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## 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-Fourth session

Geneva, 13–15 September 2010

Item 6 (c) of the provisional agenda

**Progress in activities in 2010 and future work: emissions**

## EMEP/EEA<sup>1</sup> Air Pollutant Emission Inventory Guidebook Maintenance and Improvement Plan

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

1. At its thirty-second session, the Steering Body of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) invited the Task Force on Emission Inventories and Projections to present “a draft maintenance plan specifying tasks, responsibilities and estimated costs for the [EMEP/EEA Air Pollutant Emission Inventory] Guidebook” (ECE/EB.AIR/GE.1/2008/2, para. 41(f)). A draft plan was prepared and provided to the EMEP Steering Body for its thirty-third session in 2009. The Steering Body welcomed the draft elements of such a maintenance and improvement plan, and invited the Task Force to further elaborate the plan on the basis of the feedback provided during and after the session, prior to presenting it for adoption to the Steering Body at its thirty-fourth session in September 2010 (ECE/EB.AIR/GE.1/2009/2, para. 38 (g)). This report has been compiled for submission to the thirty-fourth session of the EMEP Steering Body, and provides an updated version of the original draft.

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<sup>1</sup> The Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and the European Environment Agency (EEA).

## **I. Introduction**

### **A. The EMEP/EEA Air Pollutant Emission Inventory Guidebook**

2. A recently completed European Commission project delivered an updated version of the EMEP/EEA Air Pollutant Emission Inventory Guidebook (hereafter, the Guidebook). The Guidebook is used as the reference document for estimating air pollutant emissions under the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution. The Guidebook has been adopted by the EMEP Steering Body, and endorsed by the Executive Body of the Convention. According to the Guidelines for reporting emission data under the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/97), Parties shall as a minimum use the methodologies in the latest version of the Guidebook for national submissions under the Convention. Similarly, the European Union (EU) member States are also requested to use the Guidebook under the requirements of the National Emission Ceilings Directive 2001/81/EC.

3. The completion and availability of an updated Guidebook is considered to be a significant step forward in the ongoing aim of EMEP, through the Task Force on Emission Inventories and Projections, to ensure that the most up-to-date information is available to Parties to the Convention. This ensures that national emission estimates submitted under the Convention can comply with the general principles of emissions inventory good practice: transparency, accuracy, completeness, consistency and comparability.

4. Emphasis within the Task Force on Emission Inventories and Projections now moves to ensuring continuous improvement of the Guidebook, and that maintenance is undertaken in line with the most up-to-date results from research work. At its thirty-second session, the EMEP Steering Body “acknowledged the lack of dedicated resources and the absence of a systematic approach for improving and maintaining the Guidebook” and “called upon the Parties to the EMEP Protocol to consider making voluntary contributions to guarantee the provision of up-to-date and good-quality data”(ECE/EB.AIR/GE.1/2008/2, para. 41(f)).

5. This document has been specifically compiled at the request of the EMEP Steering Body to:

- (a) Present and explain the numerous challenges associated with ensuring that the Guidebook is maintained to a satisfactory level of quality;
- (b) Propose a management structure for overseeing effective maintenance of the Guidebook, and consider the practicalities of putting this in place;
- (c) Present the priority technical activities which the Task Force on Emission Inventories and Projections does not currently have the capacity to undertake.

### **B. Structure of this report**

6. Chapter II of this report considers the framework that is required for effective maintenance of the Guidebook and compares this with existing structures.

7. Chapters III–VI present prioritized improvement tasks from the different expert panels within the Task Force, and in particular highlight where important work cannot currently be undertaken by the Task Force for whatever reasons, including insufficient resources.

## **II. A Framework for Guidebook Maintenance**

### **A. Task Force structure and status**

8. The Task Force on Emission Inventories and Projections itself has no legal status, being simply a gathering of respected emission inventory experts. Consequently, the Task Force cannot make decisions in its own right, receive funding, or let contracts. The output from the Task Force takes the form of recommendations to the EMEP Steering Body. As with all other task forces under the Convention, the Task Force on Emission Inventories and Projections relies on in-kind contributions to fund activities and many individual experts have in the past, and still continue, to contribute to the review and update of the Guidebook in this manner.

9. There are several important implications arising from these features of the Task Force:

(a) Committing to ongoing/longer term tasks includes a level of risk, because funding/effort cannot easily be predicted, and certainly not guaranteed;

(b) If/when in-kind contributions are made available, they are usually provided for activities specified by the funding Government/organization. Therefore it is not easy for the Chairs of the Task Force to target efforts to the areas where it is most needed;

(c) If/when in-kind contributions are made available, it is typically to tackle smaller tasks. It is therefore difficult to tackle the larger, more strategic tasks;

(d) It is typically the same small number of countries which make in-kind contributions;

(e) The general lack of funding for ongoing tasks means that some work is typically undertaken by experts on a voluntary basis. Inevitably this work is given lower priority than other, funded, work.

10. So, while the Task Force is an excellent way to access well-respected emission inventory experts, the current structure (in terms of funding arrangements), is not well suited to undertaking an ongoing task as important as the maintenance of the Guidebook.

11. If the Guidebook is to be maintained as a key reference document and source of the most up-to-date information, then long-term stable funding will be needed to complement the expected continuation of the voluntary in-kind contributions from the Parties, as requested by the EMEP Steering Body (see section I.A).

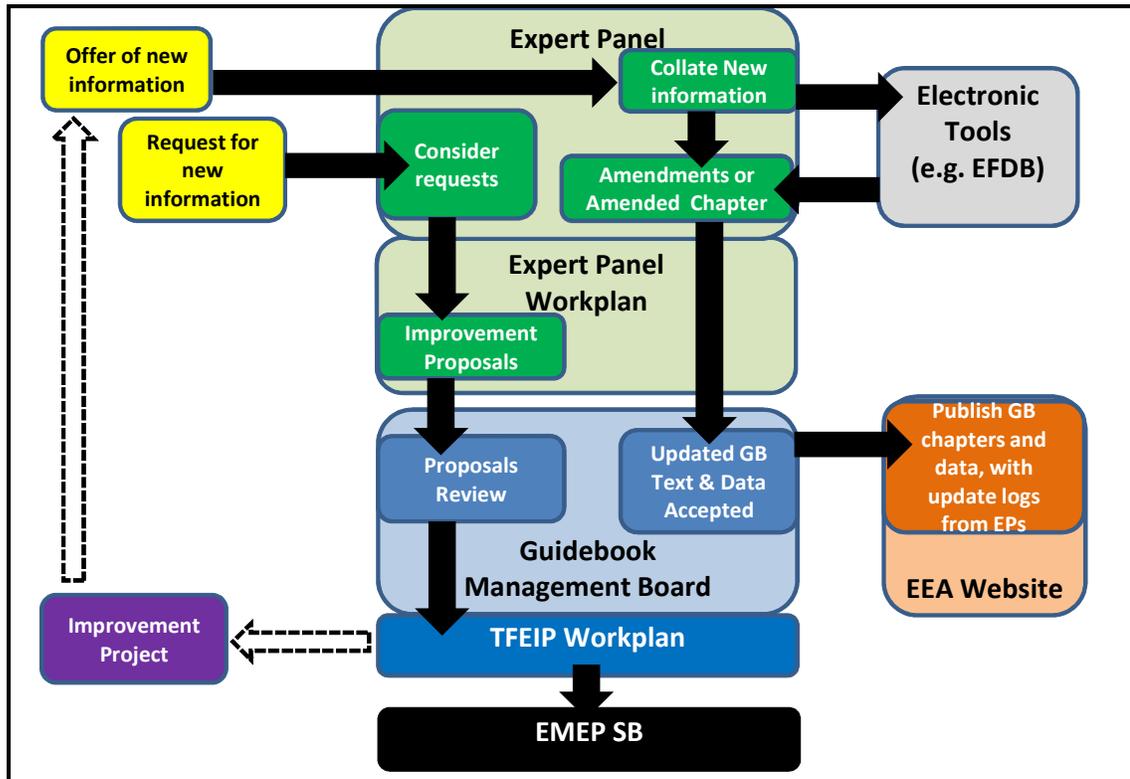
### **B. Host organization**

12. As the Task Force has no legal status a “host” organisation entitled to receive funds and set up contracts for future Guidebook-related work involving management of financial resources would be needed. The EMEP Centre on Emission Inventories and Projections (CEIP), for example, could be one option for a potential host organization, although this does not rule out other possibilities.

### **C. Management structure**

13. Figure 1 below presents an idealized structure for the management of the Guidebook. Many of the data flows are already in place, and the diagram represents a formalization of the process. However, there are also some significant changes, as explained in the following sections.

Figure 1  
Idealized Guidebook management structure



Note: GB = Guidebook; TFEIP = Task Force on Emission Inventories and Projections; SB = Steering Body; EFDB = Emission Factor Database; EP = Expert panel.

**1. Guidebook Triennial Update Cycle**

14. Substantial updates would be made to the Guidebook Chapters every three years. In interim years, expert panels would provide information via their Web pages, which would indicate a list of pending additions/amendments to the Guidebook chapters. In this way the Guidebook could be given some stability (and updates could be undertaken more efficiently), but the most up-to-date information would remain constantly available for those wishing to use it in their emission inventories.

**2. Improvement projects**

15. The Improvement Projects indicated in Figure 1 are research projects designed to address particular Guidebook needs. Ensuring a suitable level of funding for the Guidebook Management Board would allow input into setting the specification of these projects. These projects would provide new data which would feed into the relevant expert panels, and ultimately lead to Guidebook improvements.

**3. Guidebook Management Board**

16. A Guidebook Management Board would be established, consisting of the Task Force Chairs and expert panel leaders. The Board would be responsible for ensuring the effective coordination of the Guidebook maintenance and improvement, and aspects of delivery.

17. However, currently there is very limited funding for the Chairs and expert panel leaders to undertake additional tasks associated with Guidebook activities. As a result, there is limited capacity to incorporate new information into the Guidebook or undertake more strategic tasks. This will need to be addressed if the Guidebook is to be updated and maintained to the levels desired.

#### **4. Guidebook coordination improvement proposal (priority 1): Guidebook Technical Coordinator**

18. It would be very valuable if EMEP were able to include funding for someone to act as the Guidebook Technical Coordinator. The role of the Coordinator would be to:

(a) Support the transfer of information from research projects to the expert panel leaders;

(b) Support the expert panel leaders in incorporating new information into chapters of the Guidebook;

(c) Liaise with the EEA on the practical aspects of Guidebook maintenance, e.g., helping to maintain tools and systems, and generally helping with file and data management.

19. It is estimated that this role would require 20 days of work per year. An easy solution would be to extend CEIP funding to include this role.

20. Following a decision on whether this role can be supported, the Chairs and expert panel leaders will need to collectively review the level of effort that they are able to make available for Guidebook maintenance and improvement tasks. This will need to be done in the context of their roles and competing priorities, and will allow for realistic planning.

### **D. Electronic tools**

21. A number of different electronic tools have been discussed at recent Task Force meetings. It has become clear that particular groups of stakeholders have very different needs. For example, the emission inventory compilers would like a database of the emission factors presented in the Guidebook. However, such a database would need to be consistent with the Guidebook chapters at all times. This would mean an increased burden on the expert panel leaders (who would prefer to be able to edit the text and data of the chapters in a simple direct way).

22. A management system has now been developed which addresses these different needs, and the Guidebook Management Board would need to maintain this.

23. In addition, the Board would need to continue to liaise with activities being undertaken by other organizations. For example, in its role as Guidebook publisher, the EEA are continuing to investigate providing online access to the “official” emission factors from the Guidebook, while Finland is separately developing an emission factor library which includes, among others emission factors, the emission factors from the Guidebook. Maintaining consistency between these different datasets will be very important going forward.

## **III. Combustion and Industry Expert Panel**

24. The combustion and industry expert panel is responsible for a large portion of the sources in the Guidebook. The following summarizes the highest priorities for the Combustion and Industry Expert Panel.

## Guidebook technical improvement proposals

### (a) Updates to Guidebook chapter 3.D: Other solvent use (Priority 1)

25. A workshop in 2010 has shown the need for improved emission estimation methods for the use of solvents, and in particular for the sectors that are now not so well covered by the Guidebook. Categories 3.D.2 and 3.D.3, Domestic solvent use and Other solvent use, respectively, are responsible for a large share of the emissions while methodologies are outdated. The Expert Panel is working together with Norway to try and develop a rather simple method that may be used by other countries to improve their inventory in this sector. This task is estimated to cost approximately €5,000

### (b) Update to Guidebook Chapter 1.A.4: Small Combustion Sources (Priority 1)

26. Sections of the combustion in energy and transformation industries require rewriting to improve the transparency and the reference material. Also a Tier 3 methodology would be developed to evaluate detailed fuel consumption and allocate between sectors and technologies (particularly for Commercial and Public Services and Residential). This work will use the results from the UNECE Expert Group on Techno-Economic Issues work on small combustion installations. This task is estimated to cost approximately €10,000.

### (c) Particulate matter (PM) fugitive emissions (chapters: 1.B.1.a, 1.B.1.b, 2.A.7.a, 2.A.7.b, 2.A.7.c, 2.C.5.f, 6.A) (Priority 1)

27. The Task Force meeting in 2010 provided evidence that a source of particulate matter (PM) rarely assessed, and difficult to assess, is the storage and transportation of solid fuels, raw materials and waste. A general review of methodologies is necessary. Tier 3 methodology needs to be developed and Tier 2 and Tier 1 emission factors have to be derived from Tier 3. This task is estimated to cost approximately €15,000.

### (d) Updates to Guidebook Chapter 1.A.2: Manufacturing Industries and Construction (Combustion) (Priority 1)

28. The industrial chapters require a clear distinction between combustion and process emissions. The current version of the Guidebook has made the choice to attribute emissions to either process or combustion. However, the situation is not always consistent and needs to be improved. It is crucial to have a consistent use of the split between process and combustion emissions in both the combustion-related industrial chapter (1.A.2) and the process-related chapters (NFR 2). Discussion with the industry on how to estimate the emissions can play a key role in this development. This task is estimated to cost approximately €10,000.

### (e) Improve consistency and transparency in combustion and industry chapters (Priority 2)

29. This activity is and will be finalized to:

(a) Ensure consistency of the units of emission factors throughout the Guidebook;

(b) Ensure full consistency of central estimates and confidence intervals across the different tiers;

(c) Improve Guidebook transparency by removing references to documents which in turn refer to previous editions of the Guidebook.

This task is estimated to cost approximately €6,500

**(f) Updates to Guidebook Chapter 1.A.1.c: Manufacture of solid fuels and other energy industries and to Guidebook Chapter 1.B.1.b: Fugitive emissions from solid fuels: Solid Fuel Transformation (Priority 3)**

30. Chapter 1.A.1.c requires revisions to both the emission factors (and the reference list) in a number of different tables. Chapter 1.B.1.b requires revisions to the emission factors and the inclusion of references. This task is estimated to cost approximately €2,000.

**(g) Size distribution of PM before secondary abatement techniques (Priority 3)**

31. This task involves the checking the internal consistency of abated PM emission factors with the before-abatement PM size distribution and the respective efficiencies of particulate reduction. This task is estimated to cost approximately €2,500.

## **IV. Transport Expert Panel**

32. The transport expert panel is in the fortunate position of being involved in steering the deliverables from a number of large projects and ongoing programmes through the European Research on Mobile Emission Sources (ERMES) network. As a result, the panel is quite well served by the research and science community. Of course, due to the significance of the sector and the constant technological developments in the area, some priorities for further improvements have been identified. Many of these have secured funding. Only items which do not have secured funding are included below (and in Annex 1).

### **Guidebook technical improvement proposal**

#### **Improvement of cold-start modelling (Priority 1)**

33. New emission data on the cold-start performance of cars have been collected in the framework of the ERMES work group. New measurements are also being collected by means of Portable Emission Measurement Systems (PEMS). These data may be used to improve the modelling of cold-start for the Guidebook. (Target date: 2011; approximate cost: €20,000)

## **V. Agriculture and Nature Expert Panel**

34. The agriculture and nature expert panel currently has the capacity to undertake certain Guidebook updates. However, there are specific subject areas which require resources beyond current levels if they are to be investigated and included in the Guidebook. Details are included below, and summarized in Annex 1.

### **Guidebook technical improvement proposals**

**(a) Review of non-methane volatile organic compounds (NMVOC) emissions from manure management systems (chapter 4B) (Priority 1)**

35. It is known that non-methane volatile organic compounds (NMVOC) emissions from manure management systems can be significant and would probably be a key source for many Parties. At the 2009 and 2010 Task Force meetings it was concluded that the available emission factors were unreliable and should not yet be included in the Guidebook. As a consequence, there is currently no Tier 1 or Tier 2 methodology for this source. This task is estimated to would cost approximately €30,000.

**(b) Review of Ammonia Emissions from Fertilizers (Chapter 4D) (Priority 2):**

36. It emerged during the revision of the Guidebook that the methodology for estimating ammonia emissions from fertilizers and the associated emission factors were based on expert judgement rather than a systematic review of the scientific knowledge and data available. The scientific basis for both the current methodology and the emission factors is therefore uncertain, and a review is required. The review should update the existing methodology to take account of the current understanding of the processes driving these emissions, and also update the default emission factors to take account of measurements that have become available in the last revision of this methodology. This task is estimated to cost approximately €12,500.

**(c) Methodology for calculating ammonia from biogas facilities (Priority 3):**

37. A methodology is needed that integrates with the methodology in 4B for calculating ammonia emissions from manure management systems. The methodology will take account of the transformations of organic and mineral nitrogen within the biogas facility. First estimates of nitrogen oxide (NO) emissions would also be included. It is estimated that this task would cost approximately €7,500 for an initial study.

## **VI. Projections Expert Panel**

38. The projections expert panel is responsible for a relatively small section of the Guidebook, when compared to other expert panels. While this section will require updating periodically, the required resources are small, and are expected to be within the capacity of the Projections Expert Panel.

39. However, the Projections expert panel have raised the issue that there is increased emphasis on the need for robust emissions projections reporting (e.g., for input into activities such as the ongoing revision of the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone). Consequently the Task Force will need to develop the sophistication of the existing methods in the Guidebook which are used for estimating emission projections. This would require coordination with all of the other expert panels under the Task Force, and would be a large undertaking. Cooperation is also needed with the Task Force on Integrated Assessment Modelling.

40. This task is not considered in this version of the Guidebook Maintenance and Improvement Plan, but it is expected that there will be a need for it in future versions, and it will require a significant level of support.

## Annex

**Prioritized tasks requiring support**

Priority rating: Priorities are scored 1–5, 1 being the highest, and representing a technical area in desperate need of improvement

<i>Time frame</i>	<i>Details of tasks</i>	<i>Priority rating*</i>	<i>Estimated cost</i>
<b>Guidebook coordination improvement proposals</b>			
Annual	Guidebook Technical Coordinator role, to liaise between data providers, expert panel leaders, and oversee many of the practicalities associated with the Guidebook updates (20 days/year)	1	€10,000
<b>Guidebook technical improvement proposals</b>			
2011	Combustion and Industry Expert Panel: 3.1 Updates to Chapter 3D, Other Solvent Use (10 days)	1	€5,000
2011	Combustion and Industry Expert Panel: 3.2 Updates to Guidebook Chapter 1.A.4, Small Combustion (20 days)	1	€10,000
	Combustion and Industry Expert Panel: 3.3 PM Fugitive Emissions (30 days)		€15,000
2011	Combustion and Industry Expert Panel: 3.4 Updates to 1.A.2 Manufacturing Industries and Construction (20 days)	1	€20,000
2011	Transport Expert Panel: 4.1 Improvement of D cold-start modelling	1	€20,000
2011	Agriculture and Nature Expert Panel: 5.1 Review of NMVOC Emissions From Manure Management systems (4B) (60 days)	1	€30,000
2011	Combustion and Industry Expert Panel: 3.5 Improve Consistency and Transparency (13 days)	2	€6,500
2011	Agriculture and Nature Expert Panel: 5.2 Review of Ammonia Emissions From Fertilisers (4D) (25 days)	2	€12,500
2011	Combustion and Industry Expert Panel: 3.6 Updates to 1.A.1.c and 1.B.1.b, Manufacture and Fugitives from Solid Fuels (4 days)	3	€2,000
2011	Combustion and Industry Expert Panel: 3.7 Size Distribution of PM Before Secondary Abatement (5 days)	3	€2,500
2011	Agriculture and Nature Expert Panel: 5.3 Methodology for calculating NH <sub>3</sub> emissions from biogas facilities (15 days)	3	€17,500

\* Priority Ratings:

- 1: Critical. This technical area is in desperate need of improvement.
- 2: High Priority. Improvement is a high priority going forward.
- 3: Important. An area that is important to improve/develop.
- 4: Of Value. There is value in undertaking this improvement work.
- 5: Low Importance. To be undertaken once other areas have been addressed.

Note: For reasons of succinctness, priority 4 and 5 tasks are not presented here.