



**Economic and Social
Council**

Distr.
GENERAL

EB.AIR/WG.5/2003/6
7 July 2003

ORIGINAL: ENGLISH

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

Working Group on Strategies and Review
(Thirty-fifth session, Geneva, 16-19 September 2003)
Item 5 on the provisional agenda

AIR POLLUTION CONTROL TECHNOLOGIES AND COSTS

Prepared by the Chairman and members of the
Expert Group on Techno-economic Issues in consultation with the secretariat

Introduction

1. This report presents progress made in the past four meetings held in the context of the Expert Group on Techno-economic Issues: a meeting of the steering group of the Expert Group (23 January 2003); a workshop on the techno-economic database (3 April 2003); a meeting of the Expert Group (4 April 2003); and a joint meeting of the Expert Group on Techno-economic Issues and the Expert Group on Ammonia Abatement (11-12 June 2003). The minutes and presentations will be made available on the web site of the Expert Group on Techno-economic Issues
http://www.citepa.org/forums/egtei/egtei_index.htm

Documents prepared under the auspices or at the request of the Executive Body for the Convention on Long-range Transboundary Air Pollution for GENERAL circulation should be considered provisional unless APPROVED by the Executive Body.

I. THE MEETING OF STEERING GROUP OF THE EXPERT GROUP ON TECHNO-ECONOMIC ISSUES (23 JANUARY 2003)

A. Participation and objectives of meeting

2. The steering group of the Expert Group on Techno-economic Issues met on 23 January 2003 in Paris to clarify the objectives and a timetable for its work. The meeting was organized by the Interprofessional Technical Centre for Studies on Atmospheric Pollution (CITEPA) and the French-German Institute for Environmental Research (IFARE). Representatives of the French Agency for Environment and Energy Management (ADEME) and the French Ministry of Ecology and Sustainable Development were present. Experts from France, Italy and the United Kingdom participated in the meeting, as well as the Chairman of the Working Group on Strategies and Review and a member of the secretariat. A representative of the Centre for Integrated Assessment Modelling (CIAM) was present. Mr. R. Bouscaren (France) chaired the meeting.

3. The steering group clarified that the main tasks of the Expert Group were: (a) to provide an overview of available information on the costs of technologies for controlling air emissions; and (b) to provide relevant data to CIAM to be used in the Regional Air Pollution Information and Simulation (RAINS) model for integrated assessment modelling and the development of cost curves under the Convention. The data would additionally be used to develop baseline scenarios needed for the European Commission's Clean Air for Europe (CAFE) programme.

4. It was confirmed that 19 Parties had nominated experts to the Expert Group. Mr. R. Ballaman, Chairman of the Working Group on Strategies and Review, said he hoped to see nominations of experts by other Parties in the coming months. He underlined the importance of the Expert Group agreeing on priority sectors for the techno-economic database, as well as on the timing for data delivery to CIAM, given the constraints of CAFE.

5. The steering group discussed the progress made in the development of the techno-economic database, intended to provide average European costs and default values for emission reduction techniques by source. It also discussed plans for a workshop to introduce the database system to national experts. Cooperation with industry was highlighted as an important part of the work of the Expert Group, and further participation from industry representatives was encouraged. (A list of industry associations working with the Expert Group will be circulated as an informal document).

B. Cooperation with the Centre for Integrated Assessment Modelling

6. According to the steering group, the Expert Group was working closely with CIAM to ensure compatibility of data with the RAINS model. Mr. M. Amann (CIAM) noted that it was important to agree on priority sectors, as well as rules for the aggregation of data.

7. The steering group agreed the following priority sectors for the initial construction of the techno-economic database: non-methane volatile organic compound (NMVOC) emission sources covered by the European Commission's Solvent Directive; paint use; industrial processes (with an emphasis on controlling particulate matter); small boilers in the residential and commercial sector (particulate matter from wood combustion); the off-road transport sector; and industrial combustion.
8. Ms. N. Allemand (CITEPA) noted that sector-specific meetings to assess reduction techniques by source had been held in Paris, as follows: solvent uses/chemical industry (4 November 2002); petroleum industry/distribution of fuels (5 November 2002); iron and steel/non-ferrous metals (28 November 2002); mineral products (29 November 2003); off-road transport (16 December 2002); combustion/incineration (17 December 2002). The minutes and documents can be found at: http://www.citepa.org/forums/egtei/egtei_index.htm. While no further sector-specific meetings were planned for 2003, a series of smaller meetings devoted to specific sources of emissions would be organized. These meetings would include industry representatives in order to achieve consensus on representing sectors and defining costs.
9. The steering group confirmed that the Expert Group would prepare for CIAM a background document of default values on costs of control technologies for reference installations in priority sectors. The database of default values would be disseminated by CD-ROM to all participating Parties for validation and thereafter delivered to CIAM. The default values would include emission factors, cost data, application rates of technology, and uncertainties. Data on atypical installations would be added at a later date. The data validation process would also include quality control and consistency checks by CITEPA and IFARE, and thereafter by CIAM, which would point out discrepancies or technical inconsistencies to Parties.
10. It was agreed that all reference documents on source categories would be completed by 31 May 2003, while the final versions of the database and software tool would be completed by 15 June 2003. Final data would be delivered to CIAM by the end of 2003 so that baseline scenarios could be prepared for CAFE by January 2004.
11. The steering group agreed to organize a workshop to demonstrate the software tool and its methodology and use, and to present default data to national experts (see below).

II. WORKSHOP ON METHODOLOGY AND USE OF TECHNO-ECONOMIC DATABASE (3 APRIL 2003)

12. A workshop on the methodology and use of the software tool and techno-economic database was held on 3 April 2003 in Paris. The workshop was organized by CITEPA and IFARE, in cooperation with ADEME. Experts from Belgium, Finland, France, Georgia, Italy, Latvia, Netherlands, Norway, Romania, Sweden and the United Kingdom participated in the workshop. A

representative of CIAM and a member of the secretariat were also present. Mr. R. Bouscaren chaired the workshop.

13. The objective of the workshop was to introduce to national experts the software tool and techno-economic database developed by consultants working with the Expert Group. Mr. B. Calaminus (IFARE) presented the main characteristics of the software tool as well as the procedures to be followed by national experts in collecting country-specific data.

14. Mr. M. Ball (IFARE) demonstrated how to use the database, which was intended to collect information on costs and other parameters related to reference installations and control technologies for emission reduction. Using three sample sectors (power plants, printing and glass), he showed how the software provided increased reliability and transparency of data, as well as an ability to trace records, including documentation on the origin of data, rules for aggregation, and comparison with default data. Emission abatement techniques were divided into primary and secondary techniques, while abatement efficiencies were calculated relative to removal efficiencies. Emission factors (mean values) were assigned for unabated emissions and abated emissions. Abated emission factors were calculated based on the uncontrolled case, using a combination of techniques.

15. Hands-on computer training was offered to participants to familiarize them with the system. Mr. Ball pointed out the limitations of the database, noting it was not intended to provide marginal costs of reduction, costs per ton of pollutant, or to indicate remaining control potential. The system would be improved to make it more user-friendly.

16. The software tool would enable experts to describe their national abatement situation and compare sector-specific values with the system's default values. Once data were validated at agreed levels of aggregation, they would be transmitted to CIAM for use in RAINS. Modelling results would then be used by CIAM to generate cost curves, and could eventually be used by the Expert Group when considering revisions to the technical annexes to protocols to the Convention.

17. The workshop recognized that activity data, and especially projected activity data, had proved difficult for Parties to produce, but it emphasized that these were important in developing baseline scenarios, for weighting the relative costs of technologies and the relative share of a given type of installation in each country.

III. MEETING OF THE EXPERT GROUP ON TECHNO-ECONOMIC ISSUES (4 APRIL 2003)

18. Following the workshop on the software tool, the Expert Group met on 4 April 2003, in Paris. The meeting was organized by CITEPA and IFARE. Experts from Belgium, Finland, France, Georgia, Italy, Latvia, Netherlands, Norway, Romania, Sweden and United Kingdom participated. Representatives of ADEME and the French Ministry of Ecology and Sustainable

Development as well as a representative of the European Commission and a representative of CIAM attended the meeting. A member of the Bureau of the Working Group on Effects and a member of the secretariat were also present. Mr. R. Bouscaren chaired the meeting.

19. The aim of the meeting was to assess the progress made in the development of the techno-economic database and to agree on parameters for defining costs. The Expert Group recalled that its steering group had proposed priority sectors as defined by CIAM and priority pollutants, taking into account the largest sources of sulphur, nitrogen oxides, NMVOCs and particulate matter.

20. Mr. R. Farret (France), representing the Bureau of the Working Group on Effects, noted that the air pollution effects experts faced problems similar to those targeted by the Expert Group, e.g. presenting technical data for integrated assessment modelling and scenarios used by CAFE, and urged cooperation between the Expert Group and the effects experts.

A. Parameters used in the techno-economic database

21. The Expert Group discussed the parameters to be used in the database, including investment costs, fixed operating costs, catalyst costs (including catalyst volume per unit of installed capacity, unit costs of catalysts and lifetime of catalysts), interest rates, energy prices and technical lifetime of a reference installation. The cost of waste disposal may also be included. It was noted that fuel switching as an abatement measure implied a change in prices.

22. An important parameter used in the database system was the application rate of technology, i.e. the degree to which a given control technology can be applied to a given reference installation. When experts provided information on a given control option, they should also provide estimates of application rates. The representative from CIAM confirmed that the Centre had default application rates, but hoped to verify these with the rates applied nationally.

23. Mr. R. Maas, Chairman of the Task Force on Integrated Assessment Modelling, said that the Task Force, as well as the Network of Experts on Benefits and Economic Instruments, had decided to use the parameter "technical lifetime", instead of "economic lifetime"; energy prices with taxes and a discount rate of 4 per cent. He encouraged the use of these parameters also for the techno-economic database. The techno-economic database provided default values for each of these indicators, and Parties could choose to accept them, or provide their own figures. A consistency check discouraged experts from providing values that were outside a specified range, and the database provided room for comments or explanations. As not all sectors would be relevant for each Party, experts were recommended to focus on the most important sectors in their country.

24. The Expert Group discussed which parameters should be country-specific, sector-specific or installation-specific. The list of parameters and their agreed ranges and treatment in the

database can be found in the minutes of the meeting:

http://www.citepa.org/forums/egtei/egtei_index.htm.

B. Organization of data and timetable for future work

25. The Expert Group discussed the role of national experts and procedures for providing information for the techno-economic database. Reference documents on each of the priority sectors were made available on the web site of the Expert Group, with a deadline of two weeks for national experts to send their comments. Experts were expected to consult with industry and their national administrations to obtain the values required for the database, as specified in the reference documents, and to input the data into the system.

26. Mr. J. Cofala (CIAM) clarified that in the cases where data were not supplied by countries, or were incomplete or unreliable, default values or expert estimates would be used. It was agreed that CIAM would contact the European Commission to assess the technical and political feasibility of postponing the finalization of the baseline scenario to the end of 2003.

27. Given the need for updating the RAINS model with information on the agricultural sector, it was agreed to convene a joint meeting of the Expert Group on Techno-economic Issues and the Expert Group on Ammonia Abatement, inviting representatives of the agriculture and nature panel of the Task Force on Emission Inventories and Projections to take part (for results of the joint meeting, see below).

28. It was agreed that the next meeting of the Expert Group on Techno-economic Issues would be held in Paris in November 2003. It would assess the progress made in obtaining data from national experts and approve delivery of data to CIAM for integrated assessment modelling.

IV. JOINT MEETING OF THE EXPERT GROUP ON TECHNO-ECONOMIC ISSUES AND THE EXPERT GROUP ON AMMONIA ABATEMENT (11-12 JUNE 2003)

29. The Expert Group on Techno-economic Issues met jointly with the Expert Group on Ammonia Abatement on 11-12 June 2003 in Paris. The meeting was organized by CITEPA and IFARE. Experts from Belgium, Czech Republic, Denmark, France, Germany, Italy, Latvia, Netherlands, Poland, Spain, Switzerland and United Kingdom participated in the meeting. Representatives of the panel on agriculture and nature of the Task Force on Emission Inventories and Projections also attended, as well as the Chairman of the Working Group on Strategies and Review and a member of the secretariat. Mr. R. Bouscaren chaired the meeting and Mr. J. Webb (United Kingdom), as the newly appointed Chairman of the Expert Group on Ammonia Abatement, co-chaired. The Meeting thanked Mr. Davidson, the former Chairman of the Expert Group on Ammonia, for his contribution to the work of the Expert Group.

A. Update on the work of the Expert Group on Techno-economic Issues

30. Mr. R. Ballaman, Chairman of the Working Group on Strategies and Review, recalled that, in accordance with article 10 of the 1999 Gothenburg Protocol, reviews of the Protocol should take into account “best available scientific information on the effects of acidification, eutrophication and photochemical pollution” as well as “progress made on the databases on emissions and abatement techniques, especially related to ammonia and volatile organic compounds”. He reminded the Expert Groups that the first such review should commence no later than one year after the Protocol entered into force. Since the review process would most likely involve the updating of the technical annexes, it would be important to consider technologies that may be used beyond 2010, as well as energy, transport and agriculture baseline scenarios up to 2020.

31. Ms. B. Wachs of the secretariat informed the Meeting on the status of ratification of the Gothenburg Protocol, as of 1 June 2003. As the Protocol had only four ratifications, it was unlikely to enter into force in 2004 as originally expected. This meant that the review process, which included input from the Expert Group on Techno-economic Issues, would take place at a later date. This would give the Expert Group ample time to consider the updating of the technical annexes to the Protocol and reflect not only the state of the art in abatement techniques, but also emerging technologies and future assumptions.

32. Ms. N. Allemand (CITEPA) noted the difficulties in completing the validation of techno-economic data provided by national experts. It would be necessary to rely on default values for non-responding Parties to a greater extent than was originally foreseen. Involvement by industry would help reach consensus on costs and on the representation of each sector, as well as on types of reference installations and applicable control technologies.

B. Update on the work of the Expert Group on Ammonia Abatement and the agriculture and nature panel of the Task Force on Emission Inventories and Projections

33. Mr. J. Webb reminded the meeting that the objectives of the Expert Group on Ammonia Abatement were: to continue to revise the Guidance Document on Control Techniques for Preventing and Abating Emissions of Ammonia (EB.AIR/1999/2, chap.V); to promote the use of the Framework Advisory Code of Good Agricultural Practice for Reducing Ammonia Emissions (EB.AIR/WG.5/2001/7); to further examine estimates of non-agricultural ammonia emissions, in collaboration with the Task Force on Emission Inventories and Projections and the Task Force on Measurements and Modelling; to improve the quality of reporting ammonia emissions and measurements; and to review, in cooperation with the Task Force on Measurements and Modelling, strategies to monitor decreases in nitrogen compounds.

34. Mr. U. Daemmgen (Germany), Chairman of the agriculture and nature panel of the Task Force on Emission Inventories and Projections, noted that the objectives of the panel were to provide comprehensive guidance and technical information for the construction of national emission inventories related to agriculture and nature. The current focus of the panel was on updating the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook with regard to emission factors, in particular chapters 10 01 (cultures with fertilizers) and 10 02 (cultures without fertilizers), 10 04 (enteric fermentation), 10 05 (manure management regarding organic compounds), 10 06 (pesticides and limestone) and 10 09 (manure management regarding nitrogen compounds). He indicated that, due to a lack of help in kind, no progress on updating of information related to stubble burning and emissions of primary particles had recently been made.

35. National experts from Denmark, Netherlands, Poland and Spain and United Kingdom described ammonia abatement techniques used in their countries. Available presentations will be made accessible at: http://www.citepa.org/forums/egtei/egtei_index.htm and <http://www.unece.org/env/lrtap/wg/aa>.

C. Agricultural sector in the RAINS model

36. Mr. Z. Klimont (CIAM) presented the RAINS model, noting the need for better information on agriculture. He stressed that RAINS was based on the concept that cost-effective air pollution abatement in Europe required an integrated approach, including economic development, projections of energy use, state of emission controls, available technologies, costs and atmospheric processes, as well as information on environmental sensitivities, as indicated by critical loads and levels. He emphasized the importance of the work of the Expert Group on Techno-economic Issues to improve the data used in RAINS and gave an overview of the structure of the agricultural sector and data needs of RAINS.

37. The issue of the cost of controlling emissions of ammonia from agriculture was brought up by a number of speakers. Mr. Z. Klimont presented an overview of cost calculations in the RAINS model and stressed the importance of reviewing and updating the cost data used, paying special attention to feasibility of certain measures at small farms as well as transferability of cost estimates (investments and operating costs) between countries. Mr. M. Ryan (United Kingdom) presented a proposed methodology to estimate the costs of abatement measures in agriculture and introduced a concept of 'affordability', an issue that might be critical for many farmers.

38. Mr. Klimont noted the main features of agricultural projections in the European Union included: a steady decline in dairy cattle; an increase in the production of pork and eggs; a continuing decrease in mineral N fertilizer use; and strong improvements in production efficiency. The main features of agricultural projections for accession countries included: a further reduction in cattle herds; a slight recovery of pork and poultry production; and a continuing growth in mineral N fertilizer use since 1995. CIAM needed more information on the implementation of

abatement techniques in the agricultural sector. Through the process of validating submissions both to the Convention and under the European Commission's National Emission Ceilings (NEC) Directive, CIAM would conduct a comparison of activity and emission data, using historical and projected data. Additionally, a trend analysis and gap-filling exercise was being performed by the European Topic Centre on Air Climate Change (ETC/ACC), using the same data sets. Results would be presented to the Task Force on Emission Inventories and Projections at its next meeting in Warsaw (22-24 September 2003).

D. Actions proposed at the joint meeting

39. The Meeting welcomed the work by CIAM to fill statistical gaps and improve the quality of reporting on ammonia emissions and measurements. It identified the need for more detailed information on agricultural practices, including animal housing and manure management, and noted that CIAM proposed to circulate a questionnaire to selected Parties. The questionnaire, which would be prepared jointly with the Expert Group on Ammonia Abatement and the agricultural and nature panel of the Task Force on Emission Inventories and Projections, would ask Parties for basic information on agriculture and animal husbandry such as nitrogen and carbon excretion and herd size.

40. The Meeting identified a need for a workshop to assist countries with economies in transition in agricultural emission abatement options. It might be held in spring 2004, depending on the support from a host country. The Working Group on Strategies and Review may wish to decide if this workshop would be held in place of, or in addition to, the annual meeting of the Expert Group on Ammonia Abatement.

41. The need for improving inventories of agricultural emissions and non-agricultural ammonia emissions was underlined. It was suggested that the Task Force on Emission Inventories and Projections might devote a portion of the agenda of its next meeting to this.