



Economic and Social Council

Distr.
GENERAL

ECE/EB.AIR/GE.1/2008/4
ECE/EB.AIR/WG.5/2008/7
23 June 2008

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

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

Steering Body to the Cooperative Programme for Monitoring and Evaluation
of the Long-range Transmission of Air Pollutants in Europe (EMEP)

Thirty-second session

Geneva, 8–10 September 2008

Item 5 (f) of the provisional agenda *

Working Group on Strategies and Review

Forty-second session

Geneva, 1–5 September 2008

Item 3 of the provisional agenda **

INTEGRATED ASSESSMENT MODELLING

Report by the Chair of the Task Force on Integrated Assessment Modelling and the secretariat

INTRODUCTION

1. This report describes the results of the thirty-fourth meeting of the Task Force on Integrated Assessment Modelling, held from 8 to 9 May 2008 in Madrid, in accordance with item 2.3 of the workplan approved by the Executive Body at its twenty-fifth session (ECE/EB.AIR/91/Add.2). It describes progress made with regard to integrated modelling and

* ECE/EB.AIR/GE.1/2008/1.

** ECE/EB.AIR/WG.5/91.

scenario development as well as the experiences of national integrated modelling groups. The presentations made during the meeting and the reports presented are available at:

www.unece.org/env/tfiam.

2. Fifty-three experts from the following Parties to the Convention attended the meeting of the Task Force: Belarus, Belgium, the Czech Republic, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Serbia, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland. Also present were representatives from the EMEP* Centre for Integrated Assessment Modelling (CIAM), the Meteorological Synthesizing Centre-West (MSC-West) of EMEP, the Expert Group on Techno-economic Issues, the Oil Companies' European Organization for Environment, Health and Safety (CONCAWE), the Union of the Electricity Industry (EURELECTRIC), the European Commission's Joint Research Centre (JRC) and the European Environmental Bureau (EEB). A member of the UNECE secretariat also attended.

3. Mr. R. Maas (Netherlands) chaired the meeting, which was hosted by the School of Industrial Engineering at the Technical University, Madrid. Mr. J. Pérez (Vice-Director of the School of Industrial Engineering) and Mr. I. Pasto (Deputy Director-General in the Spanish Ministry of the Environment and Rural and Marine Affairs) opened the meeting.

I. OBJECTIVES AND INTRODUCTORY REMARKS

4. The Chair noted that the meeting's purposes were: (a) to discuss the work required to the revision of the 1999 Gothenburg Protocol[†]; (b) to assess of the progress achieved with respect to integrated modelling and scenario development; and (c) to learn from the new network on national integrated assessment modelling. He drafted the Task Force's timeline of work for the revision process, which was envisaged to be finalized in the end of 2009.

5. The Task Force expressed the need for updated emission projection submissions, in particular from countries outside the European Union (EU) that had not ratified the Gothenburg Protocol. The Task Force agreed that scenario analysis would use the PRIMES model data for EU Member States unless the Party submitted its updated projection to CIAM. Such updated projections should be consistent with climate policies and other relevant policies, e.g. on agriculture and biomass production. The Task Force expressed a serious concern that the use of national projections, which was inconsistent with climate policies, would not be an equal basis for negotiation. All Parties in the EMEP modelling domain should therefore update their

* The Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe.

[†] The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone.

projections to be consistent with climate policies. Some expressed their concern that while they would be able to submit energy and activity projections compatible with climate change policies, the given timetable to provide these to CIAM by the proposed deadline of September 2008 would not be possible to meet.

6. Mr. M. Johansson (UNECE secretariat) outlined the conclusions from the twenty-fifth session of the Executive Body, drawing attention to the requests related to the revision of the Gothenburg Protocol. The Task Force noted that aspirational targets for 2050 and the development of new policy-relevant indicators, e.g. for biodiversity change, required collaboration with the Working Group on Effects and other bodies under the Convention.

7. The Chair presented the main conclusions and recommendations from the Workshop on integrated modelling of nitrogen held from 28 to 30 November 2007 in Laxenburg, Austria. He drew special attention to the recommendations for new work on reactive nitrogen under the Convention. The Task Force noted that this work should: (a) identify information requirement of various policy processes dealing with nitrogen, e.g. the European Union (EU) Nitrates Directive, to avoid pollution swapping and enable integrated assessment modelling; (b) make full use of existing work of the Convention; and (c) advise how various policy targets could be met in a cost-effective way.

8. The Task Force recommended that improving the nitrogen budget calculations should be a priority task to achieve a full balance and to properly understand the sources, sinks and flows of nitrogen, e.g. at the country level.

9. The Task Force on Integrated Assessment Modelling will be represented and participate actively in the first meeting of the new Task Force on Reactive Nitrogen, to be held from 21 to 23 May in Wageningen, Netherlands.

II. SCENARIO DEVELOPMENT

10. Mr. M. Amann (CIAM) presented the progress made in the revision of the EU National Emission Ceilings (NEC) Directive. He explained the assumptions used in the work, including the PRIMES modelled energy pathway, which was consistent across the EU Member States and with the proposed climate and energy package of European Commission, the proposed Integrated Pollution Prevention and Control (IPPC) Directive, and the environmental objectives using indicators and ambition levels from the Thematic Strategy for air pollution (TSAP) and the methodologies used under the Clean Air for Europe programme (CAFE). The projections include estimates on transboundary emissions trading for selected sectors, the use of emission credits outside the EU via the flexible mechanisms under the Kyoto Protocol, and the trading of permits for renewable energy to achieve the overall EU target on the share of renewable energy at least cost. With these assumptions the updated baseline scenario will achieve a significant part of the ambition level for environmental improvements that has been established by the TSAP. The Task Force on Integrated Assessment Modelling noted that the flexible instruments in the

climate and energy package of the European Commission would create an additional uncertainty in the national projections of emissions of energy related air pollutants. This would call for additional uncertainty analyses.

11. The Task Force noted that in the optimization additional reduction efforts were largely driven by health effects of particulate matter (PM). The costs of the air pollution strategy were considerably lower than without the climate and energy package. For all 27 EU Member States, emission reductions were not close the maximum feasible technical reductions, and for ozone, additional measures would not require beyond what is assumed in the baseline. The conclusions from the work were found robust according to the sensitivity analysis on exogeneous policy assumptions. It was noted that to meet the targets set in TSAP for ecosystem protection it had been necessary to revert back to the earlier modelling used at that time, ignoring the differential rates of deposition on different types of ecosystem. In effect, this will underestimate the unprotected ecosystem area.

12. The Task Force took note of the timeline for European Commission work, which had planned to publicize the details on the revision proposal before this summer. Negotiations with the EU Member States and the European Parliament would be held later in 2008, to reach agreement on a common position of the EU.

13. In the ensuing discussion, the environmental targets used in the EU work were discussed in relation to the work for the revision of the Gothenburg Protocol. The Task Force noted that while it was important to include recent findings and tools in the negotiations of the revision of the Gothenburg Protocol, consistency with earlier agreed aims and ambition levels would be important so as to maintain the momentum of the policymaking process.

14. The Task Force noted that the Convention's Executive Body had invited the Working Group on Effects to consider further quantification of policy-relevant effects indicators such as biodiversity change and to link them to the integrated modelling work, and urged that this work be initiated and carried out in collaboration with the Task Force. It noted further that the critical loads for nutrient nitrogen partly function as indicators for the risk of biodiversity change. The links between exceedance and observations should be further clarified during 2008 and the potential of other additional indicators should be explored.

15. Mr. Amann then presented emission control potentials in countries that were not EU Member States. The Gothenburg Protocol had not proven to be an effective tool in reducing emissions in these countries. Even where national legislation on controls existed, its full implementation might be hindered. The Task Force noted that a few selected low-cost measures would already lead into significant emission reductions in non-EU countries. The Task Force was concerned about the poor quality of current data and projections for some of these countries. It recommended that all Parties, in particular those which had not recently updated their energy and activity pathways, submit new data by September 2008 to CIAM.

16. Mr. Amann presented the findings of work with the GAINS model application to Asia. The Task Force noted that in Asia the use of solid fuel in households was an important source for both indoor and outdoor pollution. Well-selected measures to improve local air quality in short term can also deliver co-benefits on greenhouse gas emissions in developing countries. Large increases in national carbon dioxide (CO₂) emissions were expected, and low-cost measures for CO₂ reduction were available. There appear to be good possibilities for industrialized countries to obtain CO₂ emission credits under the Clean Development Mechanism of the Kyoto Protocol.

17. The Task Force took note of ongoing work by several Parties to develop national air pollution scenarios that were consistent with recent climate change and agricultural policies. No Party had yet finalized such scenarios, and few were planning to have coherent scenarios by autumn 2008. Some Parties indicated that differences still existed between national model estimates and the data in the PRIMES and GAINS models. Agricultural projections taking into account envisaged changes in the Common Agricultural Policy of the EU, might also imply significant differences in emissions from earlier national projections being used by International Institute for Applied Systems Analysis (IIASA).

III. DEVELOPMENT IN RELATED AREAS

18. Ms. L. Tarrasón (MSC-West) presented progress made in estimating air quality and deposition in non-EU countries. Uncertainties in European emissions, defined as differences between official and non-official expert estimates, were found to be the largest in the Eastern Europe, Caucasus and Central Asia (EECCA) region. They ranged from 5 per cent for sulphur dioxide to 60 per cent for PM_{coarse} (PM_{2.5}–PM₁₀), mainly due to the wrong allocation of emissions across activity sectors. Differences in emissions affect concentration and deposition values and also the exceedance of critical loads. There were not enough measurements in the area to establish the validity of emission data. The Task Force noted that the uncertainties in emission data from EECCA countries were considerable and their validation was difficult. Reduction of the uncertainty in emission inventories was a prerequisite for integrated assessment modelling work. The Task Force also noted the need for more measurements and further training and guidance of experts from EECCA countries.

19. Mr. F. Dentener (JRC) presented progress achieved in hemispheric transport modelling. The major findings can be found in the UNECE publication, *Hemispheric transport of air pollution 2007 – UNECE Air Pollution Studies No. 16*. Modelled boundary conditions of air pollutant concentrations taken from a single model may include a bias and the results from several models could reduce the uncertainty. The Task Force agreed to request advice from the Task Force on the Hemispheric Transport of Air Pollution regarding which modelled boundary conditions for air pollutant concentrations could be used in its integrated assessment modelling work.

20. The Chair presented, on behalf of Mr. J.-P. Hettelingh (Coordination Centre for Effects (CCE)), the results from the new 2007/2008 call for data on modelled and empirical critical loads, including the Natura 2000 areas of EU as receptor areas, and dynamic modelling data on eutrophication. He drew particular attention to the robustness evaluation of exceedance using an ensemble assessment of impacts. The Task Force took note of the preliminary results of the new call for data and recognized that methods and data had been significantly extended in comparison to those available for the Gothenburg Protocol.

21. The Task Force recommended that CCE and CIAM collaborate to include the most recent data on critical loads in the GAINS model as soon as possible for analysis. It also encouraged both centres to include new effects-oriented elements such as empirical critical loads and dynamic modelling in scenario analysis.

22. The Task Force further noted that the revision of European air pollution reduction policies would benefit from the latest scientific methods and data developed under the effects-oriented programmes of the Working Group on Effects. It also requested CCE and the Working Group to propose policy-relevant indicators, such as biodiversity change, based on this new knowledge.

23. Mr. T. Pignatelli (Co-Chair of the Expert Group on Techno-economic Issues) presented the ongoing work on combustion plants, including emerging technologies, emission limit values (ELVs) for nitrogen oxides from stationary engines, and other tasks requested at the forty-first session of the Working Group on Strategies and Review. The Task Force noted that the main goal was to find any new potential technologies and measures that would have an impact on the abatement potential in the integrated assessment.

IV. OTHER INTEGRATED ASSESSMENT MODELLING ACTIVITIES

24. Ms. H. ApSimon (United Kingdom) and Mr. S. Åström (Sweden) presented the work of the network for national integrated assessment modelling (www.niam.scarp.se). Its second meeting had been held on 7 May 2008, back-to-back with the Task Force meeting. It focused on national integrated assessment modelling results relating to technical and non-technical emission control measures. Abatement was mainly related to energy and transport sources, but also included agriculture. Results from the report on an ex-post evaluation of the Gothenburg Protocol from the country perspective, presented by Mr. J. Lumbreras (Spain), indicated that generally the expected growth in energy use had proven to be slightly overestimated, except for countries where immigration had been underestimated. The implementation of the emission limit values for vehicles proved to be less effective than expected, which forced several Parties to formulate additional abatement measures that were originally not part of a cost-effective solution.

25. The Task Force noted with appreciation the network's recommendations to focus on policy-related topics, in particular the links between air quality and climate change, the emissions from biofuels in the transport sector, and the abatement costs from other than technical end-of-the-pipe measures. Points of attention also included atmospheric modelling and its downscaling and non-linearities in the emissions and effects of reactive nitrogen.
26. Ms. R. Van Dingenen (JRC) presented a globally coherent impact assessment of air pollution of ozone and PM₁₀ for Europe and Asia. It employed selected health response functions and an urban increment factor for PM₁₀. The results indicated that additional reduction measures would be needed to avoid excessive adverse health impacts, mainly due to PM₁₀.
27. Ms. A. Kuhn (Germany) presented the EU project, INTARESE (Integrated Assessment of Health risks of Environmental Stressors in Europe), which develops and applies integrated assessment methods for environmental health risks, including an Internet-based guidance system. She also introduced another EU project HEIMTSA (Health and Environment Integrated Methodology and Toolbox for Scenario Assessment), which develops and applies integrated assessment models on current and future health impacts in Europe due to environmental pollution. She then described the project, PAREST (Particulate Matter Reduction Strategy), which identified cost-efficient strategies to reduce the PM burden in Germany.
28. Mr. R. Friedrich (Germany) presented work on integrated assessment of heavy metals and persistent organic pollutants (POPs) in EU project, ESPREME. In the assessment of benefits of abatement measures, the co-benefits for reduction of PM played a dominant role. Heavy metals and PM often required the same abatement techniques. Deposition of lead and chromium might pose a significant risk via sewage sludge used to fertilize arable land.
29. Mr. R. Guardans (Spain) presented work on the implementation of the Stockholm Convention on POPs and the potential role of integrated assessment modelling. He stressed that long-term cooperation and reporting obligations, common databases, and shared models and scenarios were factors for success in international conventions.
30. Mr. J. Olivier (Netherlands) presented energy security policies in an integrated cost-benefit analysis with local air pollution and global climate change policies. A joint approach would put more emphasize on biofuels, clean coal technologies and the development of other low-carbon electricity production techniques.
31. Mr. M. Barrett (United Kingdom) presented the costs and health benefits of reducing emissions from power stations in Europe. Less than 100 large power plants caused more than 80 per cent of the health risks from electricity production in Europe. The benefits of abatement techniques outweighed the costs. Data on large combustion plants and the European pollutant emission register were still not comparable.

V. FURTHER WORK

32. The Task Force agreed to specify in more detail the following selected workplan items for 2008:

(a) To explore non-binding “aspirational” targets for the year 2050 for emission scenarios and effects, a workshop was tentatively scheduled to be held in the end of 2008, in connection with the thirty-fifth meeting of the Task Force. Cooperation would be sought with the Task Force on Emission Inventories and Projection, the Expert Group on Techno-economic Issues, the Working Group on Effects, the European Environmental Agency and invited experts from the climate change community;

(b) For the second phase of the GAINS model review, to be carried out in collaboration with the European Commission, model documentation would be made available online in autumn 2008 to inform Parties and get feedback from them.

33. The Task Force discussed its possible activities in 2009. Scenario development and uncertainty and robustness analysis would be the main activities of the Task Force and CIAM in 2009. A workshop was envisaged in collaboration with the European Commission on the review of the GAINS model.

34. The Task Force agreed to collaborate with the Working Group on Effects on the preparation of a proposed status report on airborne nitrogen impacts. It took note of the preparation of draft Guidelines on reporting of monitoring and modelling air pollution effects of the effects-oriented programmes, which could help in constructing policy-relevant indicators to be linked to integrated assessment modelling. The Task Force also agreed to collaboratively explore possibilities to include the dynamic aspects on effects in its analysis, in particular for the years 2020 and 2050.

35. The Task Force recommended that the bodies under the Working Group on Effects inform their national focal points on the new network of National Integrated Assessment Modelling and its national focal centres. It encouraged the points and centres to get in touch with each other to enhance links between effects-oriented and integrated assessment work within the countries.

36. The Task Force discussed its outreach activities with air pollution prevention activities, organizations and processes outside the Convention area. It took note of the participation of Mr. Amann (CIAM) in a meeting of Air Pollution Information Network for Africa (APINA) in March 2008 in Lusaka. CIAM has also participated the atmospheric transport model intercomparison work in Asia (the Asian Model Intercomparison Study (MICS), coordinated by the network centre of the Acid Deposition Monitoring Network in East Asia (EANET)) and has applied the GAINS model methodology to other parts of the world, e.g. in India and China. The

Task Force had also exchanged experiences with modellers working for the Stockholm Convention on POPs.

37. The Task Force explored potential future outreach activities. It noted that modellers were prepared to participate in information exchange with other international conventions where appropriate. The Task Force noted, in relation to the Malé Declaration[‡], which it would be open to proposals to collaborate and to make its knowledge and findings available, where appropriate, and preferably through the EMEP Steering Body.

38. The Task Force agreed to encourage Parties to use direct bilateral contacts with EECCA countries on integrated assessment modelling and emission projections. CIAM invited EECCA experts to communicate improved emission projections. The Task Force would be appreciative if CIAM report 1/2008 on emission scenarios for non-EU countries could be translated into Russian.

39. The Task Force agreed on its draft 2009 workplan:

(a) Contribution to the revision of the Gothenburg Protocol, including aspirational environmental targets and related abatement, links to structural changes and climate change and analysis uncertainties and robustness (Task Force on Integrated Assessment Modelling, CIAM, Parties, Network for National Integrated Assessment Modelling);

(b) Collaboration with the Task Force on Reactive Nitrogen, in particular on the avoidance of pollution swapping (Task Force on Integrated Assessment Modelling, CIAM, Parties);

(c) Collaboration with the Task Force on the Hemispheric Transport of Air Pollution, in particular on boundary conditions and future hemispheric emissions (Task Force on Integrated Assessment Modelling, CIAM, Parties);

(d) Collaboration with the Working Group on Effects, in particular on additional analyses of ecosystem effects by CCE using emission scenarios from the GAINS model, on using dynamic models and on the development of policy-relevant indicators, including those for biodiversity (Task Force on Integrated Assessment Modelling, CIAM, Working Group on Effects);

(e) Proceed with the second phase of the GAINS model review in collaboration with the European Commission (Task Force, CIAM);

[‡] Malé Declaration on the Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia.

(f) Hold the thirty-sixth meeting of the Task Force on Integrated Assessment Modelling in May 2009;

(g) Hold a workshop on the second phase of the review of the GAINS model, tentatively at the end of 2009;

(h) Hold the thirty-seventh meeting of the Task Force, tentatively scheduled to be held in the end of 2009;

(i) Submit appropriate reports to the EMEP Steering Body and the Working Group on Strategies and Review.
