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Item 6 (c) of the provisional agenda

Progress in activities in 2014 and future work: emissions

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 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-seventh meeting of the Task Force (Ghent, 12–14 May 2014) 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 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 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 22 October 2013. 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. 2014 annual meeting of the Task Force

A. Organization and planning

4. The twenty-seventh meeting of the EMEP Task Force on Emission Inventories and Projections was held on 13 and 14 May 2014 in Ghent, Belgium. The meeting of the Task Force, which is a subsidiary body of the United Nations Economic Commission for Europe (ECE) Convention on Long-range Transboundary Air Pollution (Air Convention), was held jointly with a meeting of the EEA European Environment Information and Observation Network (EIONET). It was preceded by a scientific workshop on 12 May, held jointly with EIONET, which presented the latest research findings and the work of the Parties on estimating emissions from non-road mobile machinery and small-scale combustion sources. 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 130 participants registered for the annual Task Force meeting, representing 39 countries as well as international organizations, including the EMEP Centre on Emission Inventories and Projections (CEIP), the Centre for Integrated Assessment Modelling

¹ See <http://www.eea.europa.eu/publications/emep-eea-guidebook-2013>.

² Available from <http://www.tfeip-secretariat.org/meetings/>.

(CIAM), the Meteorological Synthesizing Centre-East (MSC-E), the Meteorological Synthesizing Centre-West (MSC-W), the Task Force on Reactive Nitrogen, 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 co-Chairs noted that unfortunately there was no representation from countries of Eastern Europe, the Caucasus and Central Asia, the lack of funding being the main barrier cited by national representatives. The Task Force co-Chairs have already held discussions with the secretariat about the possibility of making funding available to support the attendance of experts from countries of Eastern Europe, the Caucasus and Central Asia in the Task Force's annual meeting in 2015.

C. Review of related work under the Convention

8. The co-Chairs informed participants about recent work associated with revisions and amendments to the three latest protocols to the Convention, and in particular the work of the EMEP Steering Body and the Executive Body in adopting changes to the reporting requirements relating to emissions. The Task Force was disappointed to note that the original proposal it had put forward to bring reporting requirements up to the level of scientific good practice had not been adopted. The Task Force noted that, as a direct consequence, there would continue to be cases where the ad hoc requests of the Implementation Committee for scientific review of specific submissions could not be addressed.

9. The co-Chairs presented the revisions to the emissions reporting requirements in detail. The Task Force noted that the reporting cycles for projections and gridded data were no longer aligned, and considered that a missed opportunity for streamlining.

10. The co-Chairs explained that the Executive Body had adopted a procedure for the review of adjustment applications reliant on voluntary expert contributions from the Parties. They explained that the first round of adjustment reviews in 2014 would be monitored, and conclusion passed back to the EMEP Steering Body with the aim of identifying and implementing improvements to the review process.

11. The co-Chairs noted that several countries had applied for an adjustment, and that those applications would be reviewed as a priority over the annual stage 3 scientific reviews, assuming sufficient resources.

12. The co-Chairs presented the agreed 2014 Nomenclature for Reporting (NFR14) source categorization for reporting emissions, and explained that the main driver for change was to retain consistency with the changes being implemented to greenhouse gas reporting requirements under the United Nations Framework Convention on Climate Change (UNFCCC). The Task Force was reminded of a "formats conversion" file, and the co-Chairs indicated that an updated version to support Parties would be circulated shortly after the meeting.

13. The co-Chairs highlighted that it was important for members of the Task Force to better liaise with national representatives attending the EMEP Steering Body and Executive Body meetings to ensure that technical guidance from the scientific community was properly reflected within the Convention.

D. 2014 emissions reporting and review

14. The representative of CEIP presented a summary of the emissions reporting in 2014. The Task Force was disappointed to note that reporting of emissions data and Informative Inventory Reports (IIRs) had decreased since 2012. The co-Chairs had repeatedly encouraged communication from those Parties to establish how the Task Force could try to facilitate support that directly delivered improvements to reported emissions data and IIRs.

15. CEIP noted that the stage 3 emissions inventory review process was not receiving enough support from Parties to allow complete review teams for the reviews in 2014. In addition, for the 2014 cycle there was the additional burden associated with reviewing adjustment applications, so some of the scheduled stage 3 reviews might need to be postponed until next year. The co-Chairs reflected on the fact that repeated requests for support had not solved that issue, and proposed that alternative approaches be considered and forwarded to the EMEP Steering Body.

16. A representative from the European Commission presented the latest information on its proposed new Clean Air Policy Package³ that includes the proposal for a revised National Emission Ceilings Directive. The details were currently under negotiation, and were expected to be finalized in 2015–2016. The co-Chairs noted that there were strong links between the Task Force and the work of the European Commission and they would work to ensure that that continued.

E. Needs of the modelling community

17. The Task Force has continued to build links with the modelling community, and presentations were given regarding the latest modelling developments at MSC-W and MSC-E. The modellers also indicated their priorities for improving the reported emissions data. The low levels of completeness in the eastern part of the EMEP area were highlighted as a main shortcoming. The requirement for comprehensive point source data was also explained. MSC-E specifically asked that, within the persistent organic pollutants (POPs) and heavy metals technical area, improvements to the accuracy and completeness of cadmium and dioxins and furans emissions be made a priority. The Task Force requested that national inventory programmes to take those priorities into account when compiling their inventory improvement programmes.

18. A representative from EEA presented recent work from the remote observation scientific community, which demonstrated that there were improved links between the emissions inventory community and the Earth observation community. Those links would become important as more of those data were used in emissions inventory compilation and verification.

F. Emissions from combustion and industry

19. Discussions with the representatives from the European Solvents Industry Group (ESIG) continued from previous meetings on the emissions from solvents. Industry emission estimates continued to be lower than estimates from national inventories, and the Task Force continued to work with ESIG with the aim of identifying the reasons for observed differences.

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

20. The group of experts working on POPs emissions provided an update on their work to date. The group would continue to collate information on national POPs studies to support the development of the EMEP/EEA Guidebook.

21. In response to the presentation of the European Commission on its new National Emission Ceiling Directive proposal, a discussion was held on the different definitions of “sulphur” emissions, i.e., reporting of sulphur oxides (SO_x), sulphur dioxide (SO₂) or all sulphur (S) compounds as SO₂. It was recognized that there was a clear need to ensure harmonization of the definitions used in different protocols/directives. The Task Force stressed the importance of reporting emissions of all sulphur compounds calculated as SO₂ to ensure consistency with the EMEP/EEA Guidebook (and hence all of the emissions guidance which underpinned the emission estimates in the Convention) and to ensure consistency with the reporting under the UNFCCC and the National Emission Ceilings Directive⁴ of the European Union (EU) (which also refer to the EMEP/EEA Guidebook for calculating sulphur emissions). The Task Force further questioned what benefits would be delivered by requiring SO₂ emissions to be additionally reported as compared with the current practice of reporting only SO_x under the Convention.

22. Wood combustion emission factors (EFs) in the current version of the EMEP/EEA Guidebook were noted to include inconsistencies. If resources could be made available, development work would be undertaken to improve the information in the Guidebook.

23. Most countries were currently using a Tier 1 approach for small combustion sources, even where best practice indicated a Tier 2 or better approach should be used. Proposals were made on ways to support Parties in improving their methodologies, should resources be available.

24. The group also discussed how particulate matter (PM) should be defined, and therefore what measurement methods should be used to determine EFs. Assuming available resources, existing EFs would be reviewed to allow a more detailed description of the origin of the data to be included in the EMEP/EEA Guidebook.

25. It was agreed that the co-Chairs of the Task Force should inform the EMEP Steering Body of the technical discussions regarding the definition of PM and the impacts the different definitions made on national emission estimates, and should request that the Steering Body provide guidance to the Task Force on which metric should be used for future guidance and emissions reporting.

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

26. With regard to emissions from non-road mobile machinery, the EUROCONTROL⁵/EEA data set on aviation movements was expected to be made available by September-October 2014.

27. There were currently some large discrepancies between bunker fuel and activity data statistics for marine transport activities. However, an EU Measurement, Reporting and Verification system would come into force in 2018 that might create improved availability of maritime data at the EU level.

28. There was a clear need to improve the Tier 1 and Tier 2 non-road mobile machinery EFs in the current version of the EMEP/EEA Guidebook, and to extend the Tier 3 guidance

⁴ Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants.

⁵ See <https://www.eurocontrol.int/>.

to include new control technologies. Assuming available resources, work would be undertaken to collate information and support updates to the Guidebook.

29. Presentations were also given on a number of research projects whose outputs would be considered for contribution to the EMEP/EEA Guidebook. Data on newer technologies were also now available, and guidance would be drafted for incorporation into the Guidebook in due course.

30. Furthermore, potential updates of the computer programme to calculate emissions from road transport (COPERT) model⁶ were being considered and an updated draft of the road transport chapter of the EMEP/EEA Guidebook was presented. Comments on the chapter were invited following the meeting, following which the chapter would be published.

H. Emissions from agriculture and nature

31. With regard to emissions from agriculture and nature, the Task Force discussed current guidance on estimating emissions of ammonia from fertilizer. The literature would be revisited and the calculation of EFs for the EMEP/EEA Guidebook would be refined.

32. Ammonia emissions from standing crops and residues were considered, and it was concluded that discussion with the modelling community was needed. It was confirmed that there was a source category for that source, and therefore emissions should be included in national totals. Updating the Guidebook would depend on resource availability.

33. Feedback was also provided on the most recent meeting of the Task Force on Reactive Nitrogen. The Task Force on Emission Inventories and Projections already had strong links with that Task Force, and would work to ensure they were maintained.

34. A new online tool developed within the “An integration of mitigation and adaptation options for sustainable livestock production under climate change” (AnimalChange),⁷ an EU-funded project for estimating ammonia and black carbon (BC) emissions, was presented, including an assessment of the advantages and disadvantages compared with current methodologies and tools.

35. The emissions estimation methodology for biogas production in Germany was presented. It was agreed that the emissions from digesters should be reported in the energy sector. Some EFs for digestate application might need to be developed in due course. That would be considered for future work programmes.

36. It was noted that some restructuring of the EMEP/EEA Guidebook was needed for methodologies regarding emissions from agricultural soils to facilitate the ease of locating information. That would be undertaken if financial resources could be found.

37. Discussion would be opened with the modelling community to collate information on NMVOC speciation methodologies and nitrogen oxide (NO_x) emissions from soils.

38. It was agreed that there was a need to retain harmonization of reporting between the Convention and the revised EU Directive on National Emission Ceilings, particularly in the agriculture sector. The Task Force would notify the Steering Body of their views on that matter.

⁶ See <http://www.emisia.com/copert/Documentation.html>.

⁷ See <http://www.animalchange.eu/>.

I. Emissions projections

39. It was concluded that technical definitions within the emissions projections technical area need to be better communicated, so that policy colleagues had a fuller understanding of what the data represented. The Task Force would support national representatives in working towards that goal.

40. The lack of transparency in the PRIMES energy system model⁸ was considered to be a continuing issue. The Task Force would endeavour to liaise with the PRIMES model managers to seek solutions to that.

41. In addition, a request would be made to CEIP to draft templates to allow the reporting of POPs and heavy metals projections, as none currently existed.

42. If resources could be found, guidance on estimating emission projections for BC would be added to the Guidebook.

J. Emissions methodology developments

43. CEIP presented the findings from a recent project to estimate emissions across the new 0.1° x 0.1° EMEP grid. New SO_x and NO_x maps were presented.

44. The co-Chairs encouraged Parties to report gridded data on the new EMEP grid before the next formal reporting round in 2017, to benefit from discussions with CEIP regarding the data. CEIP welcomed Parties wishing to discuss reliability of the current mapping proxy data sets, as well as using them to support national work on mapping emissions.

45. The Task Force noted that, according to the revised Guidelines for Reporting Emissions and Projections Data under the Convention (ECE/EB.AIR/125), after 2017, data might still be submitted using the 50 kilometre (km) x 50 km grid if it was not yet “technically or economically feasible” to migrate to the new EMEP grid. However CEIP clarified that they had converted their information system to work on the new grid, and so any data reported in the old grid system could not be used by the modelling community.

46. Germany presented information on the recent revision to mercury emission estimates in Germany. The presentation clearly illustrated the benefit of verification studies using different data sets and understanding the quality of the input data used in emission inventories.

47. The United Kingdom gave a presentation on the use of new data visualization tools to review and compare emissions data, and support the activities of inventory compilers and reviewers. It was requested that those data and tools be made available. The co-Chairs would investigate whether it was possible to find funding to allow for that.

48. The Netherlands explained that coastal measurements indicated the presence of a marine source of ammonia. The impact of emissions on coastal areas had been shown, but a fully causal calculation methodology had not yet been developed.

⁸ See

http://www.e3mlab.ntua.gr/e3mlab/index.php?option=com_content&view=category&id=35:primes&Itemid=80&layout=default&lang=en.

K. European Environment Information and Observation Network

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

(a) The new EEA multi-annual work programme and planned activities in the area of air pollutant emissions, including EIONET input to the European Environment State and Outlook Report 2015 and proposed changes to EEA priority data flow evaluation for emissions data that were subsequently agreed with EIONET representatives;

(b) The new EEA work area of industrial pollution, including information on future options for large point source reporting;

(c) Reporting issues encountered in the compilation of the 2013 EU Air Convention emission inventory, and the need to improve completeness of member State reporting, in particular in the early years of the time series.

L. Other business

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

51. The Task Force also expressed its sincere appreciation to the Flemish Environment Agency, Bruxelles Environnement (the Brussels Region Environment Agency) and the Walloon Air and Climate Agency for hosting the meeting, and thanked EEA for providing financial support to allow EIONET representatives to participate in the meeting.

M. Future work

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

(a) *Standing items:*

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

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

(iii) 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 task Forces and centres within the Convention as resources allow;

(iv) Encouraging participation in, and support of, both the stage 3 and adjustment reviews;

(b) *Specific initiatives:*

(i) Reviewing and improving the information available on emissions from small-scale stationary combustion sources and the use of mobile machinery to improve the information currently in the EMEP/EEA Guidebook (should resources be available);

(ii) Providing information to the EMEP Steering Body that explains the technical difficulties which arise from the current lack of a precise definition of PM and ensuring that this information clearly presents the implications relating to compliance assessment;

- (iii) Supporting the scientific community in working closely with the national representatives who attend the Executive Body meeting, to ensure that there is sufficient understanding of the benefits of the proposals being submitted by the emissions inventory community;
- (iv) Informing Parties that within heavy metals/POPs reporting, improvements to cadmium and dioxins and furans reporting should be prioritized;
- (v) Reviewing the success of the first round of the adjustment reviews, while seeking new solutions to the ongoing issue of the under-supported stage 3 reviews, and passing conclusions and recommendations to the EMEP Steering Body for consideration.

Annex

Conclusions of the workshop of the Task Force and the European Environment Information and Observation Network on emissions from mobile machinery and small-scale stationary combustion

1. The Task Force's 2014 workshop, which focused on the methods currently used for estimating emissions from mobile machinery and small-scale stationary combustion, was held on 12 May 2014, just prior to the annual meeting. Presentations highlighted areas that require development and the latest information from the scientific community.

I. Mobile machinery

2. The current status of the guidance in the EMEP/EEA Guidebook was given, highlighting the areas requiring development.

3. Croatia, Belgium and Germany explained how emissions from mobile machinery were estimated in their countries. Areas of best practice were highlighted, as well as parts of the inventory which require further development or improved input data.

4. Some Guidebook updates were required; in particular, the Task Force agreed that the Tier 2 methodology needed to be updated with emission factors and information on the split of activity data to different sources for years after 2010. In addition, for the Tier 3 methodology, emission factors needed to be updated with measured values and information on new technologies added. That would be included as a priority item in the Task Force work programme, but would only be possible if resources can be arranged.

5. It was concluded that collating information from country-specific studies on emissions from mobile machinery would be helpful as a first step in determining whether there were common findings across countries, and therefore whether additional guidance could be included in the EMEP/EEA Guidebook such as indicators, resolving stationary and mobile sources within sectors, etc.

6. Information from detailed national case studies would be collated and reviewed. Findings would be reported at the 2015 Task Force meeting.

II. Small-scale stationary combustion

7. The current status of the guidance on emissions from small-scale stationary sources in the EMEP/EEA Guidebook was presented, highlighting some specific areas requiring development.

8. Presentations were given on: (a) the impact of the recent economic downturn on emissions from biomass burning in the Greek residential sector; (b) the methodologies used to estimate emissions from small-scale wood combustion in Finland; (c) emissions from boilers in London; (d) laboratory studies of emissions from burners in Ireland; and (e) emission estimates of short-lived climate pollutants from the Nordic countries.

9. A number of conclusions were reached:

(a) It was agreed that more work was required to better characterize and standardize emission factors, and in particular those from wood combustion. That would be

included in the Task Force workplan as a priority item, and would be undertaken should resources allow;

(b) A request for specific emissions measurements to support the development work in the area of small-scale stationary combustion would be drafted and forwarded to the Task Force on Measurements and Modelling;

(c) Emission factors for solid fuel had not been updated for several years, and should be improved if data from the literature allowed. The Task Force would include emission factors for solid fuel as an item in the workplan that did not have secured funding;

(d) The need for additional guidance on methodologies and input data for the EMEP/EEA Guidebook was discussed (e.g., the fraction of wood burned using good or poor practice, the use of different biomass, etc.). Should resources be made available, research would be undertaken with the aim of adding guidance to the Guidebook in that area;

(e) New technologies were being introduced, and it was therefore important that the Task Force continued to be well briefed on the latest research findings. Efforts would be made to review newly available literature.
