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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-seventh session, Geneva, 8-10 September 2003)
Item 4 (e) of the provisional agenda

MEASUREMENTS AND MODELLING

Progress report prepared by the Co-Chairs of Task Force
in collaboration with the secretariat

Introduction

1. This report presents progress in atmospheric measurements and modelling, including the results of the fourth meeting of the Task Force on Measurements and Modelling, held in Valencia (Spain) on 9-11 April 2003. The Task Force discussed, in particular, the draft EMEP monitoring strategy, the progress in the work on the assessment report, the review of the new unified Eulerian model and recent heavy metals and persistent organic pollutants (POPs) model developments.

2. The presentations made at the fourth meeting of the Task Force are available on the Internet at http://www.nilu.no/projects/ccc/tfmm/.

3. Experts from the following Parties to the Convention participated: Austria, Belarus, Croatia, the Czech Republic, Denmark, Estonia, France, Germany, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, the Republic of Moldova, Romania, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia and the United Kingdom.

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4. Furthermore, representatives from the four EMEP Centres, the Centre for Integrated Assessment Modelling (CIAM), the Chemical Coordinating Centre (CCC), the Meteorological Synthesizing Centre East (MSC-E) and the Meteorological Synthesizing Centre West (MSC-W), as well as representatives of the World Meteorological Organization (WMO), the European Topic Centre for Air and Climate Change (ETC/ACC), the European Community's Joint Research Centre (JRC) and the Oil Companies' European Organization for Environment, Health and Safety (CONCAWE), and the UNECE secretariat attended.

5. Ms. Liisa Jalkanen (WMO) and Mr. Dick Derwent (United Kingdom) co-chaired the meeting.

6. The meeting was hosted by the Mediterranean Centre for Environmental Studies Foundation (CEAM). The Task Force was invited to visit the Euphore facilities of CEAM in the Technology Park of Valencia. The Task Force expressed its great appreciation to Mr. M. Millán of CEAM for the warm hospitality.

I. EMEP MONITORING STRATEGY AND MEASUREMENT PROGRAMME 2004-2009

7. At its twenty-sixth session, the EMEP Steering Body had requested the Task Force to draw up a draft strategy based on the input by CCC for consideration by the Steering Body at its twenty-seventh session (EB.AIR/GE.1/2002/2, para. 62 (e)). At its third meeting, the Task Force had discussed a first outline for a new monitoring strategy.

8. Mr. Kjetil Torseth (CCC) presented an overview of the draft background report, a preliminary draft of which had been made available before the meeting on the Internet. He highlighted the main issues for discussion.

9. The Task Force discussed the draft report in three discussion groups that focused on each of the areas of work: (i) Acidification, eutrophication, and particulate matter (PM); (ii) photo-oxidants; and (iii) heavy metals and POPs. CCC agreed to revise the draft report on the basis of the comments received and to include the proposals made by the discussion groups. Experts were invited to provide further specific comments to CCC by 1 May 2003.

10. The Task Force agreed that a concise document with the draft strategy based on the report should be prepared. This document should provide a complete description of the monitoring strategy, as agreed upon by the Task Force, clearly spelling out the requirements for Parties. It would summarize the main justifications for the approach. The draft strategy is presented to the EMEP Steering Body for adoption in document EB.AIR/GE.1/2003/3/Add.1.

11. The Task Force also discussed whether the EMEP monitoring work should be extended to also cover greenhouse gases. It recognized that this might be relevant for further work on

hemispheric air pollution, but noted that, in view of the resource constraints, priority must be given to pollutants covered by the protocols to the Convention.

II. PROGRESS IN THE PREPARATION OF THE ASSESSMENT REPORT

12. Ms. Gun Lövblad (Swedish Environmental Research Institute (IVL)) provided an overview of progress in drafting part I of the EMEP Assessment Report covering the European perspective. She presented the extended outline of the report and informed the Task Force about the status of the work. An interim report would be presented, as an informal document, to the EMEP Steering Body in September 2003.

13. Mr. Jerzy Bartnicki (MSC-W) reported on the status of part II of the Assessment Report. He expressed his satisfaction with the good progress in work since the workshop in Vienna in November 2002.

14. Twenty-seven of the 50 Parties to the Convention actively participate in the work on the EMEP Assessment Report. Several of these Parties have not yet completed the measurement data checking process and several have not yet sent any draft of their national assessments. Nineteen Parties (70%) have already completed the checking of their measurement data, three Parties have partly completed and three others have still not completed the measurement data checking process.

15. All Parties were expected to prepare comprehensive drafts of their national assessments before the Task Force's meeting. Six Parties submitted comprehensive drafts, seven submitted first drafts and three submitted an abstract of their national assessments. Four Parties promised to submit their comprehensive abstracts by the end of April.

16. National contributions for the EMEP Assessment Report are in principle limited to 10 pages. In many countries earlier, much larger, national assessment reports already exist and they are of interest to the EMEP assessment task. Links to such large reports are on the EMEP web site for four Parties: Czech Republic, Denmark, Latvia and Lithuania. More will be added by the end of April.

17. During the poster session, experts from 13 Parties presented their work on their national contributions to the EMEP Assessment Report: Belarus (S. Kakareka); Denmark (N. Heidam and J. Illerup); France (L. Rouil and N. Poisson); Germany (M. Wallasch); Italy (C. Perrino); Latvia (I. Lyulko); Lithuania (D. Sopauskiene and D. Jasineviciene); Norway (L. Hole); Poland (G. Mitosek); Spain (M. Fernandez and A. Gonzalez); Sweden (G. Lövblad, Karin Sjöberg and Emma Henningsson); Switzerland, (R. Weber and R. Gehrig); The former Yugoslav Republic of Macedonia (R. Simeva). A short oral presentation was also given for the Netherlands (Pieter Hammingh).

18. The Task Force thanked the experts for their contributions. All posters were considered very useful. They provided interesting information and were intensely discussed during the poster session.

19. Mr. Marco Giannitrapani (United Kingdom) reported on work to detect discontinuities in time-series data. He had applied the methodology to EMEP data series for different countries. The analyses had shown that discontinuities were a common feature in the time series used. In such cases it would be wrong to try to fit a single trend to the data. Some of the peculiarities discovered in the data needed to be discussed with national experts.

III. REVIEW OF THE UNIFIED EULERIAN MODEL

20. At its twenty-sixth session, the EMEP Steering Body had requested the Task Force on Measurements and Modelling to review the validation work of MSC-W and determine whether source-receptor matrices calculated with the Eulerian model would be available in time for the next session of the Steering Body (EB.AIR/GE.1/2002/2, para. 39 (e)).

21. MSC-W currently operates three versions of the model. The UNI-OZONE model version is the mass model version of the unified Eulerian model with full chemistry scheme covering 69 gaseous species, 6 aerosol compounds and 170 reactions. The other two versions of the model are used for testing: UNI-ACID is a simplified nitrogen and sulphur model used for testing and experimental purposes in order to save computer time; UNI-AERO is the research model version that includes aerosol dynamic processes and can evaluate particulate matter (PM) size and number concentrations.

22. Ms. Hilde Fagerli (MSC-W) reported on the performance of the unified Eulerian model over a period of 20 years, emphasizing the changes in atmospheric chemistry over the period and the consequences that these changes had on the parameterization of sulphur chemistry. This type of trend-process study with a single version of the model had been facilitated by the availability of emission and meteorological data at MSC-W.

23. The comparison between model results and observations for 1980 to 2000 for sulphur compounds showed that the SO_2 and SO_4 trends were well reproduced by the model. However, the model slightly overestimated SO_2 and this bias increased for later years (as SO_2 decreased). This can be explained by the co-deposition of NH_3 and SO_2, which increased in the late 1990s as a consequence of higher pH levels in Europe, thus resulting in higher dry deposition of SO_2. To verify this hypothesis further, measurements of dry deposition flux are required. The trend analysis also shows that the coupling with the photochemistry was especially important for SO_2 in the 1980s and the early 1990s. Further model improvements would benefit from level II and level III measurements, including vertical profiles, SO_2 fluxes and separate gas-particle measurements.

24. Ms. Svetlana Tsyro (MSC-W) presented UNI-AERO, the research aerosol dynamic model for EMEP. The evaluation showed that the differences between the model with and without aerosol dynamics were relatively small (<5% for PM2.5, PM<2.5µm, and <10% for PM10, PM<10µ). They were larger over sea and coastal areas, where sea salt was important. The simpler aerosol mass model without aerosol dynamics could therefore be used to calculate preliminary source/receptor-relationships. UNI-AERO was considered as a research tool to assist model development. It was not planned to use it for policy applications for the next three to five years.

25. A comparison with PM10 measurements from rural sites showed satisfactory performance. Some of the underestimation (especially for summer periods) might be due to the model neglecting secondary organic aerosols, re-suspension and wind-blown dust. Any further model improvement, however, was dependent on the availability of measurement data on the chemical speciation and size distribution of aerosol concentrations and primary PM emissions, which were missing at present.

26. Ms. Leonor Tarrasón (MSC-W) reported on the model performance and evaluation requirements of the unified Eulerian model for ozone, providing examples for the Mediterranean region where the correlations were generally lower than for the rest of Europe. The model had been tested for nine different years but only results for three years (1990, 1995, 2000) were presented to characterize trends in model performance. Comparison between model results and observations showed satisfactory correlation and bias values, although the model showed a greater tendency to underestimate peak ozone levels in the year 2000. The performance of the model was consistent with results from ozone trend analyses that indicated a steady decrease in the 1990s of ozone peak levels and an increase in mean ozone concentrations. The underestimation of peak ozone levels in the late 1990s could be related to the increase in background free tropospheric ozone levels, which were currently not included in the model.

27. The unified Eulerian model had participated in the City Delta project model intercomparison study (see para. 29 below), which so far had shown that the model shared problems reproducing night-time NO_2 values in the vicinity of urban areas with most other models using a similar horizontal spatial resolution.

28. The performance of a number of other models was also presented to the Task Force:

(a) Mr. Joakim Langner (Swedish Meteorological and Hydrological Institute (SMHI)) informed the Task Force about the evaluation of the MATCH model (www.smhi.se) using EMEP data. MATCH was a three-dimensional Eulerian transport/ chemistry/ deposition model, using EMEP emission data and chemistry schemes and meteorology data similar to those of EMEP. It could cover different scales ranging from urban to intercontinental. The EUROTRAC aerosol intercomparison study had shown relatively good correlation with observations. Also for ozone,

the model showed good agreement with observation all over Europe (though with decreasing performance for Southern Europe);

(b) Mr. Rainer Stern (Free University Berlin) provided an overview of the REM3-model. The three-dimensional Eulerian model used nested models to cover different spatial scales from the European down to the urban level. It applied CORINAIR emission data and EMEP Coordinated European Programme on Particulate Matter Emission Inventories, Projections and Guidance (CEPMEIP) data for PM. With a focus on the air quality requirements in the EU directives, it had been applied to Berlin. Results were good for ozone, reasonable for NO_2, while there was a need for further work on the PM modelling (in particular, to include secondary aerosols);

(c) Mr. Martin van Loon (TNO, Netherlands) informed the Task Force about the EUROTRAC GLOREAM model intercomparison study. The study had covered April to September 1995 and compared results from six models with EMEP monitoring data (plus some additional data from the Netherlands and Germany). It had concluded that models were capable of reproducing secondary inorganic aerosol levels (in contrast to PM10). With some exceptions, the models showed quite similar behaviour. The conversion rate of SO_2 to SO_4 was generally found to be too slow. All models overestimated nitrate;

(d) Ms. Laurence Rouil (Institute National de L'Environnement Industriel et des Risques (INERIS), France informed the Task Force about modelling work with CHIMERE, since the previous meeting (see EB.AIR/GE.1/2002/4, para. 25). Model results for ozone for the Mediterranean coast showed some problems; there were large differences with measurements taken right at the coast, while observations further away were modelled more precisely. A new parameterization seemed to have improved the fit. Ms. Rouil emphasized that any model evaluation should cover all model outputs and not just focus on one element;

(e) Mr. Ian Rodgers (Innogy, United Kingdom) presented work applying the Models-3 CMAQ model developed by the United States Environmental Protection Agency (US/EPA) to the United Kingdom. The work was done on behalf of the United Kingdom's electricity generators. A broad review of the capability of Models-3 for atmospheric long-range transport and deposition modelling in the United Kingdom had recently been completed. Models-3 gave reasonable simulations of the wet and dry deposition of sulphate, nitrate and reduced nitrogen species and of the atmospheric concentrations of SO_2, NO_2, NH_3 and particulates. Agreement with measurements for wet deposition improved with increasing averaging time and the model gave good results for an annual simulation, the period of most interest for acid deposition. The review concluded that Models-3 was a suitable model for use as a high-resolution long-range transport model for the United Kingdom and Europe.

29. Mr. Kees Cuvelier (JRC) provided an overview of the progress in the City Delta project.

The focus of the project was to provide input for the integrated assessment of the impact of urban air pollution on human health and ecosystems. Eight European cities were covered and seven emission scenarios plus 1999 as the evaluation scenario were analysed. JRC had developed a software tool to assist the graphical interpretation of the results. Mr. Cuvelier presented some of the initial findings, which were subject to final review of the data. Final conclusions would be discussed at a workshop at the end of October. Further information can be found at http://rea.ei.jrc.it/netshare/thunis/citydelta. JRC pointed out that it was ready to offer its experience from the modelling work at the urban scale for an intercomparison exercise at the regional scale.

30. Mr. Frank de Leeuw of the ETC/ACC gave an overview of the data in AIRBASE and presented an analysis of the data showing the trends in the 1990s for SO_2, NO_2 and ozone. For the SO_2 annual mean there is a clear downward trend and for NO_2 a modest downward trend. Overall there is an increasing trend in annual mean ozone, but this was different for different stations. Mr. de Leeuw offered the AIRBASE data for use in the EMEP Unified model review.

31. Mr. M. Millán (CEAM) presented measurement data to illustrate ozone dynamics in the Mediterranean region and to explain why European-scale models had difficulties representing that special situation. Aircraft measurements made near Valencia showed the changing concentrations when moving inland from the sea. These explained the effects of the interactions between the sea breezes and the upslope winds on the formation of (reservoir) layers of ozone over the sea, and their return inland several days later. The special orographic effects led to sharp discontinuities in ozone concentrations at a relatively fine scale.

32. Mr. Millán also presented some results of Mr. Xavier Quérol on the transport of Saharan dust to the Spanish coast. This was an important phenomenon to explain PM2.5 and PM10 concentrations in the Mediterranean region.

33. The Task Force thanked all presenters for their contributions. Based on the information received, it discussed the requirements for further work on the review of the Eulerian model. The review process would be open to other modelling groups and to monitoring experts and any cooperation would be welcomed. In order to increase transparency, a priority task was to prepare full documentation of the unified Eulerian model. This would be completed before the Steering Body's session and posted on the EMEP web site. A workshop on the model review would be organized under the auspices of the Task Force in Oslo on 3-5 November 2003 (to be confirmed).

34. MSC-W distributed copies of scatter plots and frequency distribution for SO_2, NO_2, PM10 and ozone concentrations, and precipitation concentrations of sulphate, nitrate and ammonium for 1990, 1995 and 2000. Taken together, these plots indicated an encouraging level of model performance. The Task Force agreed that MSC-W should proceed with the calculation of

preliminary source-receptor relationships for presentation to the EMEP Steering Body at its twenty-seventh session. These should be considered preliminary until further examination at the Task Force's workshop on the review of the unified Eulerian model in November 2003.

35. The Task Force noted that generally some 20-30% of the total measured PM mass remained unexplained. An atmospheric chemistry model could not fully represent the observed mass. The problem was that data on the chemical speciation and size distribution were not available and therefore the "unexplainable" part could not be comprehensively explained. Aerosol water might be important in this context, but further research was needed before this could be resolved. Scientists working in this area should be invited to the review workshop in order to discuss the issue further.

36. The source-receptor relationships will need evaluation as one of the most important model outputs. They will be the most important link to policy applications through their use in integrated assessment modelling. The evaluation should be finalized in 2003 in order to avoid delays in the policy process.

37. The Task Force also noted the use of indicators (as for instance discussed at the joint EUROTRAC LOOP / EMEP workshop held on 3-6 December 2001 in Gerzensee (Switzerland), EB.AIR/GE.1/2002/10) in reviewing the model and evaluating the model response to emission changes. It also agreed on the need for a sensitivity analysis to evaluate the variability due to changes in some of the key model parameters. Furthermore, it was important to look at the changes over the years to see whether the model could be used for forecasts.

38. The Task Force agreed that the review requested by the Steering Body would be completed at the workshop in Oslo and would address the fitness of the model for assessing the regional concentrations and long-range transboundary fluxes of sulphur, oxidized and reduced nitrogen, VOCs, ozone and suspended particulate matter. The review should focus on the ability of the model to represent well the response to changes in emissions. It should follow state-of-the-art methodology and be in reasonable agreement with measurements given the large area covered and large variety of emission situations to be reflected.

39. The evaluation of the Eulerian model is planned to consist of three elements:

(a) An examination of the process and meteorological parameterizations, chemical mechanisms and the sources of model input data;

(b) An evaluation of the model performance against daily observations of key model species and fluxes from the EMEP, AIRBASE and national monitoring networks for 1980, 1985, 1990, 1995, 1997, 1998, 1999 and 2000; and

(c) A consideration of the source-receptor relationships for sulphur, nitrogen, ozone and suspended particulate matter (PM mass).

40. In preparation for the workshop, the experts participating in the work of the Task Force are asked to:

(a) Consider the choice of process and meteorological parameterizations, chemical mechanisms and the sources of model input data used in the EMEP Model;

(b) Quantify what would be considered state of the art in terms of model performance against observations based on their own national modelling studies;

(c) Identify key field campaigns for model evaluation purposes; and

(d) Examine source-receptor relationships determined from their own national modelling studies.

Task Force experts were invited to specify by the end of May what information could be provided and what tasks could be contributed to the workshop in Oslo. Based on this, the agenda for the workshop would be drawn up before the end of June. Progress would be continuously presented on a separate web site linked to the Task Force's web site.

41. In this context, the Task Force welcomed the offer by JRC to assist in a model intercomparison exercise for regional-scale models. This could be useful for the review of the EMEP model, especially if it could already be started before the November workshop, but timing depended on the availability of resources at JRC and at the participating modelling groups in 2003. Alternatively, the model intercomparison could be coordinated by TNO using the GLOREAM methodology.

IV. RECENT HEAVY METALS AND POPs MODEL DEVELOPMENTS

42. Mr. Victor Shatalov (MSC-E) presented the technical report on the assessment of long-range transport of mercury, PCBs and γ-HCH to the Russian North prepared by MSC-E for cooperation with the Artic Monitoring and Assessment Programme (AMAP). He reported on the progress in modelling POPs and mercury at the hemispheric scale and showed examples, for mercury, PCBs and γ-HCH, of the main results that could be produced with the MSC-E model: pathways of pollutant transport over the Northern hemisphere; fields of deposition and concentrations in various environmental compartments; trend analysis; redistribution between environmental compartments; and source-receptor relationships. Particular attention was paid to model validation, both through comparison with measurements and also through model intercomparison studies. Recent development of modelling at the hemispheric scale focused, inter alia, on examining the influence of sea ice and on mercury depletion events. MSC-E had also made progress in the development of a procedure for the evaluation of new substances.

43. The Task Force noted the good progress in the work and encouraged MSC-E to continue to work along the same lines. In the discussion, the high share of natural emissions and re-emissions of mercury reported by MSC-E was noted. MSC-E had conducted some sensitivity analysis on these data, but there was insufficient information to be able to better quantify the anthropogenic

share in these emissions.

44. The Task Force also noted the plan of MSC-E to move towards global modelling in order to evaluate the magnitude of transport between the hemispheres. It recognized that this was difficult in view of the lack of data on emissions and measurements.

45. Mr. John Munthe (IVL) provided an overview of recent findings on the atmospheric cycling of mercury. He highlighted the importance of the global background for total gaseous mercury, which indicated that mercury was a global pollutant. In contrast, for total particulate mercury, measurements showed a clear gradient for stations further away from the source regions. Re-emissions of mercury from the sea surface had been found to be comparable to wet deposition. They were especially high in the Mediterranean. Mr. Munthe expressed his hope that the entry into force of the Protocol on Heavy Metals would help to enhance research on mercury so that more data would become available. He also stressed the importance of enhanced cooperation with the various policy initiatives related to mercury at the international level, in particular those of the United Nations Environment Programme, the Arctic Monitoring and Assessment Programme and the European Union.

46. Mr. Gerhard Petersen (GKSS, Germany) provided an overview of recent developments in mercury (Hg) modelling. He highlighted the different research activities and the importance of the model intercomparison conducted by MSC-E. GKSS used the community multi-scale air quality (CMAQ) model developed by US/EPA to prepare an advanced Hg physical chemistry systems model. Modelling results indicated the importance of re-emissions from the soils in areas with high historic emissions (e.g. eastern Germany). Further model development required better information on emissions. Recent flue-gas measurements at power plants had been used to improve existing speciated Hg emission inventories. Recent measurement campaigns allowed a better evaluation of modelling results. Problems remained with the quality of modelling of reactive gaseous Hg, which showed large differences when compared with measurements. The situation was better for total particulate Hg. One of the major gaps in the work was the modelling of methyl mercury.

47. The Task Force took note of the information presented. It recognized the importance of cooperation with international and national modelling groups to advance the work.

48. Mr. Sergey Dutchak (MSC-E) gave an overview of work done and planned to review the EMEP heavy metals model. The EMEP Steering Body had requested MSC-E to prepare for a model review and MSC-E would like to conduct this work in close consultation with the Task Force. Given the lack of monitoring data and the uncertainty in some model input parameters, the evaluation of a heavy metals model had to be complemented by other elements in addition to a simple comparison with observations. It should include a model sensitivity analysis of the most important model parameters to identify key uncertainties, in particular emission data. The most

important element of a model review would be model intercomparison studies. A model intercomparison study for lead and cadmium had been conducted between 1996 and 2000; one for mercury was under way (see below). Comparison with measurements was important and had shown satisfactory results for lead (modelling results within a factor of 2 of observations). For cadmium, such a comparison gave less satisfactory results.

49. Mr. Ilia Ilyin (MSC-E) reported on results of the intercomparison study of numerical models for the long-range transport of Hg (stage II of the intercomparison study). Seven models from Europe and North America had participated in stage II. The model validation used data from a single campaign on measurements of total gaseous mercury (TGM), total particulate mercury (TPM) and reactive gaseous mercury (RGM) from five monitoring stations in Europe. The comparison showed that peak concentrations of TGM were generally underestimated. Average TGM concentrations were well reproduced by the models. The difference between average observed and modelled TGM concentrations did not exceed 30%. In comparison with measurements, concentrations of TPM differed within a factor of 2. For RGM the difference was larger. Models demonstrated good temporal correlation with TPM observations. The study indicated that current knowledge on RGM atmospheric behaviour needed to be improved. MSC-E results agreed within a factor of 2, both for RGM and for TPM. The EMEP/MSC-E model performs well when comparing results with observations and with results of other models. Stages III and IV of the model intercomparison would be devoted to monthly and annual data and to comparison of transboundary transport budgets for selected countries.

50. The Task Force welcomed the progress in the work on the model intercomparison. It gave a good example of the kind of work that would also be useful for the review of the MSC-W unified Eulerian model. The Task Force expressed its support for the plans of MSC-E for the further review of the heavy metals model and suggested that the discussion of this work, with a focus on cadmium and lead, should be part of its work-plan for 2004. The Task Force recognized that model review had to remain a continuous activity to be pursued as data availability and quality, and model performance, were improved.

51. The Task Force recognized that emission data quality, for instance for cadmium, was the most important limitation for further model improvement. It decided to draw this to the attention of the EMEP Steering Body so that work under the Task Force on Emission Inventories and Projections could be initiated without unnecessary delay.

V. APPROVAL OF MONITORING DATA REPORTS

52. The EMEP Steering Body, at its twenty-sixth session, had adopted guidelines for reporting by the EMEP centres. Under these guidelines, the EMEP task forces would have a much greater responsibility to review the work of the centres. The Task Force on Measurements and Modelling would, in particular, be requested to review the technical and scientific reports and notes prepared

by the centres. The guidelines also foresaw that experts nominated for the task forces would approve data reports. For monitoring, in contrast to emissions and integrated assessment modelling, there were no nominated focal points. There were, however, nominated National Quality Assurance Managers.

53. In the light of this situation, the Steering Body, at its twenty-sixth session, had requested the Bureau, in consultation with the Task Force, to prepare a proposal concerning the establishing of national focal points for monitoring. The Bureau, at its meetings in November 2002 and February 2003, drew up a draft proposal.

54. The Bureau noted the need to safeguard the Task Force on Measurements and Modelling as an open body that enabled free scientific discussion and to make clear that the EMEP representatives were responsible for ensuring that the EMEP work-plan was implemented at the national level. It decided to propose the following solution:

(a) The responsibility for ensuring that measurement data were reported in line with the annual work-plan adopted by the Executive Body would remain with the national representatives of the EMEP Steering Body;

(b) As foreseen under the new reporting guidelines, national experts nominated for the Task Force on Measurements and Modelling would be responsible for approving monitoring data reports. Parties, through their EMEP Steering Body representatives, would be invited to nominate experts for monitoring data approval. For those Parties that did not nominate experts, the Steering Body representative would be responsible for approving monitoring data reports;

(c) The Task Force on Measurements and Modelling would remain open to broad participation of relevant experts. Parties should be encouraged to send monitoring and modelling experts to its meetings to ensure a broad basis for discussion. Parties that still wished to do so were invited to nominate additional experts for the Task Force;

(d) The functions of the National Quality Assurance Managers would remain unchanged as outlined in the EMEP Monitoring Manual (chapter 5.1).

55. The Bureau's proposal was presented to the Task Force on Measurements and Modelling. The Task Force agreed with the proposal and decided to present it to the EMEP Steering Body for approval at its twenty-seventh session.

VI. FURTHER WORK

56. During the fourth meeting, the following specific topics were identified for discussion in 2004:

- Review of the cadmium and lead modelling work (with a view to its use for deposition modelling with respect to critical limits);
- Finalization of the Assessment Report;
- Process-analysis and model intercomparison with the unified Eulerian model;
- Measurements and modelling of VOCs.

57. The Task Force agreed to hold its fifth meeting in March/April 2004. It is foreseen that this meeting will be organized in conjunction with a meeting of the WMO Global Atmosphere Watch.

58. The workshop on the unified Eulerian model review will be organized under the auspices of the Task Force in Oslo on 3-5 November 2003 (to be confirmed).