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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 (EMEP)

Thirty-third session
Geneva, 7–9 September 2009
Item 6 (c) of the provisional agenda

PROGRESS IN ACTIVITIES IN 2009 AND FUTURE WORK

EMISSIONS

DRAFT ELEMENTS OF AN EMISSIONS INVENTORY GUIDEBOOK MAINTENANCE AND IMPROVEMENT PLAN

Report by the Chair of the Task Force on Emission Inventories and Projections

1. This report has been prepared by the Chair of the Task Force on Emission Inventories and Projections on the basis of the output from the twenty-second meeting of the Task Force (Vienna, 11–12 May 2009). It presents draft elements of a maintenance and improvement plan for the *EMEP/EEA*[1] *Air Pollutant Emission Inventory Guidebook*, as requested by the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) at its thirty-second session in 2008 (ECE/EB.AIR/GE.1/2008/2, para. 41 (f)).

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

2. The present document outlines responsibilities, tasks and estimated costs for maintaining and improving the Guidebook for consideration by the Steering Body at its thirty-third session and to be further elaborated by the Task Force based on the feedback from the Steering Body.

I. INTRODUCTION

A. The Air Pollutant Emissions Inventory Guidebook

3. In line with the request made by the Steering Body at its thirty-second session in 2008, the Task Force on Emission Inventories and Projection finalized the updating of the *EMEP/EEA Air Pollutant Emissions Inventory Guidebook – Technical Guidance to Prepare National Emission Inventories following the LRTAP*[2] *Convention's Reporting Guidelines and the EU*[3] *National Emission Ceilings (NEC) Directive* (hereinafter, the Guidebook)[4] at its twenty-second meeting (Vienna, 11–12 May 2009). The Guidebook chapters were updated by the Task Force and its expert panels and consultants funded by the European Community.

4. The updated Guidebook will be presented to the Steering Body at its thirty-third session, in September 2009 for adoption and subsequent endorsement by the Executive Body at its twenty-seventh session in 2009. It will constitute the reference Guidebook for the submission of emission inventories under the Convention and the EU NEC Directive.

5. In the interim, prior to its formal adoption, as agreed by the Steering Body the updated Guidebook chapters have been made available for the national experts to use. They can be accessed and downloaded from the website of the European Environment Agency (EEA) (http://eea.europa.eu/emep-eea-guidebook). Following its expected formal adoption by the Steering Body in September 2009, EEA will officially launch and publish the updated and edited version of the Guidebook.

6. The completion and availability of an updated Guidebook is considered to be a significant step forward to ensure that the most up-to-date information is available for the Convention. This will ensure that national emission estimates submitted under the Convention can comply with emissions inventory good practice – transparency, accuracy, completeness, consistency and comparability.

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[2] Long-range Transboundary Air Pollution.

[3] European Union.

[4] http://eea.europa.eu/emep-eea-guidebook

7. At its thirty-second session, in 2008, 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[5] to consider making voluntary contributions to guarantee the provision of up-to-date and good-quality data".[6]

8. The present document has been specifically compiled for consideration by the Steering Body:

(a) To present and explain the numerous challenges associated with ensuring that the Guidebook is maintained to a satisfactory level of quality;

(b) To 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.

9. A separate report with a longer list of detailed potential actions to improve the Guidebook will be compiled for circulation to members of the Task Force. It will be labelled as the "Guidebook Maintenance and Improvement Plan, 2009". It is hoped that this will encourage increased levels of support from the Parties.

B. Structure of this report

10. Chapter II of this report considers the framework that is required for effective maintenance of the Guidebook and makes a proposal regarding the management of the Guidebook.

11. Chapters III to VI present prioritized improvement tasks from the different expert panels of the Task Force, and in particular highlight where important work is not currently able to be undertaken by the Task Force.

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[5] The 1984 Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe.

[6] ECE/EB.AIR/GE.1/2008/2, para. 41 (f).

II. A FRAMEWORK FOR GUIDEBOOK MAINTENANCE

A. Constraints for the Task Force in maintaining and updating the Guidebook

12. The Task Force is constituted of national experts nominated by the Parties to the Convention as well as experts from relevant organizations. It relies on in-kind contributions from Governments to finance the work of the experts (which is available in varying degrees)

13. The lack of dedicated resources has had several important implications for the work 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, which do not necessarily target the priority activities of the Task Force, as defined in the workplan of the Convention;

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

(d) In-kind contributions are typically made by the same small number of countries;

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

14. In light of the above, while the Task Force is an excellent way to bring together national experts knowledgeable in emission inventories, 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.

15. 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.

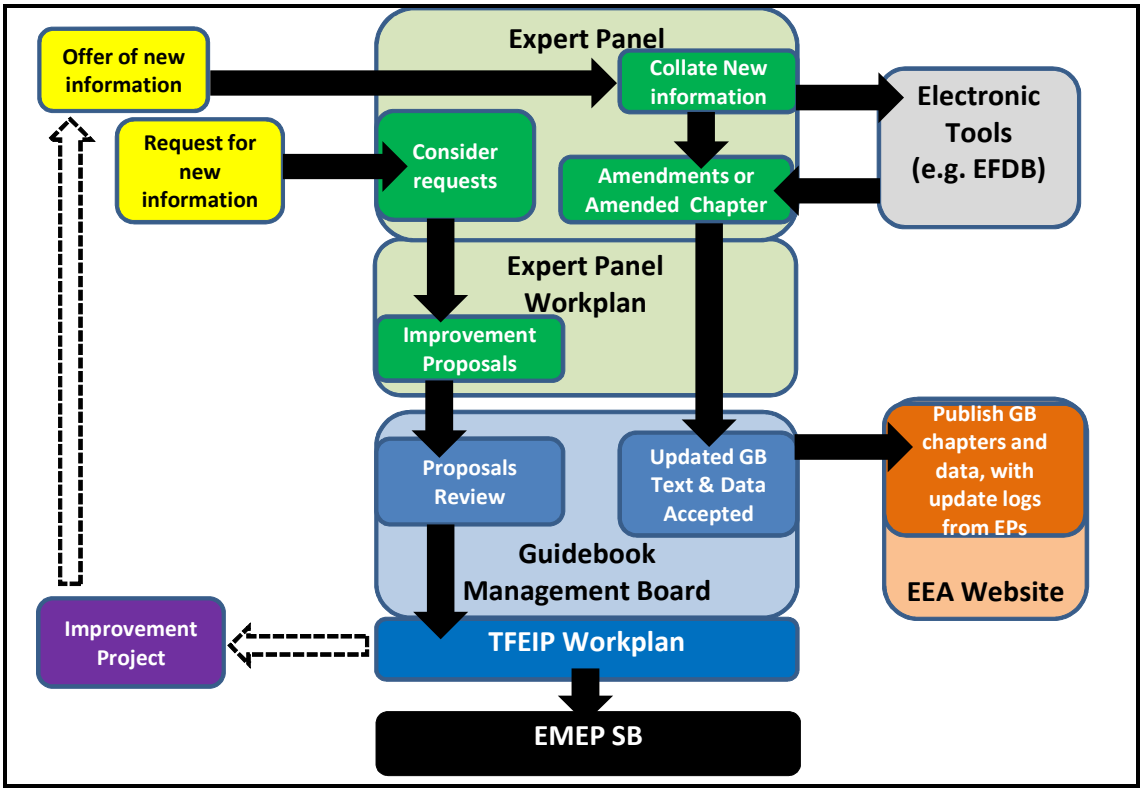
B. Host organization

16. A "host" organization, with a "legal status", would be needed for receiving funds and setting up contracts for fulfilling the tasks needed to maintain and improve the Guidebook. 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

17. Figure 1 below presents an idealised 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



(a) The formation of a Guidebook management board (a priority 1 proposal)

18. It is proposed that a Guidebook management board be established. This board would be responsible for ensuring the effective coordination of the Guidebook maintenance and improvement as well as aspects of delivery. Funding would allow the possibility of centralizing editorial changes to the chapters. This would introduce a level of coordination and control over amendments and ensure consistency across the chapters (and potentially with relevant electronic tools).

19. The board might consist of the Task Force Co-chairs, expert panel leaders and the new post of Guidebook "secretariat" (if there were sufficient funds to support this role). The Guidebook secretariat would ensure that consistency was maintained between the Guidebook chapters and any electronic repository of emission factor information that might be developed in the future, as well as a number of other coordination and linking roles.

20. The board would draw on the work undertaken by the expert panels and annually compile a maintenance and improvement plan. It is important to appreciate that the work of the board is in no way intended to be a substitute for that of the expert panels. Other key tasks would also be undertaken by the board e.g. maintaining the mapping of the Selected Nomenclature for Air Pollution (SNAP) reporting format.

21. To fund the new position of Guidebook secretariat and the other activities for the newly formed Guidebook management board (where this support is not available to these individuals through their current funding arrangements), we estimate the costs to be as follows:

(a) Guidebook secretariat: €15,000 per year;

(b) Other Guidebook management board activities: €10,000 per year.

22. If the Guidebook management board is not funded, the Guidebook development will still continue through the Task Force's expert panels, and efforts will still be made to increase the existing support from Parties. However, the following implications are expected:

(a) With no strong central coordination or support, expert panels will need to edit the chapters directly (as they have done in the past). This is likely to result in a lack of consistency between the Guidebook chapters and any existing electronic tools/databases holding emission factors;

(b) It will not be possible to link with improvement projects to the extent desired and steer output to be directly relevant to the improvement of the Guidebook;

(c) With no strong central coordination it will prove difficult to manage the Guidebook improvement process effectively, and direct any available funds to the priority areas of work.

(b) Improvement projects

(i) The improvement projects indicated in figure 1 are research projects that are designed to address particular Guidebook needs. Formation of a Guidebook management board would allow input into setting the specification of these projects. These projects would provide new data that would feed into the relevant expert panels and ultimately lead to Guidebook improvements.

D. Electronic tools

23. 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).

24. An example of an electronic tool is that EEA has indicated that it is investigating the potential to provide a data viewer as part of its role of publishing the Guidebook on the Web. Similarly, Finland has offered to develop an emission factor library that is likely to include emission factors from the Guidebook. The role of the Guidebook secretariat could ensure that updates to Guidebook chapters were also reflected in the library, and other such electronic tools.

25. The Task Force will endeavour to liaise with organizations developing electronic tools as far as is practical.

III. PRIORITIES IN THE FIELD OF COMBUSTION AND INDUSTRY

26. The combustion and industry expert panel is responsible for a large portion of the sources in the Guidebook. A second Co-Chair (supported/provided by TNO, an environmental consultancy from the Netherlands) has recently offered to assist the work of the expert panel. However, there remain a large number of Guidebook updates and development tasks that are required.

27. The following summarizes the highest priorities for the combustion and industry expert panel. These are also summarized in the annex to this document:

(a) Updates to Guidebook chapter 1.A.1.c, Manufacture of solid fuels and other energy industries (priority 1)

28. This chapter requires revisions to both the emission factors (and the reference list) in a number of different tables. This task is estimated to cost approximately €1,000.

(b) Updates to Guidebook chapter 1.A.2, Manufacturing industries and construction (priority 1)

29. This chapter requires revisions to both the emission factors and the clarification of the combustion/process emissions split and links to chapter 2. The addition of references is also required. To aid this work, an expert panel workshop will be organized in the end of 2009 to discuss the split between combustion and process emissions for reporting purposes. Representatives from industry will be invited to participate in this workshop to give their feedback and proposals for improvement of the current Guidebook. Given the limited budgets available for this sector, it is important to get as much input from these industrial experts as possible. This task is estimated to cost approximately €6,000.

(c) Updates to Guidebook chapter 1.B.1.b on Fugitive emissions from solid fuels: solid fuel fransformation (priority 1)

30. This chapter requires revisions to the emission factors, and the inclusion of references. The estimated cost of the task is approximately €1,000.

(d) Size distribution of particulate matter before secondary abatement techniques (priority 2)

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

(e) Small combustion sources (priority 2)

32. 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 as well as residential). It is estimated that this task would cost approximately €12,500.

(f) Fugitive emissions from solid fuels: coal mining and handling (priority 2)

33. Emission factors for sulphur dioxide, heavy metals, and PM need sourcing. The existing emission factors should be verified. It is estimated that this task would cost approximately €5,000.

(g) Revision of units (priority 3)

34. The units of emission factors need revising to ensure consistency throughout the Guidebook. This task is estimated to cost approximately €1,500.

(h) Central estimate and confidence interval review across the tiers (priority 3)

35. A review of central estimates and confidence intervals across the different tiers is required to ensure full consistency. It is estimated that this task would cost approximately €2,500.

(i) Update of references to previous editions of the Guidebook (priority 3)

36. This task would improve the Guidebook transparency by removing references to documents which in turn refer to previous editions of the Guidebook. It is estimated that this task would cost approximately €2,500.

IV. PRIORITIES IN THE FIELD OF TRANSPORT

37. The Task Force's transport expert panel is in the fortunate position of being involved in steering the deliverables from a number of large projects and ongoing programmes. 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. The items which do not have secured funding are summarized in the annex.

(a) Parameterization of fuel consumption of passenger car emissions for modelling purposes (priority 1)

38. Energy efficiency improvements occur, especially in the passenger car sector, due to technological development. Better understanding of this improvement is required and also the introduction of new parameters in the modelling of energy efficiency. In order to obtain a better estimation of the fuel consumption, a study is required to parameterize the vehicle fuel consumption emissions as a function of different variables, e.g. vehicle weight, engine power,

size, aerodynamics, etc. (date: 2010; approximate cost: €50,000; funding already available from the European Commission's Joint Research Centre (JRC)).

(b) Light-duty vehicle emission factors estimation (priority 1)

39. Much effort has been made by the European Commission to better estimate and characterize the emission factors of different vehicle categories, with the aim of obtaining an accurate emission estimate.

40. Among all vehicle categories, however, light-duty vehicle (LDV) emission factors have rarely been studied in the past, and, consequently their empirical basis is comparatively weak. It is therefore necessary to better characterize LDV emissions and focus on representative real usage conditions. The production of new emission factors will be based on experimental information already collected in the framework of the activities of the ARTEMIS initiative[7] and the "European Research on Mobile Emission Sources" (ERMES) group of experts[8]– it is a new (unofficial) group of experts led by JRC which acts as a clearing house for vehicle emission factors in Europe.ERMES workgroup (date: 2010; approximate cost: €13,500; ongoing and funded by JRC).

(c) Uncertainty estimates and guidance for road transport emission calculations (priority 1)

41. In the Guidebook, it is suggested that atmospheric emission estimates from all sectors (e.g. transport, industry, agriculture) must be accompanied by uncertainty estimates. In fact, the evaluation of uncertainty has implications in estimating the importance of the sources and consequently in policymaking. There are no available estimates of uncertainty for traffic. Consequently it was decided to run a study aimed at quantitatively evaluating uncertainties for road transport emission estimates to be included in the Guidebook (date: 2010; cost: €40,000; ongoing and funded by JRC.)

(d) Improvement of modelling cold-start (priority 1)

42. New emission data on the cold-start performance of cars have been collected in the framework of the ERMES workgroup. New measurements are also being collected by means of

[7] ARTEMIS is a joint technology initiative launched by the European Commission in 2008.

[8] ERMES is an unofficial group of experts led by JRC, which acts as a clearing house for vehicle emission factors in Europe.

Portable Emission Measurement Systems (PEMS). These data may be used to improve the modelling of cold-start for the Guidebook. A complete revision of the methodology would require significantly more measurements and a different approach, extending to other vehicles (e.g. buses, powered two-wheelers.), but this is not included in the current proposal. (date: 2011; approximate cost: €20,000).

(e) Implementation of emission model/data used in the Aviation Emission Trading Scheme (priority 1)

43. A new emission model based on the extensive database of the European Organization for the safety of air navigation (EUROCONTROL) has been elaborated for the application of emission caps for the emission trading scheme for the aviation sector. This method should be adapted in the Guidebook for use by Parties (date: 2010; approximate cost: €10,000; funding already secured (JRC)).

(f) Non-regulated pollutants and greenhouse gases (priority 2)

44. The current road transport emission factors proposed in the Guidebook are the results of a continuously updated review process. However, more efforts have to be made in order to investigate the non-regulated pollutants as well as for the development of new emission factors (date: 2010; approximate cost: €13,500; ongoing and funded by JRC).

(g) New technologies (e.g. electric, hybrids, flexi-fuel) emission factors estimation (priority 2)

45. Since the road transport chapter of the Guidebook includes few emission factors for newer vehicle technology (only for hybrid vehicles) and since the future market share of these vehicle categories will increase, there is a need of having more emission factors for these new technologies (date: 2011; approximate cost: €2,500; funding available).

(h) Metal content in the exhaust (priority 2)

46. The current Guidebook chapter proposes some values of apparent fuel concentration in heavy metals. These values take into account both the content of fuel in metals, but also the equivalent contribution of lubricant oil consumption and engine attrition to exhaust emissions. Some new evidence shows that the current values used are rather outdated and that new experimental information exists to update these values (approximate cost: €1,000).

(i) Maritime navigation (priority 2)

47. New activity data and emission factors at tier 3 level may be produced by taking advantage of the Lloyds database (date: 2009; approximate cost: €7,000; funding secured (EEA)).

V. PRIORITIES IN THE FIELD OF AGRICULTURE AND NATURE

48. The Task Forces agriculture and nature expert panel currently has the capacity to undertake 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 the annex to the present document.

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

49. 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 Task Force meeting, it was concluded that the available emission factors were unreliable and should not be included in the Guidebook at that time. As a consequence, there are currently no tier 1 or tier 2 methodologies for this source. It is estimated that this task would cost approximately €30,000.

(b) Review of ammonia emissions from fertilizers (chapter 4D) (priority 2)

50. It emerged during the revision of the Guidebook that this methodology 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. It is estimated that this task would cost approximately €12,500.

(c) Methodology for calculating ammonia from biogas facilities (priority 3)

51. 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 nitrous oxide emissions would also be included. It is estimated that this task would cost approximately €7,500 for an initial study.

(d) Non-methane volatile organic compounds emissions from vegetation (priority 3)

52. The methodology and default emission factors require updating, in light of the results from the recently completed EU funded "Improving and Applying Methods for the Calculation of Natural and Biogenic Emissions and Assessment of Impacts on Air Quality" (NATAIR) project. This is important for the atmospheric modelling community, who to take account of natural emissions when estimating ozone concentrations. The funding for this task has already been sourced.

VI. PRIORITIES IN THE FIELD OF PROJECTIONS

53. The Task Force's 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.

54. However, the projections expert panel has 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 renegotiations of the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone). Consequently, the Task Force will need to further develop the sophistication of the existing methods in the Guidebook that 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.

55. This task is not considered in the 2009 version of the Guidebook maintenance and improvement plan, but it is expected that there will be a need for it in future versions of the maintenance and improvement plan and that these 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 that needs the improvement the most.

Date	Details of task	Priority rating[1]	Estimated cost
	Guidebook maintenance proposals		
2010 & ongoing	2A Guidebook management board: Guidebook secretariat Other Guidebook management board activities	 1 1	 €15,000/year €10,000/year
	Guidebook improvement proposals		
2010	Combustion and industry expert panel: 3A Updates to 1.A.1.c, Manufacture of solid fuels and other energy industries	1	2 days (€1,000)
2010	3B Combustion and industry expert panel: Updates to 1.A.2, Manufacturing industries and construction	1	€6,000
2010	Combustion and industry expert panel: 3C Updates to Guidebook chapter 1.B.1.b, Fugitive emissions from solid fuels: solid fuel transformation	1	2 days (€1,000)
2011	Transport expert panel: 4D, Improvement of the cold-start modeling	1	€20,000
2010	Agriculture and Nature expert panel: 5A, Review of NMVOC emissions from manure management systems (4B).	1	60 days (€30,000)
2010	Combustion and industry expert panel: 3D, Size distribution of PM before secondary abatement techniques	2	5 Days (€2,500)
2010	Combustion and industry expert panel: 3E, Small combustion sources	2	25 days (€12,500)
2010	Combustion and Industry expert panel: 3F, Fugitive emissions from solid fuels: coal mining and handling	2	10 days (€5,000)
2010	4H, Metal content in the exhaust	2	€1,000
2009-2010	Agriculture and nature expert panel: 5B, Review of ammonia emissions from fertilizers (4D)	2	25 days (€12,500)
2010	Combustion and industry expert panel: 3G, Revision of units	3	3 days (€1,500)
2010	Combustion and industry expert panel:	3	5 days

Date	Details of task	Priority rating[1]	Estimated cost
	3H, Central estimate and confidence interval review across tiers		(€2,500)
2010	Combustion and industry expert panel: 3I, Update of references to previous editions of the Guidebook	3	5 days (€2,500)
2010	Agriculture and Nnature expert panel: 5C, Methodology for calculating ammonia emissions from biogas facilities	3	15 days (€7,500)

Note: For reasons of succinctness, priority 4 and 5 tasks are not presented here. A complete list with all items will be circulated to Task Force members attendees to encourage increased supported from the Parties. This full list will also be reviewed at the next Task Force meeting in 2010.
