

Proposal for updating the 'Methods and procedures' document laying down the process for the EMEP emission inventory review

Background

- At its 2015 meeting (Milan), the TFEIP discussed potential improvements to the existing emission inventory review process. The discussion identified several potential improvements to help streamline and strengthen the robustness of the current review process.
- Following a presentation of the TFEIP's recommendations, the EMEP Steering Body at its September 2015 meeting subsequently requested the Task Force to assess existing procedures and provide proposals for their improvement.
- The present document presents a proposal for updated Emission Review Guidelines. It is designed to replace the current but outdated 2007 '[Methods and Procedures](#)' guidance. The proposal has been discussed and agreed by the TFEIP at its May 2016 meeting (Zagreb, Croatia)
- The key changes compared to the existing 'methods and procedures' document are:
 - a significant shortening of the text. A significant amount of the existing text is outdated and no longer relevant
 - inclusion of a proposal to increase the frequency of In-depth (Stage 3) reviews for Parties where significant quality issues are found by the Expert Review Teams (para 25). This was one of the recommendations from the TFEIP2015 meeting and is designed to ensure to help ensure in such instances that the findings and recommendations identified by the ERT are implemented and reviewed as soon as possible.
 - A proposal to enable the Expert Review Teams to calculate 'technical corrections' where reported data is found to be inconsistent with the recommended methodologies of the EMEP/EEA Guidebook or where emission estimates are not provided for an NFR source category (para 7(h); 30(j)). Technical corrections would be calculated using only the default methods of the EMEP/EEA Guidebook where available. Note that under the Convention there is no mechanism by which an identified technical correction would be used to adjust a reported 'National Total' for compliance purposes. Their objective is rather to provide capacity building and use the opportunity to provide direct improvements in completeness and consistency of the reported emissions data from Parties.
- Next steps: This proposal will be presented at the September 2016 meeting of the EMEP Steering Body for discussion and formal approval. Subject to Steering Body and if required Executive Body approval, it is anticipated that an updated review procedure would start from 2017.

EMISSION REVIEW GUIDELINES FOR THE TECHNICAL REVIEW OF AIR POLLUTANT EMISSION INVENTORIES REPORTED UNDER THE CONVENTION AND ITS PROTOCOLS

*Proposal for discussion by the Task Force on Emission Inventories and Projections
May 2016*

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I. INTRODUCTION

1. This document describes methods and procedures for the annual review of the air pollution emission data submitted by Parties to the Convention and its protocols in line with their emission reporting obligations. It has been prepared by the Task Force on Emission Inventories and Projections and replaces earlier versions i.e. ECE/EB.AIR/GE.1/2007/16.
2. The document aims to promote consistency in the review of the Parties' data submissions and to establish a process for a thorough and comprehensive technical assessment of national inventories.
3. The emission inventory review will check and assess Parties' data submissions to ensure that the Convention bodies have available adequate and reliable information on annual inventories and emissions trends and to enhance the quality of emission data and associated information reported to the Convention. The review also seeks to achieve a common approach to prioritizing and monitoring inventory improvements under the Convention with those of other organizations with similar interests such as the United Nations Framework Convention on Climate Change (UNFCCC) and the European Union (EU) with respect to the National Emission Ceilings (NEC) Directive. The review process is intended to be transparent and carried out in close cooperation with national experts. The scope of the annual review will depend on resources made available by EMEP.

II. REVIEW APPROACH

4. The technical review process will be in three stages, performed sequentially. At each stage, national experts will have the opportunity to clarify issues or provide additional information related to their inventory. They may also provide feedback on the review process at meetings of the Task Force on Emission Inventories and Projections.
5. Parties to the Convention submit air pollution emission data annually to the EMEP Centre on Emission Inventories and Projections (CEIP). Submissions consist of both quantitative and qualitative information. Quantitative data should be reported using the EMEP reporting templates and in line with the Convention's Emissions and Projections Reporting Guidelines¹ (ECE/EB.AIR/125). Qualitative data, including methodologies used in calculating emissions, should be included in informative inventory reports (IIR) in line with the Reporting Guidelines.
6. The three stages of the annual review are:
 - (a) **Stage 1:** An initial check of the submission for timeliness and completeness;
 - (b) **Stage 2:** An extended review of the submission with respect to consistency and comparability of data;

¹ [Guidelines for Reporting Emissions and Projections Data under the Convention on Long-range Transboundary Air Pollution. Executive Body for the Convention on Long-range Transboundary Air Pollution, 13 March 2014, ECE/EB.AIR/125](#)

(c) **Stage 3:** In-depth reviews of selected national inventories as specified in the annual work plan agreed by the Executive Body; these may be annual centralized reviews or ad-hoc reviews. These reviews assess consistency of the submission with the Reporting Guidelines and EMEP/EEA Guidebook, and provide recommendations on improvements to Parties.

III. RESPONSIBILITIES FOR THE REVIEW PROCESS

7. Those responsible for the annual review process are:

(a) Parties' designated emission experts, who shall calculate emissions and respond to review questions and comments as well as make available any additional information required for the review process;

(b) Parties to the Convention, who shall nominate review expert(s) for the In-depth (Stage 3) review and provide the necessary resources to enable the invited expert(s) to participate in the review. Parties shall inform CEIP of any changes to their list of previously nominated experts. Parties shall further inform CEIP of a national contact point to coordinate communications within each country during the In-depth (Stage 3) review.

(c) The EMEP Steering Body, which shall agree a schedule for Parties' reviews and include this in its annual work plan;

(d) The Task Force on Emission Inventories and Projections, shall follow the review process and suggest potential solutions to any problems identified. The Task Force will propose recommendations to the EMEP Steering Body for further improvements in emission inventories and the review process e.g. informal guidance, templates etc.

(e) The secretariat. On behalf of the Executive Body, the secretariat shall invite Parties to nominate national reviewers with technical inventory expertise. The secretariat shall support CEIP in communication with countries as required.

(f) CEIP, for the Initial (Stage 1) and Extended (Stage 2) reviews, shall:

- (i) publish information submitted by Parties on the CEIP website²;
- (ii) facilitate the reporting and revision of emission data through maintaining and updating the EMEP database of submitted emissions and the interactive data checking tool (REPDAB);
- (iii) perform the Initial (Stage 1) review by making a check of each data submission providing feedback to the Parties' designated emission expert, drawing attention to missing data and to the Stage 1 results, and requesting re-submissions when necessary. The results of the Initial (Stage 1) review shall be published on the CEIP website by the end of April each year.
- (iv) perform the Extended (Stage 2) reviews, providing feedback to the Parties' designated emission expert. The results of the Extended (Stage 2) review shall be published on the CEIP website in May each year.
- (v) act as contact point for Parties' designated emission experts; communicate with Parties' experts throughout the review;

² www.ceip.at

(vi) prepare an annual overview of the Initial (Stage 1) and Extended (Stage 2) review findings and communicate them to Parties, the Task Force and other relevant bodies within EMEP.

(g) CEIP, for the *In-depth (Stage 3) reviews*:

- (i) act as contact point for Parties'; and communicate with the nominated national contact points;
- (ii) maintain an up to date roster of eligible expert reviewers;
- (iii) submit an annual proposal to the EMEP Steering Body to suggest Parties to be reviewed;
- (iv) invite reviewers and lead reviewers from the roster of experts to participate in the scheduled reviews each year;
- (v) prepare and make available data to be reviewed to the stage 3 expert review team (see below) in an appropriate format;
- (vi) provide background material for the stage 3 review team's information, including the Initial (Stage 1) and Extended (Stage 2) review results, informative inventory reports (IIRs), previous review findings and other ad hoc review findings;
- (vii) organize centralized stage 3 review meetings (organize venues and timing for the meetings);
- (viii) edit and publish the In-depth (Stage 3) review reports based upon input provided by the Expert Review Team, and communicate the results to the Parties and EMEP Steering Body;
- (ix) prepare an overview of review findings, indicating priorities for improvements; forward it for consideration by the Parties' designated experts, EMEP and the Task Force.

(h) *The In-depth (Stage 3) Expert Review Team (ERT)* shall:

- (i) carry out the stage 3 reviews in order to assess whether the submissions reported by Parties are consistent with the requirements of the Reporting Guidelines and methodologies of the EMEP/EEA Guidebook. Questions to national experts shall be prepared by the ERT to clarify technical questions identified during the review.
- (ii) where reported data is found to be inconsistent with the recommended methodologies of the EMEP/EEA Guidebook or where emission estimates are not provided for an NFR source category, the ERT shall calculate technical corrections.;
- (iii) prepare a draft review report for each Party reviewed using an agreed template, describing the findings of the In-Depth (Stage 3) review including recommendations for improvements, and clearly describing the justification for and methodological details of any technical correction(s) performed;
- (iv) taking into account comments from Parties, finalise the review report findings.
- (v) The members of the ERT will be invited by CEIP from the roster of review experts as follows:
 - (a) For the annual In-depth (Stage 3) review: typically the ERT will consist of one or two lead reviewers and one or two experts per main sector (energy and transport, industrial processes, solvents, waste, and agriculture);
 - (b) For ad hoc reviews (see para. 17): invited national experts from the roster of experts, representatives of EMEP centres and/or other experts, as appropriate.

For example, the focus of the review could be a defined sector, rather than defined countries. The composition of the ERT would then need to reflect this specific focus;

(c) The head of the CEIP, or his/her representatives, shall support the ERT, but shall not be formally a member of the ERT.

IV. REVIEW OF ANNUAL SUBMISSIONS

A. Initial (Stage 1) review

8. CEIP shall conduct the initial check of the submission noting the timeliness, completeness, adherence to the correct format, and summarize these findings to the Parties. It will request re-submissions as needed and prepare summary of the results for presentation to EMEP and the TFEIP.
9. The annual timetable for the Initial (Stage 1) review shall be as follows:
 - (a) The CEIP will publish on its website country-specific findings within two weeks of the date of receipt of the submission;
 - (b) The national designated emission experts may provide comments on the findings to the CEIP within two weeks of their receipt.
 - (c) Re-submissions due to error or modification should be received within four weeks from the original due date for submission. Late resubmissions (i.e. later than four weeks from the due date for submission) may not be included in the annual inventory review or EMEP modelling exercises, or included in the EMEP emissions database.

B. Extended (Stage 2) review

10. The CEIP will carry out a more detailed assessment of the submitted data, focusing upon:
 - (a) an overview of the key category analysis (KCA) per country;
 - (b) review of comparability between inventories, inter alia, on the basis of implied emission factors and sector and national totals in other reported inventories (e.g. emissions reported under the European Union's NEC Directive and UNFCCC);
 - (c) assessment of completeness and consistency of the time series;
 - (d) checks against previously reported inventories for recalculations and changed estimates to determine whether methods and data have been applied consistently across the latest time series.
11. CEIP shall provide a summary of findings from the Extended (Stage 2) review to Parties, including country-specific questions to Parties where appropriate. IA summary of the results shall be prepared for presentation to EMEP and the TFEIP.
12. The annual timetable for the Extended (Stage 2) review shall be as follows:
 - (a) The CEIP will publish on its website Stage 2 country-specific findings within four weeks of the date of receipt of the submission;
 - (b) The national designated emission experts may provide comments to CEIP within two weeks of their receipt.

C. In-depth (Stage 3) review

i. BACKGROUND

13. Following completion of the Initial (Stage 1) and Extended (Stage 2) review checks, an In-depth (Stage 3) review may be performed by the ERT as part of the annual review process. An ad hoc review may be performed to focus on specific aspects of inventory data quality or science.
14. The purpose of the In-depth (Stage 3) review is to examine in detail, and in a transparent manner, the reported inventory information for consistency with the Reporting Guidelines and the EMEP/EEA Guidebook, providing recommendations for improvement and where appropriate calculation of technical corrections. This will:
 - (a) assist Parties to improve the quality of their emission inventories.
 - (b) ensure that the Convention has adequate and reliable information on annual inventories and emission trends of anthropogenic emissions by sources;
 - (c) advise Parties and the Centres on gaps and revisions needed in country data;
 - (d) inform the work of the Implementation Committee by providing an objective, consistent, transparent and comprehensive technical assessment of the annual quantitative and qualitative inventory information submitted by Parties.
15. The In-depth (Stage 3) review will normally take place as a 'centralized review' i.e. the ERT members will perform initial checks of the data and prepare questions to Parties, prior to meeting for finalising the review of the inventory information of Parties.
16. In-depth (Stage 3) reviews can only be performed when Parties have submitted an informative inventory report.
17. Ad hoc reviews may be organized as 'desk reviews', centralized reviews or in-country reviews, as appropriate. Such ad hoc reviews could, for instance, focus on specific source sectors, specific pollutants such as heavy metals or POPs, gridded and projections data, or on other areas as requested by the Implementation Committee. Where appropriate, ad hoc reviews could be conducted in line with the present Methods and Procedures for the In-depth (Stage 3) review.
18. The review of other data, which is officially reported under the Convention, such as gridded data, projections and large point source data, should be performed regularly, at a minimum four-yearly to coincide with the reporting frequency. These reviews shall be carried out by the EMEP Centres that are the key users of these data.

ii. POLLUTANTS

19. The annual stage 3 review will focus upon those pollutants for which Parties have emission reduction commitments established under the protocols to the Convention. This is the main air pollutants (NO_x, NMVOC, NH₃, PM_{2.5} and SO₂).

20. Other pollutants, for which reporting is required under the Reporting Guidelines i.e. priority heavy metals (Cd, Hg, Pb), particulate matter (BC, PM₁₀ and TSP) and POPs (dioxins and furans, the PAH compounds and HCB) shall also be reviewed as resources allow.
21. Activity data relevant to the pollutants will be assessed in addition to the emission estimates.

iii. SECTORS

22. The review shall cover all the NFR emission source categories relevant for each of the pollutants under review
23. The review should focus particularly on the key categories for a Party. This will include an assessment of the reported and potential other key categories for Parties. The review will assess whether or not such sources were included and evaluate the methods used for estimating these emissions. The scope of the review shall also cover the reported 'memo' items.

iv. FREQUENCY

24. All Parties should be reviewed at a minimum every 5 years.
25. If significant quality issues are identified by the ERT in its In-depth (Stage 3) review findings for a Party, the ERT may propose to the EMEP Steering Body that a more frequent review period be undertaken for the Party concerned. Informed by the ERT's findings, the EMEP Steering Body shall agree upon the future review frequency for the Party e.g. annual or two-yearly, with the aim of helping ensure the findings and recommendations identified by the ERT are implemented and reviewed as soon as possible.
26. The Implementation Committee may request a review be performed for a particular Party.

v. YEARS TO REVIEW

27. The annual review of historic emissions data shall focus on the emissions reported by Parties for a protocol base year and the latest year for which data are available. A focus shall be on ensuring a consistent approach has been taken in estimating emissions for these respective years. In addition, time series consistency checks should be carried out for all years reported as required in the Reporting Guidelines or in individual protocols to the Convention.

vi. PROCEDURES

A. Tasks and responsibilities for the Expert Review Teams

28. Stage 3 ERTs, coordinated by the CEIP, will conduct reviews of reported national emission inventories in order to assess whether the Convention has adequate and reliable information. The individual reviews will provide a detailed examination of the inventory estimates, procedures and methodologies used in the preparation of inventories, covering each Party's national inventory submission, supplementary material submitted by the Party, and previous inventory submissions, as appropriate. The results of the In-depth (Stage 3) review will be communicated to Parties through their nominated national experts.
29. Expert review teams should pay particular attention to those areas of the inventory where problems have been identified in the Initial (Stage 1) and Extended (Stage 2) review stages, findings from previous Stage 3 reviews, or where a Party has reported recalculated estimates.
30. Each expert review team shall:
 - (a) Examine the application of the Reporting Guidelines and the EMEP/EEA Guidebook and identify non-compliance with these requirements;
 - (b) Examine whether the good practice guidance of the EMEP/EEA Guidebook has been applied and documented in the IIR, in particular in relation to transparency, noting the identification of key categories, selection and use of methodologies and assumptions, development and selection of emission factors, collection and selection of activity data, reporting of recalculations and consistent time-series and quality assurance and quality control procedures, and identify any inconsistencies;
 - (c) Compare emission estimates, activity data, implied emission factors and any recalculations with data from previous submissions, to identify any irregularities or inconsistencies;
 - (d) Identify any missing sources and examine any explanatory information relating to their exclusion from the inventory;
 - (e) Identify the reasons for any differences between a Party's and the EMEP emission centre's key category determination;
 - (f) Assess the consistency of information in the reporting tables with that in the IIR;
 - (g) Assess the extent to which issues raised in stages 1 and 2, as well as issues and questions raised by ERTs in previous reports, in other ad-hoc reviews, or identified by the Task Force or Implementation Committee, have been addressed and resolved;
 - (h) Identify areas for further improvement of the inventories and note possible ways for improving the estimation and the reporting of inventory information;
 - (i) Consider the entire inventory process from the collection of data to the reported emission estimates and examine procedures and institutional arrangements for inventory development and management, including quality assurance and quality control, record-keeping and documentation procedures;
 - (j) Calculate technical corrections for those emissions source categories where the Reporting Guidelines and/or methodologies of the EMEP/EEA Guidebook have not been followed, and/or where no emission estimate has been provided. Technical corrections

shall be calculated in consultation with the respective Party by using the default methodologies and emission factors (Tier 1 or Tier 2) provided in the EMEP/EEA Guidebook with activity data from the Parties' submission, IIR, and/or other appropriate sources including national and international statistical organizations. If EMEP/EEA Guidebook methodologies and/or activity data are not available, no technical correction shall be performed

(k) The expert review team may use other relevant technical information in the review process, such as information from national and international organizations.

31. The Task Force together with CEIP may develop further informal guidance for reviewers.

B. Methods and procedures for the review teams

32. Each inventory submission will be assigned to an expert review team that will be responsible for conducting the review in accordance with the procedures and time frames established. A submission by a Party will not be reviewed in two successive reviews by expert review teams with an identical composition.
33. Each expert review team will provide a thorough and comprehensive technical assessment of the inventory information submitted and will, under its collective responsibility, prepare a review report in accordance with the provisions given in this document.
34. Expert review teams will be coordinated by CEIP, which will provide administrative support, and, as appropriate, technical and methodological assistance, as well as assistance in the use of the Reporting Guidelines and the present document on review 'Methods and Procedures'.
35. Expert review teams will be composed of experts from the roster of experts nominated by Parties. Participating experts will serve in their personal capacity and will neither be nationals of a Party under review, have contributed to the compilation of the emission inventory of the Party under review, nor be nominated or funded by a Party under review.
36. In the conduct of the review, expert review teams shall work on the basis of established and published procedures, including quality assurance and control and confidentiality.
37. The CEIP will notify Parties about upcoming centralized reviews to identify the contact person(s) through whom enquiries can be directed.
38. Communication between the expert review teams and the designated emission expert of the Party under review should be through the lead reviewers or CEIP. Other members of the expert review team may communicate directly with the national experts involved in the inventory preparation only if a Party so agrees. Information thus obtained should be made available to other members of the team.

C. Expert review team composition

39. Participating experts shall have experience in the area of compiling and/or reviewing long-range transboundary air pollution inventories in general and/or in specific sectors (energy and transport; industrial processes; solvents and other products use, waste; and agriculture).
40. Expert review teams may vary in size and composition, taking into account the national circumstances of the Parties under review and the different expertise needed for the specified scope of the review. In general, the normal size of an expert review teams should be six to eight experts for a centralized review (one to two experts per inventory sector plus one to two lead reviewers). An expert review team for an ad hoc review may be smaller, and may focus on specific source sectors, pollutants or other aspects of the emissions inventory.
41. The CEIP shall invite members of the ERT from the roster of experts in a way that will ensure that the collective skills of a team address the sectors mentioned above and that most experts in a team have the necessary experience in the review process. ERT members shall also be selected with a view to achieving a balance between experts from Parties with different inventories and national circumstances in the overall composition of the expert review teams, without compromising the selection criteria referred to above. The CEIP shall make every effort to ensure geographical balance among those experts selected.

D. Lead reviewers

42. For each expert review team, 1 or 2 inventory experts with substantial inventory review experience will serve as lead reviewers.
43. Lead reviewers should ensure that the review in which they participate is conducted in line with the methods and procedures indicated in the present document and that the expert team carries out the reviews consistently across all Parties under review. They should also ensure the quality and the objectivity of the technical assessments in the reviews.
44. With the support of the CEIP, lead reviewers shall:
 - (a) prepare a brief work plan for the review activity;
 - (b) verify that the experts have all the necessary information provided by CEIP prior to the review activity;
 - (c) ensure that there is good communication within the ERT;
 - (d) monitor the progress of the review activity;
 - (e) coordinate queries of the ERT to the Party's designated emission expert and coordinate the inclusion of the answers in the review reports;
 - (f) provide technical advice to the ERT members and ad hoc experts, if needed;
 - (g) verify that the review team gives priority to individual source categories for review in accordance with these guidelines.
 - (h) ensure that the review is performed in accordance with these guidelines;

- (i) have responsibility for the compilation of the review reports in line with the agreed template and submit the draft reports to CEIP.
- (j) assist CEIP with the finalisation of the review reports following receipt of any country

vii. REVIEW REPORTS

- 45. Under its collective responsibility, the ERT will produce for each reviewed country a review report for publication in electronic format on the CEIP website based on the results of the tasks listed above. The review reports should contain an objective assessment of the adherence of the inventory information to the Reporting Guidelines and should not contain any political judgement.
- 46. The report should be as concise as possible, focussing on particular strengths and identified problems, as well as on an overall appraisal of the quality and reliability of the inventory, emission trends, actual emission factors and activity data, the degree of adherence to the Reporting Guidelines and the EMEP/EEA Guidebook, improvement recommendations, and providing details of any identified technical corrections.
- 47. The review report shall also provide an overview of key review findings including:
 - (a) a summary including assessment of mandatory reporting requirements, timeliness, formats, completed tables;
 - (b) key issues related to data quality, such as an assessment of transparency, major issues relating to completeness and use of methods, major inconsistencies in time series, issues with recalculations, and an overview of identified technical corrections;
 - (c) a summary of identified recommendations and how these relate to the inventory quality criteria defined in the Reporting Guidelines i.e. transparency, consistency, comparability, completeness or accuracy;
 - (d) justification and details of any identified technical corrections;
 - (e) where significant quality issues are identified by the ERT, a proposal to the EMEP Steering Body for a more frequent review period e.g. yearly, two-yearly.
- 48. The main body report shall detail the review findings and recommendations to the Party, including:
 - (a) Inventory system and QA/QC recommendations;
 - (b) Sector specific recommendations for inventory improvements
 - (c) the detailed technical basis upon which technical corrections have been estimated.

viii. REVIEW TIMETABLE AND COMMUNICATION WITH PARTIES

- 49. Annual centralized review: Each expert review team shall prepare the draft individual review reports within eight weeks after the end of the review. CEIP shall edit and format the reports before sending them to the respective Party's nominated contact point for comments. The Party shall respond within four weeks. The ERT shall integrate the comments by the Party within six weeks and send the revised versions of the reports to the CEIP.
- 50. Ad hoc reviews: Each review team shall prepare the draft review reports in accordance with a decided timetable.

51. The final reports will be published on the CEIP website. CEIP will inform Parties' contact points and the CLRTAP secretariat on the status of annual review. The secretariat will communicate with Parties' representatives in the EMEP Steering Body, and with the Implementation Committee.
52. CEIP shall inform the EMEP Steering Body on the status of the review and of the ERT findings in instances where technical correction have been identified and/or a more frequent review period for a Party has been recommended.