 1995, 2000, 2010, 2020
3. Agricultural activity	See table 3C in EB.AIR/GE.1/2001/6 Add.1	1990, 1995, 2000, 2010, 2020
5-YEARLY: ADDITIONAL REPORTING/REVIEW		
VOC speciation		Parties are encouraged to review the information used for modelling at the Meteorological Synthesizing Centres. The information will be available for review at http://www.emep.int/
Height distribution		
Temporal distribution		
Land-use data		
Mercury breakdown		
% of toxic congeners of PCDD/F		
Pre-1990 emissions of PAHs, HCB, PCDD/F and PCB		

1) For details, refer to the Draft guidelines for estimating and reporting emissions data (EB.AIR/GE.1/2001/6 and Add.1).
2) 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.
3) Projected emissions of SO_x, NO_x, NH_3, and NMVOCs should be reported for the years 2010 and 2020.
4) Aldrin, Chlordane, Chlordecone, Dieldrin, Endrin, Heptachlor, Hexaromobiphenyl, Mirex, Toxapene, HCH, DDT, PCBs, Dioxins and Furans, PAHs, HCBs / (PCP, SCCP).

Table 2. EMEP measurement programme 2002

Measurements are to be reported by 1 December for data from January to June and by 1 June for data from July to December.

	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 weekly
	Ketones and aldehydes		Y	8 hours	twice weekly
	Hg		Y	24 hours	weekly
Particles	SO_4^{2-}		X	24 hours	daily
	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
	EC and OC	*	X	24 hours	daily
	OC speciation			weekly	weekly
	Cd, Pb (first priority); Cu, Zn, As, Cr, Ni (second priority)		Y	24 hours	once 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	daily
	$NH_3(g)+NH_4^+(p)$		X	24 hours	daily
	POPs (PAH, PCB, HCB, chlordane, lindane, a-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 (first priority), Cu, Zn, As, Cr, Ni (second priority)		Y	weekly	weekly
	POPs (PAH, PCB, HCB, chlordane, lindane, α-HCH, DDT/DDE)		Y	to be decided	to be decided

Notes:
* The recommendation to measure PM10, EC/OC 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.