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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 for Air Pollutants in Europe (EMEP)
(Twenty-eighth session, Geneva, 6-8 September 2004)
Item 6 of the provisional agenda

DRAFT WORK-PLAN FOR 2005

Note prepared by the secretariat in consultation with the Bureau

1. 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.

2. 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 East Asian Acid Deposition Network (EANET), the European Commission's Clean Air for

Europe (CAFE) programme, the European Environment Agency (EEA) (including its European Topic Centre for Air and Climate Change (ETC/ACC)), the International Geosphere-Biosphere Programme (IGBP) and its International Global Atmospheric Chemistry (IGAC) activity, the marine commissions, the United Nations Environment Programme (UNEP), the World Meteorological Organization (WMO), including its Global Atmosphere Watch (GAW) programme, and the European Centre for Medium-range Weather Forecasts (ECMWF).

2.1 EMISSIONS

Description/objectives: Further develop the EMEP emission inventory, based on data submitted by Parties, improve the quality, transparency, consistency, completeness and comparability of reported emission and projection data, support the review of compliance, and assist Parties to fulfil their reporting tasks. The Task Force on Emission Inventories and Projections, with assistance from the centres and in cooperation with the European Environment Information and Observation Network (EIONET), 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. The Task Force will continue cooperation with the European Pollutant Emissions Register (EPER), the United Nations Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change on the harmonization of reporting requirements.

Main activities and time schedule:

(a) The Task Force will work with Parties to improve the quality, consistency and completeness of emission reporting with a focus on validation and implementation of good practice, and cooperate with EMEP centres, EEA and the Joint Research Centre (JRC) to facilitate and ensure implementation of the inventory improvement programme. It will continue to develop and promote the Atmospheric Emission Inventory Guidebook, in close collaboration with EEA and JRC. It will hold its thirteenth meeting jointly with EIONET on 19-20 October 2004 in Italy, its fourteenth meeting in spring 2005, with an emphasis on data quality and inventory review, and its fifteenth meeting jointly with EIONET in autumn 2005. MSC-W, together with the ETC/ACC and CIAM, will support the Task Force's work on emission data review;

(b) The Task Force will give particular focus to the review of reported emissions of heavy metals and persistent organic pollutants (POPs) to identify appropriate actions to improve the inventory. In cooperation with CIAM, CCC, EEA and JRC, it will promote improvements in estimating and reporting emissions of particulate matter. As part of the inventory improvement programme it will initiate discussions on methods and resource requirements for in-depth reviews of inventories;

(c) By 15 February 2005, or 1 March 2005 for gridded data, as requested by the secretariat and in accordance with the Emission Reporting Guidelines (Air Pollution Studies series, No. 15, 2004), Parties should submit 2003 emission data and projections and updates to data for earlier years as summarized in the table below;

(d) MSC-W will compile reported emission data, review data consistency, update the inventory database and make the emission database available at http://webdab.emep.int. It will evaluate and carry out quality control of data on large point sources from different origins and other indicators to ensure the quality of gridded sector emissions. CIAM will support work on projections. MSC-E and CCC will support work on heavy metal and POP emission data. CCC will support work on particulate matter emission data.

2.2 ATMOSPHERIC MEASUREMENTS AND MODELLING

Description/objectives: Assess the results of implementing the protocols to the Convention, provide the measurement and modelling tools necessary for further international air pollution abatement policies, including the review of protocols, and ensure support for the compilation and evaluation of information on transboundary air pollution. The Task Force on Measurements and Modelling, led by the United Kingdom 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 Parties will report to CCC monitoring results for 2004 by 1 October 2005 in accordance with the adopted monitoring strategy (EB.AIR/GE.1/2004/5). CCC will: continue to store the monitoring data in the EMEP database; make the data available via the Internet once checked; evaluate the data and report thereon to the Task Force with a specific focus on policy-relevant aspects; inform the Task Force of progress in further harmonizing reporting between EMEP and other international organizations;

(b) CCC, in consultation with the Task Force, will continue work to improve the EMEP Manual for Sampling and Chemical Analysis; update the quality assessment (QA) / quality control (QC) part of the Manual and expand the QA information available through the Internet;

(c) The Task Force, supported by CCC, will assist Parties to implement the adopted monitoring strategy, taking into account the findings of the workshop on the implementation of the strategy, hosted by the Norwegian Institute for Air Research (NILU) in autumn 2004. CCC, in cooperation with MSC-E and MSC-W, will continue to examine approaches to combine modelling data with observations. CCC will collaborate with other national and international programmes to implement the 'level' approach of the monitoring strategy. It will provide training and guidance to Parties to establish level 2 and level 3 monitoring sites. Parties, supported by CCC, will continue their efforts to improve the EMEP network in the Mediterranean region and in Central and Eastern Europe. The Task Force will hold its sixth meeting in spring 2005 and report on progress to the Steering Body at its twenty-ninth session;

(d) The Task Force will, in close collaboration with experts from Parties and the EMEP centres, prepare for the evaluation of the MSC-East modelling of heavy metals and POPs. MSC-E will host a workshop on the review in autumn 2005;

(e) The Task Force, in collaboration with interested Parties and the centres, will continue to assist MSC-W in the further development of the unified Eulerian model with respect to particulate matter, taking into account the recommendations of the review meeting which took place on 3-5 November 2003 in Oslo (EB.AIR/GE.1/2004/6);

(f) The centres, in consultation with the Task Force, will collaborate with monitoring networks outside the EMEP area to link regional and hemispheric measurements and work on extending the modelling work to cover the whole Northern hemisphere. They will also explore possible interaction between the work of EMEP and new initiatives such as Global Monitoring for Environment and Security (GMES);

(g) MSC-W will explore the possibilities for increasing the spatial resolution of the unified Eulerian model;

(h) The centres, in consultation with the Task Force and in cooperation with EEA and JRC, will further assess the links between regional pollution and urban and local pollution, in particular for PM and ozone, and will report their findings to the EMEP Steering Body.

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 and the links between regional air pollution and climate change. Modelling will cover: (i) abatement options for reducing sulphur, nitrogen oxides, ammonia, volatile organic compounds (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 the baseline scenarios for the review of the Gothenburg Protocol. It will encourage and support national modelling activities carried out by National Focal Points for Integrated Assessment Modelling and promote the sharing of data, and experience with integrated assessment modelling, outside the EMEP region. The Task Force will hold a workshop on progress of the RAINS model in January 2005 at IIASA in Laxenburg (Austria). It will hold its thirtieth meeting in May 2005;

(b) CIAM will pursue work on the baseline scenarios covering all Parties in the EMEP region, including an assessment of uncertainties. Work done in collaboration with MSC-W will focus on uncertainties in atmospheric transport models and related non-linearities in the source-receptor relationships and the inter-annual variability of source-receptor relationships;

(c) CIAM will continue to develop methods for including the results of dynamic modelling in integrated assessment modelling, in cooperation with the Coordination Centre for Effects (CCE), and methods to identify the systematic differences in response to emission changes between regional and urban-scale models in integrated assessment models, in cooperation with MSC-W. It will investigate abatement measures to address urban pollution and report to the Task Force;

(d) The Chairman of the Task Force, in cooperation with CIAM, will explore possibilities for the development of emission projections for certain POPs and heavy metals that can be used in assessing trends in deposition;

(e) CIAM, in cooperation with MSC-W, will use the set of emission projections prepared for the whole Northern hemisphere to examine the effects of hemispheric background pollution on source-receptor relationships in Europe. It will evaluate the cost-effectiveness of measures to reduce regional air pollutants taking into account their impacts on climate change. CIAM will also prepare for an evaluation of sectoral trends and discussion of scenarios of

maximum feasible emission reductions taking into account the potential of non-technical measures and new emerging technologies.

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. Refine and complete emission data with specific focus on the spatial distribution. Support the preparations for the review of the Gothenburg Protocol.

Main activities and time schedule (see also items 2.1-2.3 above):

(a) MSC-W will calculate the transport of sulphur and nitrogen compounds for 2003. It will revise trends in sulphur and nitrogen air concentrations since 1980 and will further study the influence of co-deposition of ammonia and sulphur dioxide. Together with the other centres, it will present a status report (also covering photo-oxidants) to the Steering Body at its twenty-ninth session;

(b) CCC will arrange for laboratory comparisons of the main components in air and precipitation and continue field comparisons for air chemistry for two or three sites and finalize and evaluate field comparisons for two 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 will check the model performance with respect to oxidized and reduced nitrogen and will re-examined emissions data with respect to changes in emission patterns (geographical distribution and emission heights). It will also explore possibilities for sub-grid scale modelling of deposition to ecosystems;

(d) MSC-W and CCC, in cooperation with the International Cooperative Programme (ICP) Integrated Monitoring, ICP Modelling and Mapping and ICP Forests, will validate the modelled calculation of total base cation deposition available in December 2004 and evaluate the effects of base cation deposition fields in critical loads calculations.

2.5 PHOTO-OXIDANTS

Description/objectives: Provide monitoring and modelling data on concentrations and transboundary transport of ozone, NOx and VOCs. Evaluate short- and long-term exposures to photochemical oxidants. Refine and complete emission data with specific focus on the spatial distribution. 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 (see also items 2.1-2.3 above):

(a) MSC-W will calculate the short- and long-term exposures of vegetation to photochemical oxidants for vegetation growing periods, as well as the rural contribution of ozone levels relevant for human exposure. It will apply the revised ozone level II dry deposition sub-routine and, in cooperation with CIAM, develop methods to evaluate exceedances of critical levels;

(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. It will evaluate the QA/QC procedures and prepare a proposal on parameters to be measured as part of the adopted monitoring strategy. In collaboration with participating laboratories, it will arrange for campaigns with parallel sampling and analyses of VOCs. CCC and MSC-W, as well as other national and international modelling teams, will report on measurements and modelling of VOCs for discussion by the Task Force on Measurements and Modelling at its sixth meeting and will interact with the VOC monitoring activities being established in EU and in other initiatives;

(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 and will develop methods to account for the systematic differences in response to emission changes between regional and urban-scale models in integrated assessment models;

(d) The centres will cooperate on extending the modelling work to cover the whole Northern hemisphere. MSC-W will compile the meteorological data for hemispheric modelling and present hemispheric model simulations focusing on the analysis of the influence from the free troposphere on ozone levels in Europe. MSC-E and MSC-W will collaborate with CCE on the extension of land use information to the Northern hemisphere. CCC will develop a strategy to derive three-dimensional fields of priority substances on the basis of surface and satellite observations, remote sensing and other sensors.

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 a preliminary data set for other metals. Support preparatory work for the review of the Protocol on

Heavy Metals, in particular the work of the Expert Group on Heavy Metals.

Main activities and time schedule (see also items 2.1-2.3 above):

(a) MSC-E will prepare information for 2003 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 compare model results for concentrations in air and precipitation and deposition fluxes with measurements, and study model sensitivity and uncertainty. It will carry out trend analysis of Pb, Cd and Hg pollution (1990-2003) including long-term changes in total deposition to countries and air concentration and deposition fluxes at selected monitoring stations. It will present calculations for Hg dispersion at the hemispheric scale for evaluation of European pollution from global sources and boundary conditions for the regional EMEP modelling;

(b) MSC-E will prepare a detailed description of its model and study the model sensitivity and uncertainties. In close collaboration with CCC and experts from Parties, MCS-E will prepare an extensive evaluation of model performance against long-term measurements, for the model review;

(c) MSC-E will further develop its models and its input databases. It will work on meteorological data and, together with CCC, on the preparation of gridded anthropogenic emission data for regional modelling, based on official emissions and expert estimates, compilation of available data of natural emissions, and measurement data;

(d) Together with MSC-E, CCC will complement EMEP data with data from other international programmes and will carry out a comprehensive comparison of observations with modelling results. CCC will report on the intercomparison for sampling and analytical techniques for seven heavy metals measured in precipitation and it will evaluate the quality of the heavy metals data. CCC, in cooperation with Germany, will organize a field intercomparison of Hg in precipitation.

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. Develop reliable emission data for the POPs listed in the Protocol, as well as a preliminary data set for other substances. Support preparatory work for the review of the Protocol on POPs, and in particular the Task Force on POPs.

Main activities and time schedule (see also items 2.1-2.3 above):

(a) MSC-E will prepare information for 2002 on: evaluation of PAHs (benzo[a]pyrene (BaP), benzo[b]fluoranthene (BbF), benzo[k]fluoranthene (BkF) and indeno[1,2,3-cd]pyrene and PCDD/Fs concentration and deposition fields; evaluation of transboundary transport of BaP in 2002 and pilot assessment of source-receptor relationships for all toxic congeners of PCDD/Fs (country-to-country matrices); trend analysis of environmental contamination by four indicator PAHs and PCDD/Fs in the EMEP domain (1990-2002); and an assessment of the hemispheric pollution by PCBs and HCB. It will analyse contributions from emission sources of the Northern hemisphere to the contamination of the European region in 2000 and the contribution from European sources to the contamination of different regions;

(b) For the model review, MSC-E will evaluate uncertainties in modelling, measurement and emission data, in cooperation with CCC and the Task Force on Emission Inventories and Projections;

(c) MSC-E will further develop its models with respect to: the redistribution between different phases and sedimentation in the marine environment; the gas/aerosol partitioning process in the atmosphere; and the distribution in the atmosphere taking into account spatial and temporal variations of OH radical concentrations. It will complete the second stage of the model intercomparisons and prepare the third stage;

(d) In cooperation with MSC-E, CCC will complement EMEP monitoring data with data from other international and national programmes. It will evaluate data quality and data representativity, and, in cooperation with MSC-E, will compare the observations with model estimates. Both centres will cooperate with UNEP to harmonize the global POPs monitoring strategy with the EMEP strategy;

(e) CCC and MSC-E, in consultation with the Task Force on Emission Inventories and Projections and with Parties, will improve the POPs emission data quality with specific emphasis on PAHs, PCDD/Fs, PCBs and HCB. 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. It will perform screening studies for new substances.

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 (see also items 2.1-2.3 above):

(a) MSC-W will investigate further the chemical composition of particulate matter in Europe and, in cooperation with CCC, analyse the contribution of organic aerosol to total particulate mass, carry out sensitivity tests on the influence of different assumptions on the chemical composition of emission data, and study the effect of wind-blown PM sources and natural dust in total particulate matter mass. It will further study methods to include effects of re-suspension in urban areas in regional simulations. MSC-W will continue the evaluation of the research aerosol model and report to the Task Force on Measurements and Modelling on the comparison of the model results against observations. MSC-W, in collaboration with CCC, CIAM and the Task Force on Emissions Inventories and Projections, will further investigate size distribution and chemical composition of PM emissions;

(b) CCC will evaluate the status of monitoring and quality assurance activities, in particular with a view to providing input 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 follow up the output from the elemental carbon/organic carbon (EC/OC) measurement campaign and further evaluate the sampling and analytical methods used in order to improve these. CCC will strengthen cooperation with other research projects for level 2 and level 3 monitoring as defined in the PM monitoring programme, including the application of vertical resolved data and optical parameters for model validation;

(c) 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. The centres will prepare integrated assessment modelling scenarios using agreed health indicators. The centres will present a status report to the Steering Body at its twenty-ninth session.

Table. The EMEP Emission Reporting Programme for 2004/2005

Emission data should be submitted to the secretariat by 15 February 2005. Gridded data should reach the secretariat no later than 1 March 2005. This table is a summary of the reporting information contained in the Emission Reporting Guidelines (Air Pollution Studies Series, No. 15, 2004).

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 2003
2. Particulate matter	$PM_{2.5}$, PM_{10}, TSP	From 2000 to 2003
3. Heavy metals	Pb, Cd, Hg / (*As*, *Cr*, *Cu*, *Ni*, *Se*, *Zn*)	From 1990 to 2003
4. POPs	(See note 2)	From 1990 to 2003
B. Sector emissions:		
1. Main pollutants	SO_x, NO_x, NH_3, NMVOC, CO	From 1980 to 2003
2. Particulate matter	$PM_{2.5}$, PM_{10}, TSP	From 2000 to 2003
3. Heavy metals	Pb, Cd, Hg / (*As*, *Cr*, *Cu*, *Ni*, *Se*, *Zn*)	From 1990 to 2003
4. POPs	(See note 2)	From 1990 to 2003
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	For 1990, 1995 and 2000 (PM for 2000)
2. Sector emissions	Main pollutants, PM, Pb, Cd, Hg, PAHs, HCB, dioxins/furans	For 1990, 1995 and 2000 (PM for 2000)
D. Emissions from large point sources	Main pollutants, HM, PCDD/F, PAH, HCB, PM	For 2000
E. Historical and projected activity data and projected national total emissions		
1. National total emissions	See table IV 2A in the Emission Reporting Guidelines	For 2010, 2015 and 2020
2. Energy consumption	See tables IV 2B, 2C in the Emission Reporting Guidelines	For 1990, 1995, 2000, 2010, 2015 and 2020
3. Energy consumption for transport sector	See table IV 2D in the Emission Reporting Guidelines	For 1990, 1995, 2000, 2010, 2015 and 2020
4. Agricultural activity	See table IV 2E in the Emission Reporting Guidelines	For 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://webdab.emep.int/ and http://www.emep.int/index_data.html
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-chain chlorinated paraffins (SCCP), pentachlorophenol (PCP). (See Emission Reporting Guidelines).