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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 4 (a)-(e) of the provisional agenda

MEASUREMENTS AND MODELLING

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

Introduction

1. This report presents progress in atmospheric measurements and modelling as reported and discussed at the fifth meeting of the Task Force on Measurements and Modelling, held in Prague on 31 March -2 April 2004. The Task Force discussed in particular the progress in the work on the assessment report, the review of the new unified Eulerian model, the draft EMEP monitoring strategy, recent heavy metals and persistent organic pollutants (POPs) model developments, and cooperation between EMEP and the World Meteorological Organization's Global Atmosphere Watch programme (WMO/GAW).
2. Experts from the following Parties to the Convention participated: Austria, Belarus, Croatia, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Netherlands, Norway, Poland, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom and United States of America.

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3. Furthermore, representatives from the EMEP Centres, 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 Community's Joint Research Centre (JRC), the European Environment Agency (EEA), the European Chemical Industry Council (CEFIC) were present. The secretariat also attended.
4. Ms. Liisa Jalkanen (WMO) and Mr. Dick Derwent (United Kingdom) co-chaired the meeting.
5. The meeting was hosted by the Czech Hydrometeorological Institute. The Task Force was invited to visit the Kosetice monitoring station near Prague. The Task Force expressed its great appreciation to Mr. J. Santroch of the Czech Hydrometeorological Institute for the warm hospitality.
6. The presentations made at the fifth meeting of the Task Force are available on the Internet at <http://www.nilu.no/projects/ccc/tfmm/>.

I. PROGRESS IN THE PREPARATION OF THE EMEP ASSESSMENT REPORT

7. Mr. Anton Eliassen (Norwegian Meteorological Institute) provided an overview of progress in drafting the EMEP assessment report chapter by chapter. Part I of the report, the European assessment, as well as its executive summary were almost complete. The executive summary would be available on the EMEP web site for comment by the end of May.
8. The national contributions, which were included in part II of the report, would be published in full. Mr. Eliassen stressed the importance of the involvement of the Parties in the EMEP work and thanked the countries that had provided contributions to the EMEP assessment report. The executive summary would be submitted to the EMEP Steering Body. The full report would be printed and distributed to the EMEP Steering Body and the Executive Body.
9. The draft report would also be sent to the Bureau of the Working Group on Effects for comment. The Working Group had also produced a substantive report on the effects over the past 25 years. An executive summary would be made available for the Steering Body's next session. The final draft and the executive summary of the report of the Working Group on Effects would also be provided to the EMEP centres for comment. The timetable for the preparation of both reports was similar, since both aimed to be out in time for the 25th anniversary of the Convention.
10. Ms. Gun Lövblad (Swedish Environmental Research Institute) presented the main results of the European assessment of the trends in sulphur, nitrogen and photo-oxidants. Sulphur emissions had decreased considerably over the past 25 years: by 70% on average for Europe. In some areas the decrease reached almost 90%, although there were areas with increasing emissions.

The biggest fall had been observed in the early 1990s, mainly as a consequence of economic restructuring in Eastern Europe. The emission decrease had led to a fall in SO₂ concentrations all over Europe. Episodes with high SO₂ concentrations had been reduced, both in frequency and in magnitude. Sulphate particles in air had also decreased, although less than SO₂ emissions. This could be explained by the fact that the constant ozone and ammonia levels had meant a nearly constant oxidizing capacity and hence an increasing sulphate-to-SO₂ ratio. Sulphate in precipitation had decreased in line with particulate sulphate.

11. Emissions of NO_x and ammonia had also been cut. There were areas with increasing emissions and areas with decreases of almost half the level in the 1980s. NO₂ concentrations had declined. Total inorganic nitrate and ammonium levels had shown similar decreases but these had not been as large as those for NO_x emissions. Trend evaluation for ozone had presented more difficulties. Concentrations of ozone exceeded the critical levels for crops and forests across much of Europe. A reduction in peak ozone levels, which was in line with reductions in precursor emissions, had been observed. An increase in global background ozone had been reported at Mace Head in Ireland.

12. Decreases in the wet deposition of base cations were also observed. The data available were not sufficient to calculate critical load exceedance maps so mapping of base cations would be important work for EMEP for the future. More observational data on particulate matter (PM) were thought necessary, as concerns were growing across Europe about achieving air quality targets for 2010.

13. Mr. Ilia Ilyin (MSC-E) presented the main results of the EMEP assessment report on the trends in heavy metals and POPs. The work on this issue had been carried out jointly by MSC-E and CCC. Chapters 7 (heavy metals) and 8 (POPs) focused on European contamination and its changes during the period 1980-2000. The chapters dealt with emissions, measured and modelled concentrations in air and depositions, and their trends, as well as modelled transboundary and intercontinental transport. In addition, ecosystem-dependent depositions and atmospheric pollution to marginal seas were given.

14. The Task Force agreed that it would be useful to put together the UNECE contributions of POPs to the Arctic.

15. The Task Force expressed its thanks to all the Parties that had contributed to part II of the report. It also acknowledged the work done by the centres in compiling part I. The report provided a good picture of the achievements over the past 25 years in decreasing emissions and deposition loads. In order to assess whether that level of achievement was sufficient and to identify what remained to be done, the contribution from the Working Group on Effects would be needed.

16. Participants were invited to comment on the draft executive summary by the end of May. They were also invited to check that the conclusions in part I about the EMEP area as a whole were in line with their own national conclusions, and provide references to any relevant national studies or publications that might be available. Feedback on the national assessments in part II, and in particular the quality of the EMEP data, would be useful in terms of the future monitoring strategy.

II. REVIEW OF THE UNIFIED EULERIAN MODEL

17. At its twenty-seventh session, the EMEP Steering Body had requested the Task Force on Measurements and Modelling to review the unified EMEP model (EB.AIR/GE.1/2003/2). The format of the review had been discussed at the fourth meeting of the Task Force in Valencia, Spain, in 2003 and it had been agreed that it would contain three elements: an examination of the parameterizations employed in the model; an evaluation of the model performance against observations; a consideration of the source-receptor relationships provided by the model.

18. Mr. Derwent presented the results of the workshop on the evaluation of the unified Eulerian model, held in Oslo in November 2003. The workshop had concluded that the unified model represented a substantial improvement on the previous EMEP models. Nevertheless, it recommended that consideration should be given to a number of issues in both the short term and the long term within the future development programme for the modelling. It was important to discuss these in order to give some guidance for the future activities of MSC-W.

19. Ms. Svetlana Tsyro (MSC-W) provided further information about the modelling of particle-bound water, an issue highlighted by the review of the unified EMEP model. Accounting for particle-bound water reduced model underestimation significantly and improved the correlation with observations. In questioning Ms. Tsyro, issues were raised about the experimental reality of particle-bound water and the detailed behaviour of the particle composition analyses conducted in Spain.

20. Ms. Tsyro also presented results of the work by MSC-W on the empirical analysis of the contribution of secondary organic aerosols to total PM mass. An approach had been developed to deal with primary emissions of organic carbon particles and with secondary organic particle formation from the oxidation of man-made aromatic compounds and natural biogenic compounds. In the next stage, this approach would be implemented in the EMEP model and evaluated against observations.

21. Mr. Marten van Loon (TNO, Netherlands) informed the Task Force about the main results of the TNO/EMEP intercomparison of regional models over Europe. The goal of this intercomparison was to establish the performance of the unified EMEP model amidst other state-of-the-art models. The intercomparison had been conducted for two base years - 1999 and 2001. For both years the EMEP model showed a good level of model performance for all compounds

considered. It was also demonstrated that ensemble modelling gave promising results. A full report of the study would be available by the end of April.

22. Mr. Kees Cuvelier (JRC) informed the Task Force about recent developments in the EURODELTA project. Inconsistencies in the emission inventories had been sorted out and the first results were expected before the summer. The full results would be discussed at a workshop in December. It was proposed that the conclusions should be reported at the next meeting of the Task Force.

23. The model review showed that the model was fit for policy purposes with regard to some compounds, but with regard to others, such as particulate matter, further work was needed. Work on secondary organic aerosols in PM was continuing. The identification of the contribution of primary organic aerosols, however, required improvements in the emission inventories. Concerns were expressed about the delay in having a policy tool available to describe the whole of the particulate mass. The review had also shown that the EMEP model underestimated peak ozone concentrations, in common with other state-of-the-art ozone models. The model was, however, suitable for the assessment of vegetation exposures and of human health effects on the regional scale.

24. The Task Force thanked the experts who had attended the workshop in Oslo and MSC-W for its work in preparation for it. The Task Force endorsed the report of the review of the unified EMEP model and its conclusions (EB.AIR/GE.1/2004/6).

III. RECENT HEAVY METALS AND POPs MODEL DEVELOPMENTS

25. Mr. Victor Shatalov (MSC-E) presented information on MSC-E Technical Report No. 4/2003 "Persistent Organic Pollutants in the Environment" and demonstrated the approach taken to model validation. He summarized the results of the recent MSC-E work on modelling of persistent organic pollutants (POPs) (PAHs, HCH, PCDD/Fs, PCBs, HCB) and the assessment of POPs contamination in the EMEP region. Information on hemispheric modelling and on an approach to the evaluation of new substances was also presented.

26. The Task Force recognized that the combined measurement/modelling approach was reasonable for evaluating POP contamination levels in Europe. It was noted that the results obtained could be used to support the Working Group on Effects and the Task Force on POPs.

27. Mr. Jan Erik Hanssen (CCC) presented the results of the EMEP POP laboratory comparison conducted in 2000-2002, addressing the comparability of the results of the monitoring of POPs ('EMEP POP laboratory comparison 2000-2002', EMEP/CCC Report 10/2003).

28. Mr. Shatalov reported on progress in the POP model intercomparison study. So far, the study had involved 17 models from different European countries, Canada and the United States of America and more than 20 experts on modelling, measurements and emissions. During the first stage of the intercomparison, the physical and chemical parameters used in the participating models were compared. The second stage would focus on comparing model outputs and sensitivity studies with respect to model parameterizations. Mr. Shatalov drew attention to the meeting planned for August, where the model intercomparison would be further discussed.

29. Mr. Oleg Travnikov (MSC-E) described progress in modelling the atmospheric transport of mercury (Hg) (EMEP/MSC-E Technical report No. 1/2003). A short overview of the modelling approach was given, together with a description of the main model improvements. It was demonstrated that the model was able to estimate Hg pollution at both the European and hemispheric scales as well as pollution trends. The model evaluation against measurements showed a satisfactory performance for mercury concentrations in air but some overestimation was noted for wet deposition fluxes. Current activities on model intercomparisons were described and plans for further model evaluations were announced.

30. Mr. Ilyin presented information on "Heavy metals: transboundary pollution of the environment". He reported on pollution levels and trends for 1990-2001 and source-receptor relationships for 2001 (EMEP/MSC-E Technical report No. 5/2003). Detailed comparisons of model results with observations revealed some discrepancies that should be jointly interpreted by MSC-E, CCC and national experts. He also presented the contribution of MSC-E to the Expert Group on Heavy Metals: pilot calculations of Ni and Cr pollution and ecosystem-dependent deposition for the Working Group on Effects.

31. During the discussion that followed, the importance of access to measurement data from different programmes, as well as of closer collaboration between measurement and modelling experts, was stressed. The Task Force noted that emission data of heavy metals and persistent organic pollutants were underestimated and drew the attention of the Steering Body to the need for improving the quality of the emission inventories for these pollutants.

32. The Task Force took note of the information presented and thanked the experts who had worked on the technical reports.

33. At its twenty-seventh session the Steering Body had requested plans to be drawn up for a review of the MSC-E model. Ms. Marina Varygina (MSC-E) gave an overview of the plans to review the MSC-E models on heavy metals and POPs. She stressed that MSC-E would continue model validation, including sensitivity studies, intercomparison of models and comparison of modelling results with measurements, a process which had been started in 1995. Model validation was one of the most important parts of the model review and it had to be done in close cooperation with measurements and emissions communities. She announced that a workshop on

the model review would be organized in Moscow for November 2005. In preparation for the workshop it was proposed to hold a small meeting with representatives of the Steering Body's Bureau, the Task Force, the Task Force on Emission Inventories and Projections and the EMEP centres in September 2004 in Moscow. The format of the review would be discussed and approved at the sixth meeting of the Task Force during the spring of 2005.

IV. MONITORING

A. WMO Global Atmosphere Watch (GAW)/EMEP Cooperation

34. Mr. Joerg Klausen (Swiss Federal Laboratories for Materials Testing and Research (EMPA)) gave a short overview of the activities of the GAW network. He presented the mission and the structure of the GAW programme and described the role of the global and the regional stations, the contributing networks and presented the joint GAW-EMEP sites that were registered in both networks. GAW had not been able to support many regional stations so far and cooperation with EMEP in this respect was particularly welcome. If EMEP had the capacity to support regional calibration centres then GAW could support them through its world calibration centres. EMEP was recognized by GAW as a contributing network. There were common parameters between EMEP and GAW and possibilities for future cooperation on quality assessment/quality control (QA/QC) existed. EMEP was invited to work with GAW on formalizing cooperation on QA/QC structures for ozone. Harmonization and cooperation on QA/QC for volatile organic compounds (VOCs) would benefit both networks.

35. Mr. Yrjo Viisanen (Finnish Meteorological Institute (FMI)) presented the key FMI activities in background air quality monitoring. Its strategy had been to cut the number of monitoring stations and to have a smaller number of stations measuring a greater number of parameters. The draft EMEP monitoring strategy required Finland to add one new station to the existing four EMEP stations. This would be the existing Pallas station, which had not been officially recognized as an EMEP station so far.

36. Mr. Jan Eiof Jonson (MSC-W) made a presentation on the verification of ozone vertical profiles using radiosonde data. He described the EMEP chemistry model and the lateral boundary concentrations for ozone. There was a tendency for the model to underestimate ozone levels in the mid-troposphere and to overestimate them in the lower troposphere.

37. During the discussion on the measurement collaboration between EMEP and GAW, Mr. Wolfgang Fricke (Germany) expressed the willingness of the GAW station Hohenpeissenberg to contribute to the EMEP programme as a level 3 joint GAW/EMEP supersite, as long as no additional costs were involved, for instance, for reformatting data for submission to data centres. Mr. Jaroslav Santroch (Czech Republic) commented that in small European countries, where the meteorological services ran both EMEP and GAW programmes, the requirements should be the same for both. Mr. Eliassen, President of the WMO Commission on Atmospheric Sciences,

explained the procedure for a station to become a GAW station. The WMO Permanent Representative, usually the head of the meteorological service, would need to make a formal request to the WMO Secretary-General. He also noted that GAW and EMEP should work closer together to achieve their goals.

38. Ms. Wenche Aas (CCC) gave an overview of the QA/QC activities in EMEP. She stressed that cooperation between the countries and the EMEP centres was crucial in these activities, which included site characterization, documentation of methods, detection limits, precision, accuracy, and instructions for maintenance and calibration. Other issues covered were the manual and standard operating procedures, laboratory intercalibration, field comparison, training courses, and data checking and validation, and flagging data that were not of good quality. Training courses were conducted annually according to the needs.

39. Ms. Liisa Jalkanen (WMO) briefly presented the QA/QC activities in GAW. These were divided amongst the scientific advisory groups, quality assurance science activity centres, world calibration centres, world data centres and GAW stations. The GAW central facilities were listed by measured species in table 1 of the Strategy for the Implementation of the GAW Programme 2001-2007 (GAW report No. 142). All of these were voluntary contributions from countries to GAW and some gaps still existed in these facilities.

40. Mr. Alfred Wiedensohler (Germany) gave an overview of the activities of the World Calibration Centre on physical aerosol properties. The Centre was initiated by the Scientific Advisory Group of WMO, hosted by the Institute for Tropospheric Research, and funded partly by the German Federal Environmental Agency and partly by the European Union (EU). Its main tasks were the training of station personnel in the measurement of aerosols, providing advice on the implementation of aerosol properties, and the conduct of site audits to improve data collection and ensure data quality.

41. Mr. Timothy Coleman (United States) presented two of the QA/QC activities of the GAW precipitation chemistry programme. He drew attention to a guidance document for the GAW precipitation chemistry programme. Its purpose was to provide users with recommendations for best practices, station siting, field and laboratory operations, data management and quality control. Results were presented from the biannual GAW laboratory intercomparisons.

42. Mr. Klausen presented an overview of the gas calibration activities in GAW. He outlined the general principles that were followed in gas calibration. High-quality trace gas measurements required a common point of reference, a central facility to maintain and propagate the scale, short traceability chains, and mechanisms to control the quality of measurements, such as on-site performance audits and intercomparisons. Formal collaboration and harmonization should be improved between EMEP and GAW for O₃, CO, SO₂, NO, NO₂ and VOCs.

43. Ms. Katja Mannschreck (Germany) presented a brief overview of the training activities of the GAW Training and Education Centre. These focused on two-week courses twice per year aimed at technicians and junior scientists working at stations belonging to GAW, EMEP or partner programmes and involved in measurements and/or data evaluation. The courses covered sampling and measurement techniques, quality assurance and quality control, data handling, data evaluation and interpretation, data submission to world data centres, atmospheric chemistry and physics.

44. On quality assurance, quality control and training it was noted that there were many activities in both GAW and EMEP and the efforts were not duplicated. The GAW programme was launching a calibration centre for chemical properties for aerosols. The possibility of linking with EMEP on this should be explored. It was suggested that a small meeting on collaboration in QA/QC activities in GAW and EMEP should be organized.

45. Mr. Kjetil Torseth (CCC) presented the data flow arrangements made in the framework of CREATE (Construction, use and delivery of an European aerosol database). He highlighted the first achievement of the project, namely the harmonization of the data flow in EMEP and in GAW. He outlined the solutions that were identified to minimize the duplication of data flow and the efforts for both the data providers and the database, while allowing EMEP/CCC and GAW/World Data Centre on Aerosols to fulfil their objectives. He also presented some of the challenges before the CREATE arrangement as a general model for the EMEP/GAW calibration, including issues of identity and acknowledgement, national calibration, funding issues, openness and transparency versus intellectual rights, and technical harmonization for data submission procedures, data updates, and comparability.

46. Mr. Frank Raes (JRC) reported on aerosol-related work within GAW, and in particular the World Data Centre on Aerosols. The centre had set up an agreement with EMEP/CCC regarding data exchange, and similar agreements were under way with the Canadian and United States networks. The focus in 2004 would be on integrating data from various networks measuring aerosol optical depth.

47. The Task Force noted that Parties should be encouraged to provide data to the World Data Centre on Aerosols in order to have as complete a world aerosol report as possible.

B. The EMEP monitoring strategy

48. The EMEP Steering Body, at its twenty-seventh session, concluded that the draft strategy should be used as a basis for further discussions with the Parties on the details of the level-by-level approach, and the Task Force was asked to participate and advise CCC in the preparation of a final version of the strategy for the next session of the EMEP Steering Body.

49. Mr. Kjetil Torseth (CCC) introduced the revised monitoring strategy. He proposed a reformulation of the objectives for EMEP monitoring, namely to provide in the long term, a full description of the essential physico-chemical data in air and precipitation to make it possible to understand the long-range transboundary transmission of air pollutants and the processes occurring during transmission. For this purpose observations should be made with a temporal resolution taking into account the synoptic scale transport (thus recommended not to exceed 24 hours). EMEP monitoring should also include the use of other data in order to assess the deposition fluxes, exposure levels and their associated trends adequately. It was proposed to keep the level definition of the initial proposal, but to make adjustments regarding the minimum detailed requirements. A concept for a "value-based" system was also proposed. Mr. Torseth stressed that the new monitoring strategy should be ambitious, but at the same time realistic. It should ensure the continued operation of daily measurements with sufficient spatial coverage (all relevant species in both air and precipitation). It should acknowledge other data sets that support EMEP monitoring. The strategy also needed to take into account the widely varying capacities for implementation of the strategy among the Parties.

50. Ms. Leonor Tarasson (MSC-W) introduced the EMEP monitoring strategy from the point of view of model development. She presented the main goals of the present strategy and stressed the importance of daily monitoring data in EMEP. To understand the process, allocate sources and explain observed trends, it was also important to measure all compounds at the same place, at concurrent time periods, and to measure concentrations both in air and in precipitation. She invited countries particularly in Southern and Eastern Europe to complete the EMEP monitoring requirements for level 1 either through extending the capacities of existing EMEP stations or by building synergies with other networks. She stressed that the largest challenge in the new EMEP monitoring strategy was the extension of the programme to include level 2 and level 3 stations. By this means, the much needed information on PM and VOC speciation that would be essential for the further success of EMEP could be generated.

51. Ms. Aas outlined the current deficiencies in EMEP monitoring in relation to the requirements and associated costs to implement of the draft monitoring strategy. The calculation of the costs was based on one station per 50,000 square km with a few exceptions. She presented the initial offers for supersites. She illustrated the differences between the current situation and the requirements of the new monitoring strategy. At present there was a lack of level 2 sites. A comparison between EMEP sites and the International Cooperative Programme (ICP) on Forests sites was presented. For level 1, some sites were missing in Eastern and Southern Europe and countries had indicated their willingness to start measurements.

52. Mr. Sergey Dutchak (MSC-E) discussed the issues of temporal resolution and the specific requirements for model validation for heavy metals and POPs. Special attention should be paid to the precision of individual measurements and the representativeness of individual sites. The Task Force noted that the goals of the UNEP global network for monitoring of chemicals (POPs) and

those of the EMEP monitoring network had much in common. Closer and more formal cooperation between UNEP and EMEP would be highly appreciated. The Task Force requested that there should be harmonized monitoring for the Stockholm Convention and the UNECE Protocol on POPs.

53. Mr. Hans-Christen Hansson (Sweden) presented a case study in the Nordic countries on aerosol measurements. He outlined the needs for regional monitoring of ecosystem effects, air quality and climate change. The results of the case study showed that a harmonised monitoring strategy with different networks was necessary to meet different objectives; the geographical distribution of the measurements had to be optimized. PM, and other particle measures, in background air was crucial for the Nordic countries. Chemical speciation including water content and size distribution (source identification) and 24h (or shorter) measurement frequency were necessary.

54. In discussing the strategy, it was pointed out that EMEP should refocus its activities according to the challenges and priorities, without discontinuing the monitoring of traditional pollutants. It was important for the new monitoring strategy to be implemented across the whole of the EMEP region and therefore it should adopt a flexible approach.

55. Mr. John Rea (United Kingdom) was concerned to get as much policy-relevant science as possible from the available monitoring resources. The issue was that the draft strategy's focus on an extensive mandatory level 1 network would reduce the resources available for levels 2 and 3.

56. Mr. Mark Sutton (Centre for Ecology and Hydrology, United Kingdom) gave a presentation on how to meet the scientific objectives for European monitoring of transboundary air pollution in the most cost-effective way. For the assessment of long-term trends and spatial patterns, the usefulness (and cost-effectiveness) of monthly monitoring for a wide variety of pollutants was demonstrated with examples of data collected in the United Kingdom, showing the importance and feasibility of achieving a high site density. A more flexible approach within the strategy would allow Parties to choose whether to focus on level 1 or a combination of levels 2 and 3, supported by weekly or monthly monitoring, depending on regional priorities, experience and the relative importance given to the different purposes.

57. The following countries gave brief overviews of their national monitoring strategies and noted the possibilities for implementing the proposed monitoring strategy: Austria, Belarus, Croatia, the Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Netherlands, Norway, Poland, Serbia and Montenegro, Slovakia, Slovenia, Spain, Switzerland, Ukraine and United Kingdom.

58. The experts endorsed the need for an ambitious monitoring strategy and expressed their thanks for the work done so far by CCC. The Parties had found the monitoring strategy useful in evaluating their current monitoring activities and designing their future plans. The level-by-level

approach was warmly welcomed and the experts were generally supportive of the level 1 approach based on daily measurements. The Parties of Eastern Europe not contributing to EMEP monitoring expressed their willingness to implement the level 1 activities. It was noted that the Parties already contributing to EMEP were taking up the challenges implied by levels 2 and 3.

59. The following points were raised by the Task Force for consideration by CCC in finalizing the revised monitoring strategy before submitting it to the EMEP Steering Body: it should be clearly linked to the needs of the Convention; it should contain a clear description of the EMEP modelling teams' monitoring needs; the spatial density of sites should be based on pollution gradients; the future focus should be on ozone and particles; it was important to monitor the intercontinental input of heavy metals, POPs, PM and O₃; the monitoring should provide support for the flux-based approach to ozone effects; there were reservations concerning the mandatory methods for nitrate and ammonium; the spatial coverages generated for ammonia, base cations, elemental carbon/organic carbon, HMs and POPs would not be adequate; no consideration had been given to cost-effective and simple methods or to the difficulties in data transfer for the level-3 sites; and there had been no harmonization of measurement methods between EU and EMEP for heavy metals. The Steering Body should clarify the priorities between the various measurements because it would not be possible for all Parties to fulfil all the requirements of the monitoring strategy.

V. FURTHER WORK

60. Mr. Raes informed the Task Force about the ACCENT programme (a network of excellence within the EU replacing EUROTRAC) and how the Task Force and EMEP work would fit in. The main topics of interest for ACCENT were atmospheric sustainability, transport and transformation, biosphere-atmosphere exchange and aerosols. Further information on ACCENT was available from the ACCENT project office (michela@uniurb.it).

61. The Task Force agreed to hold its sixth meeting in spring 2005. The following specific topics were identified for discussion at that meeting: source-receptor relationships and the EURODELTA intercomparison results; CITY-DELTA and downscaling; the review of the MSC-E models.

62. The Task Force proposed to hold a workshop during the autumn of 2004 on the implementation of the EMEP monitoring strategy, to be hosted by CCC in Norway. Furthermore, a proposal was made to hold a workshop on the review of the MSC-E models on heavy metals and POPs in the autumn of 2005, to be hosted by MSC-E in Moscow.

63. Discussion of the relationship between regional and global air pollution with O₃, PM, Hg and POPs was identified for the work-plan of the Task Force in 2006.