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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 of Air Pollutants in Europe

Working Group on Effects

First joint session*
Geneva, 14–18 September 2015
Item 4 (b) of the provisional agenda
Progress in emissions inventories and other emissions-related issues: improvement of emission data

Emission inventories and projections**

Report by the co-Chairs of the Task Force on Emission Inventories and Projections

Summary

The mandate of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) Steering Body is to provide sound scientific support to the Convention on Long-range Transboundary Air Pollution, inter alia, in the area of emission inventories and emission projections (see ECE/EB.AIR/68, annex III, appendix III). To help EMEP to fulfil that mandate, the Task Force on Emission Inventories and Projections is tasked with reporting annually to the EMEP Steering Body to provide a summary of its progress, as well as policy-relevant

* The Executive Body to the Convention agreed that, as of 2015, the Working Group on Effects and the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe should meet jointly, to achieve enhanced integration and cooperation between the Convention's two scientific subsidiary bodies (ECE/EB.AIR/122, para. 47 (b)).

** The present document is being issued without formal editing.

messages and recommendations (ECE/EB.AIR/122/Add.2, item 1.4.7).

In line with that mandate, the present report reflects progress made and conclusions agreed at the twenty-eighth meeting of the Task Force (Milan, 11–14 May 2015) in accordance with the 2014–2015 workplan for the implementation of the Convention (ibid., items 1.4.5, 1.4.6, 1.4.7, 1.5.1 and 3.4)

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I. Introduction

1. The Task Force on Emission Inventories and Projections (TFEIP) under the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) assists EMEP in providing sound scientific support to the Convention on Long-range Transboundary Air Pollution (Convention) in the area of emission inventories and emission projections. The work of the Task Force is organized and led by the co-Chairs, Mr. C. Dore (United Kingdom of Great Britain and Northern Ireland), Mr. M. Adams (European Environment Agency (EEA)) and Ms. K. Saarinen (Finland). In addition, expert panel leaders coordinate work relating to emissions in four specific technical areas, namely: (a) combustion and industry; (b) transport and mobile machinery; (c) agriculture and nature; and (d) emission projections. The focus of this work is to support the Convention's Parties in reporting air pollutant emissions and projections data, including capturing relevant information for maintenance and improvement of the *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA Guidebook).[1]

2. The co-Chairs and expert panel leaders held a management and planning meeting on 11 February 2015. The workplan of the Task Force was reviewed, and planning was undertaken for the Task Force's annual meeting.

3. The annual meeting constitutes the Task Force's main annual output. The conclusions and recommendations agreed by the Task Force at that meeting are detailed in the following sections of this report.

II. 2015 annual meeting of the Task Force

A. Organization and planning

4. The twenty-eighth meeting of TFEIP was held on 11 and 12 May 2015 in Milan, Italy. The meeting of the Task Force, which is a subsidiary body of the United Nations Economic Commission for Europe (UNECE) Convention, was held jointly with a meeting of the EEA European Environment Information and Observation Network (EIONET). It was followed by a scientific workshop on 13 and 14 May, held jointly with the United States Department of Energy (DOE) and the Environmental Protection Agency (US-EPA), which presented the latest research findings and the work on black carbon (BC) emissions estimates and modelling, and abatement technologies. Conclusions from the joint workshop are presented in the annex to this report. Presentations and documents from the Task Force meeting and from the workshop are available online.[2]

5. The three co-Chairs jointly chaired the meeting and expert panel leaders chaired the technical sessions in the four defined technical work areas (see para. 1).

B. Attendance

6. Over 150 participants registered for the annual Task Force meeting, representing 49 countries as well as international organizations, including the EMEP Centre on Emission Inventories and Projections (CEIP), the Task Force on Measurements and Modelling

[1] See http://www.eea.europa.eu/publications/emep-eea-guidebook-2013.
[2] Available from http://www.tfeip-secretariat.org/meetings/.

(TFMM), the Task Force on Reactive Nitrogen (TFRN), and the European Commission. EEA was represented by several members of its staff as well as by staff from its European Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM). Several representatives from industry also attended.

7. The United States funded the participants from Russia and Eastern Europe, the Caucasus and Central Asia to attend the workshop. This enabled them to also attend the preceding meeting of the Task Force.

C. Review of related work under the Convention

8. The UNECE secretariat provided information on recent developments under the Convention, and the Co-chairs presented the TFEIP's contributions to recent EMEP Steering Body and Executive Body sessions, in particular on adjustments guidance. A representative of the European Commission provided an update on the Clean Air Policy Package,[3] and explained that negotiations are on-going between the Commission, EU Member States and the European Parliament.

9. The co-chairs highlighted that the TFEIP has established an improved dialogue with some groups within the Convention. Resource constraints have however meant that it has not been possible to strengthen links with the Task Force on Measurements and Modelling to date, but this was now identified as a priority item by the chairs of both groups who will explore opportunities for joint cooperation.

D. Emissions reporting and quality, scientific reviews and adjustment reviews

10. The representative of CEIP presented a summary of the emissions reporting in 2015. The TFEIP was pleased to note that all but one Party used the new NFR2014 reporting templates in the first year of reporting under the revised Guidelines for reporting emissions and projections data under the Convention (EC/EB.AIR/125), and that 25 Parties voluntarily reported emission estimates for black carbon.

11. However, some significant quality problems remain evident in the reported emissions data. This has been a persistent issue with submissions over past years, and the Task Force stressed the importance of reporting emissions data of sufficient quality. The co-chairs will raise this issue at the first joint session of EMEP Steering Body and the Working Group on Effects in September 2015.

12. The European Environment Agency's ETC/ACM has undertaken an assessment of the existing scientific review processes ("Stages 1, 2 and 3") for emissions inventories within the Convention, and the findings were discussed. The TFEIP concluded that the Stages 1 and 2 reviews do perform an important quality assurance/ quality control (QA/QC) check on submitted national emissions inventory datasets, even if the checks performed may not always be a key driver for emissions inventory improvement by Parties. Also, whilst there is scope for improving the checks, this is limited by the detail of reported information. It was noted that the outputs from Stages 1 and 2 are not commonly used in the Stage 3 reviews.

[3] See http://ec.europa.eu/environment/air/clean_air_policy.htm.

13. The importance of the Stage 3 review process was widely recognised, but it was concluded that the current 5-yearly review was wholly inadequate in driving and assessing inventory improvement. There was support for the potential review frequency to be informed by the quality of the emissions inventory for a particular Party. It was also agreed that a follow-up process should be put in place to ensure that recommendations were being adequately addressed by Parties. The TFEIP agreed that the co-chairs would raise this issue at the first joint session of EMEP Steering Body and the Working Group on Effects, and would undertake a review of the 2007 "Methods and procedures for the technical review of air pollutant emission inventories reported under the Convention and its protocols" (ECE/EB.AIR/GE.1/2007/16) together with CEIP, and if necessary, would present a proposed update at the May 2016 TFEIP meeting.

14. The co-chairs provided an update on the status of the adjustments guidance, including the decisions made by the Executive Body (December 2014). Comments on the existing guidance had been received from Parties, and revisions were agreed by the TFEIP, to be undertaken by the co-chairs.

E. The EMEP/EEA air pollutant emission inventory guidebook

15. 2016 is a triennial update year for the EMEP/EEA Guidebook, and preparations are already underway for this task.

16. The European Commission are funding a project which will deliver updated information and chapters for incorporation into the EMEP/EEA Guidebook. A representative of the European Commission and the project team provided a summary of the project workplan, and highlighted in particular the interaction with the TFEIP. The TFEIP thanked the European Commission for supporting the development of the Guidebook, and agreed to support the project as resources allowed. Detailed discussions were included in the expert panel sessions.

17. The TFEIP agreed to form ad hoc groups as required to review the draft Guidebook chapters provided by the European Commission's project team. The updated guidebook will be presented for technical approval at the May 2016 TFEIP meeting, with a view to its subsequent endorsement by the second joint session of EMEP Steering Body and the Working Group on Effects in September 2016.

F. Emissions from combustion and industry

18. A number of technical presentations were given, including: the outcomes of a workshop on gridding emissions organised by the Emissions Database for Global Atmospheric Research (EDGAR) team, substantially increased emission estimates from wood combustion in Italy, and approaches for spatially disaggregating mercury emissions in Poland.

19. Discussions with representatives from the European Solvents Industry Group continued. Industry emission estimates continue to be lower than national inventory estimates, and work is on-going to identify the reasons for this.

20. The European Commission's Guidebook project team presented the approach that is planned for tasks relating to small-scale combustion, particulate matter (PM) emission factors and sulphur oxides/sulphur dioxide (SO_X/SO_2) and black carbon metrics. The TFEIP agreed to contribute to the data collection stage of the project as resources allowed.

G. Emissions from road transport and non-road mobile machinery

21. It was noted that the Guidebook chapter on non-road mobile machinery (NRMM) has been updated, but progress on the guidance for speciation of non-methane volatile organic compounds (NMVOCs) and polycyclic aromatic hydrocarbons (PAHs) has been limited due to resource constraints. A new version of the COPERT transport emissions model is planned for 2016 and is being undertaken by the EEA's ETC/ACM.

22. Eurocontrol presented details of their aviation emissions model, and the JRC presented information on new eco-innovation technologies to reduce carbon dioxide (CO_2) emissions from road vehicles.

23. The European Commission's Guidebook project team presented the approach that is planned for updating guidance on NRMM. A number of challenges were identified, and the TFEIP offered to support the work as resources allowed.

H. Emissions from agriculture and nature

24. The European Commission's Guidebook project team presented the approach and progress to date on updating numerous parts of the agriculture chapters in the Guidebook. The TFEIP is working closely with the project team, offered input for the data collection stage of the project, and will support the project as resources allow.

25. The literature on ammonia (NH_3) emissions from fertilizer has been revisited and a revised methodology is under development. Consultation with specific modellers is planned as part of the updates on NH_3 emissions from standing crops.

26. Agricultural and "semi-natural" emission factors for indirect emissions of nitrogen oxide (NO) and nitrous oxide (N_2O) were compared and improvement work planned. NH_3 emissions from biogas that fall within the agriculture sector were considered, and methodology development planned.

I. Emissions projections

27. Outcomes from a recent report from the EEA on 'Projections in hindsight' showing the wide variations in past reported projections for 2010 were discussed, and it was concluded that Parties need to report more supporting information with emission projections to improve transparency regarding methodologies and uncertainties.

28. The Projections chapter of the EEA/EMEP Guidebook will be updated to: provide best practice on reporting supporting information with projections data, explain the importance of providing sensitivity analysis scenarios, and to include information on national emission projection systems.

J. Sharing of good practice

29. Finland presented the way in which the national inventory incorporates information from point sources into the national emissions inventory. The TFEIP discussed several examples of good practice.

30. Spain presented results from a project that undertook an extensive measurement campaign of emissions from biomass use in household/residential stoves. Results included emission estimates from a range of pollutants, the fractionation of PM into OC and EC, and potential chemical markers for the biomass combustion contribution to PM.

K. European Environment Information and Observation Network

31. Representatives from EEA and its ETC/ACM provided several presentations outlining recent project work and activities relevant to EIONET in general, including on:

(a) The latest news on EEA and EIONET related activities;

(b) Results from a recently published report assessing past emission projections reported by Member States under EU air pollution and greenhouse gas legislation;

(c) A short summary of reporting issues encountered in the compilation of the 2015 EU LRTAP Convention emissions inventory.

L. Other business

32. The Task Force thanked Parties for supporting the Task Force's work, and in particular the EU (via EEA), Finland and the United Kingdom.

33. The Task Force also expressed its sincere appreciation to their hosts: the EU Joint Research Council, Regione Lombardia and ARPA Lombardia, and thanked EEA for providing financial support to allow EIONET representatives to participate in the meeting.

M. Future work

34. The Task Force reviewed the existing workplan, and actions arising from the meeting. A number of actions were agreed, with priority items being:

1. Standing items:

(a) Holding of an annual Task Force meeting and workshop to support development of the EMEP/EEA Guidebook and share best practice;

(b) Acting as a focal point for technical discussions through several different communication channels (including the use of different Internet resources);

(c) Promoting and supporting work that provides updated information for use in the EMEP/EEA Guidebook by sourcing data from the literature and liaising with other projects, Task Forces and centres within the Convention as resources allow.

2. Other core work programme items:

(a) Work with EMEP to find a practical solution to the on-going resource issues associated with: Maintaining the EMEP/EEA Guidebook, resourcing the Stage 3 scientific reviews of emissions inventories, resourcing the adjustment compliance reviews of emissions inventories;

(b) Undertake a full "version" update of the EMEP/EEA Guidebook for 2016, including the provision of support to the project team undertaking the European Commission project;

(c) Update of the adjustments guidance with comments provided by Parties and as instructed by the Executive Body;

(d) Review the need for updating document ECE/EB.AIR/GE.1/2007/16 on the Methods and Procedures for emission inventory reviews, and present the findings at the 2016 meeting of the TFEIP.

(e) Improve outreach and working with other Convention Task Forces and centres, and in particular: set up a joint work group with the TFMM, liaise with EMEP Meteorological Synthesizing Centre-East (MSC-E) and the Meteorological Synthesizing Centre-West (MSC-W), and support the secretariat's initiative to deliver capacity building to countries in Eastern Europe, the Caucasus and Central Asia, as resources allow.

3. Aspirational work items

35. These are currently unfunded, and will be compiled and circulated as the Guidebook Maintenance and Improvement programme. This will include compiling new and/or updated guidance for a range of sources, and a task to improve the emissions reporting from countries of Eastern Europe, the Caucasus and Central Asia.

Annex

Conclusions of the workshop of the Task Force and the European Environment Information and Observation Network on improving black carbon emissions estimates and abatement

1. The Task Force's 2015 workshop, which focused on the methods currently used for estimating emissions of black carbon (BC), was held on 13 and 14 May 2015, following the annual meeting. Presentations highlighted the latest information from the scientific community and provided discussion on how to align BC definitions. The workshop was supported by the US Department of Energy, the US Environmental Protection Agency, The European Commission's Joint Research Centre, Regione Lombardia and the Environmental Protection Agency (ARPA) of Lombardia.

I. Day 1

2. The workshop was opened by a representative of the US Department of Energy (DOE), outlining the policy context for BC reporting, and summarising recent initiatives under the Arctic Council and the Convention.

3. Finnish Environment Institute (SYKE) provided a review of the state of science and the latest work being conducted under the Arctic Council and the International Institute for Applied Systems Analysis (IIASA) Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model.

4. Presentations were given on two modelling programmes on Arctic deposition of BC from the US DOE and the University of Tennessee.

5. Presentations were given on BC speciation, specifically the definitions and uses of the terms BC, EC (elemental carbon) and OC (organic carbon). The UK presented on ongoing work to update the EMEP/EEA Guidebook for compiling BC emission inventories.

6. Presentations were given on emission technology and abatement controls for BC emissions from representatives of: (a) Task Force on Techno-Economic Issues, (b) IIASA, (c) EDF Energy and (d) SRI Atmosphere (Russia).

7. Presentations were given on methods for estimating and reducing BC emissions.

8. Day 1 ended with a facilitated discussion led by the US DOE. Specific sectors were considered as being most important in terms of delivering future research and understanding. This included measurement data from small/medium boilers and understanding of BC emissions from gasoline / petrol road vehicles. Future links and collaboration between the Convention and other research groups was encouraged. It was suggested that a specific web page be added through the Task Force or CEIP websites to allow relevant links to recent/ongoing BC research to be shared.

9. Options for improving the EMEP/EEA Guidebook were discussed (should resources be available) and suggestions included:

(a) To include BC emissions methodology for natural sources;

(b) To develop and include BC speciation profiles as appendices to sector chapters;

(c) To provide clarity and definition of BC and the speciation used for existing emission factors;

(d) To check the current emission factors for gas flaring, and the supporting text.

II. Day 2

10. The morning of day 2 focused on the latest emission estimates being developed and reported by individual Parties and regions. Presentations were given on: (a) The status of reporting under the Convention, (b) an update on the Nordic Short Lived Climate Pollutants project, (c) the US EPA BC inventory and (d) Russian BC inventory.

11. A speaker from Carbon Limits gave a presentation focusing on emissions of BC and technology options in the oil and gas sector.

12. A closing discussion session encouraged Parties to continue developing inventories and measurement programmes for BC where possible. The Secretariat noted that they were encouraged by the high level of reporting for the first year of voluntary reporting under the Convention.

13. Options for including BC as part of the annual EMEP inventory review process were discussed, but not considered appropriate at this stage.

14. Concern was again raised due to the lack of a consistent definition for BC. Some measurements are being made for BC (by optical classification) whereas some are for EC (thermal classification). It was the view of some participants that there could be future consistency problems if a common understanding is not reached, although it was also noted by meeting participants that the uncertainties arising from differences in technical definition of BC will be outweighed by the general uncertainties arising from BC measurement, modelling and emission inventory uncertainty.