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**DRAFT GUIDELINES FOR ESTIMATING
AND REPORTING EMISSIONS DATA**

Prepared by the Task Force on Emission Inventories and Projections and the secretariat

Documents prepared under the auspices or at the request of the Executive Body for the Convention on Long-range Transboundary Air Pollution for GENERAL circulation should be considered provisional unless APPROVED by the Executive Body.
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REVISED GUIDELINES FOR ESTIMATING AND REPORTING EMISSIONS DATA

I. OBJECTIVES

1. The objectives of the present emission reporting guidelines under the Convention on Long-range Transboundary Air Pollution are as follows:

- (a) To assist Parties through a common approach in meeting their obligations under:
 - (i) The 1979 Geneva Convention on Long-range Transboundary Air Pollution, article 8, in particular paragraph (a);
 - (ii) The 1985 Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30%, article 4;
 - (iii) The 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes, article 8;
 - (iv) The 1991 Geneva Protocol on the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes, article 8;
 - (v) The 1994 Oslo Protocol on Further Reduction of Sulphur Emissions, article 5;
 - (vi) The 1998 Aarhus Protocol on Heavy Metals, article 3, paragraph 5, and article 7;
 - (vii) The 1998 Aarhus Protocol on Persistent Organic Pollutants, article 3, paragraph 8, and article 9;
 - (viii) The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, article 7, paragraph 1;
- (b) To facilitate the process of considering Parties' reports on emission inventories and projections, including their technical analysis and compilation; and
- (c) To facilitate the process of verification and technical assessment, including expert review, of the emission reports and the evaluation of data quality for the purpose of the functions of the Implementation Committee (Executive Body Decision 1997/2, annex, para. 3 (c)).

II. PRINCIPLES

2. The term "Parties" in the present guidelines refers to the Parties to the Convention, unless otherwise specified. The term may also refer specifically to the Parties to one or more of the Protocols to the Convention that are in force. The present guidelines should not be understood as implying that a specific Protocol applies to a Party to the Convention which is not a Party to that Protocol.

3. National emission inventories, projected activity data and projected emissions should be transparent, consistent, comparable, complete and accurate.

4. Emission estimates should be prepared using the applicable methodologies agreed upon by the Executive Body and referred to in paragraph 11 below.

5. In the context of the present emission reporting guidelines:

(a) *Transparency* means that the assumptions and methodologies used for emission estimation should be clearly explained to facilitate replication and assessment of the data by users of the reported information. The transparency of emission reporting is fundamental to the success of the process for the communication and consideration of information;

(b) *Consistency* means that emission data should be internally consistent in all their elements with data from other years. Emission data are consistent if the same methodologies are used for all years and if consistent data sets are used to estimate emissions. Under certain circumstances, referred to in paragraphs 15 and 16 below, emission data using different methodologies for different years can be considered to be consistent if they have been recalculated in a transparent manner, taking into account guidance provided in the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook;¹

(c) *Comparability* means that estimates of emissions reported by Parties should be comparable among Parties. For this purpose, Parties should use the applicable methodologies and formats agreed upon by the Executive Body. The allocation of different source categories should follow the split set out in annex III below;

(d) *Completeness* means that a national emission report covers, in accordance with a Party's obligation, at least all sources, as well as all compounds, included in the EMEP/CORINAIR Guidebook, as well as other existing relevant source categories that are specific to individual Parties and, therefore, may not be included in the Guidebook. Completeness also means full geographic coverage of a Party's sources;²

(e) *Accuracy* is a relative measure of the exactness of an emission estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions, as far as can be judged, and that uncertainties are reduced as far as practicable, taking into account appropriate methodologies included in the EMEP/CORINAIR Guidebook.

III. SCOPE

A. General

6. The present guidelines offer voluntary guidance. The Executive Body or EMEP Steering Body may, however, refer to one or more provision(s) of the guidelines in implementing specific authorities delegated to them under the Convention and its Protocols and thereby render such provision(s) legally binding for the Parties to the instrument in question. Minimum reporting, as

¹ Hereinafter referred to as the EMEP/CORINAIR Guidebook.

² In accordance with the instrument of ratification, acceptance, approval or accession of the Convention and/or Protocol by a given Party.

set out below, should be understood as a legal obligation for the respective Parties, in line with the relevant reporting provisions in the Convention and its Protocols, which include, inter alia:

(a) Each Party to the Convention shall, in accordance with article 8, paragraph (a), exchange available information on emissions of agreed air pollutants at periods to be agreed upon;

(b) Each Party to the 1985 Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30% shall, in accordance with article 4, provide annually its level of national annual sulphur emissions, and the basis upon which it has been calculated;

(c) Each Party to the 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes shall, in accordance with article 8, provide its level of national annual emissions of nitrogen oxides and the basis upon which it has been calculated;

(d) Each Party to the 1991 Geneva Protocol on the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes shall, in accordance with article 8, report on the level of emissions of VOCs in its territory and in any tropospheric ozone management area (TOMA) in its territory, by total and, to the extent feasible, by sector of origin and by individual VOC, according and on the basis upon which these levels have been calculated and, in addition, if it is a Party within the geographical scope of EMEP, report information on VOC emissions by sector of origin in the spatial resolution defined by the present guidelines;

(e) Each Party to the 1994 Oslo Protocol on Further Reduction of Sulphur Emissions shall, in accordance with article 5, report information on its level of national annual sulphur emissions, containing emission data for all relevant source categories and, if it is a Party within the geographical scope of EMEP, report information on its level of sulphur emissions with temporal and spatial resolution as specified in the present guidelines;

(f) Each Party to the 1998 Aarhus Protocol on Heavy Metal shall, in accordance with article 3, paragraph 5, and article 7, develop and maintain emission inventories for cadmium, lead and mercury, if it is a Party within the geographical scope of EMEP, using as a minimum the methodologies listed in the present guidelines, and, if it is a Party outside the geographical scope of EMEP, using as guidance the methodologies listed in the present guidelines. Each Party within the geographical scope of EMEP shall report, subject to its laws governing the confidentiality of commercial information, information on its levels of emissions of cadmium, lead and mercury, using as a minimum the methodologies and the temporal and spatial resolution set out in the present guidelines. Each Party outside the geographical scope of EMEP is encouraged to make available similar information, as appropriate. In addition, each Party shall, as appropriate, collect and report relevant information relating to its emissions of other metals, taking into account the guidance on the methodologies and the temporal and spatial resolution given in the present guidelines;

(g) Each Party to the 1998 Aarhus Protocol on Persistent Organic Pollutants shall, in accordance with article 3, paragraph 8, and article 9, develop and maintain emission inventories for the substances listed in annex III to the Protocol (polycyclic aromatic hydrocarbons (PAHs), dioxins and furans (PCDD/F), and hexachlorobenzene). Each Party within the geographical scope of EMEP shall report, subject to its laws governing the confidentiality of commercial information, information on its levels of emissions of persistent organic pollutants using, as a minimum, the methodologies and the temporal and spatial resolution set out in the present guidelines. Each Party in areas outside the geographic scope of EMEP is encouraged to make available similar information;

(h) Each Party to the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone that is within the geographical scope of EMEP shall, in accordance with article 7, paragraph 1 (b) and (c), report information on:

- (i) Levels of emissions of sulphur, nitrogen oxides, ammonia and volatile organic compounds using, as a minimum, the methodologies and the temporal and spatial resolution set out in the present guidelines;
- (ii) Levels of emissions of each substance in the reference year (1990) using the same methodologies and temporal and spatial resolution;
- (iii) Data on projected emissions and current reduction plans; and
- (iv) When it deems it appropriate, any exceptional circumstances justifying emissions that are temporarily higher than the ceilings established for it for one or more pollutants.

Each Party to the Gothenburg Protocol that is in areas outside the geographical scope of EMEP is encouraged to make available information similar to that listed in subparagraphs (i) to (iv) above.

7. In addition to their respective requirements, Parties are encouraged to report, as additional reporting, other information described in the present guidelines.

B. Substances

8. The air pollutants covered by the present guidelines are: sulphur, nitrogen oxides, ammonia, non-methane volatile organic compounds, carbon monoxide, particulate matter, heavy metals (cadmium, lead, mercury, and as additional information: arsenic, chromium, copper, nickel, selenium, zinc) and persistent organic pollutants (aldrin, chlordane, chlordecone, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex, toxaphene, hexachlorocyclohexane (HCH), hexabromobiphenyl, polychlorinated biphenyls (PCBs), dioxins/furans, polycyclic

aromatic hydrocarbons (PAHs), and as additional information: short-chained chlorinated paraffins, pentachlorophenol).³ Parties should identify large point sources (as defined in annex I, paragraph 4 and table 1A) to facilitate the precise inputs of the emissions from major sources in the EMEP models. A definition of the air pollutants and a clarification of how to allocate emissions are given in annex I below.

C. Reporting years

9. According to the Protocols, each Party must, for each Protocol to which it is a Party, report on emissions for:

- The base year of the Protocol; and
- Every year starting with the year of entry into force of the Protocol for that Party, as required by that Protocol, or as delegated by it to the Executive Body to decide.

Annex II sets out the base years for each Protocol. Emission inventory reporting should cover all years from 1980 onwards, if data are available.

10. Parties within the geographic scope of EMEP should report projected activity data and projected national total emissions for SO₂, NO_x, NH₃ and NMVOC for the years 2010, 2015 and 2020.

IV. METHODS

A. General

11. Parties within the geographic scope of EMEP should use the EMEP/CORINAIR Guidebook to estimate emissions and emission projections by source, as defined in the Guidebook. In accordance with the Guidebook, Parties may use different methods to those included in the Guidebook, giving priority to those methods that are believed to produce the most accurate estimates, depending on the data available. Parties can also use national or international methodologies that they consider better able to reflect their national situation, provided that the methodologies are compatible with the Guidebook and are documented. Parties outside the geographic scope of EMEP should use methodologies that are appropriate for the particular circumstances of their national situation, and are documented.

12. Parties may refer to other internationally applied methodologies and guidelines where they apply, including those listed in annex VI (References).

³ The heavy metals and POPs that are subject to the present reporting guidelines are listed in the annual work plan of the Executive Body in accordance with article 3, paragraph 5, and article 7 of the 1998 Aarhus Protocol on Heavy Metals and article 3, paragraph 8, and article 9 of the 1998 Aarhus Protocol on Persistent Organic Pollutants.

13. The EMEP/CORINAIR Guidebook offers for many sources a default methodology that includes default emission factors. As these default factors and assumptions may not always be appropriate for specific national contexts, it is preferable that each Party should use its own national emission factors, where available, provided that they have been developed in a manner consistent with the principles of inventory good practice as laid out in the EMEP/CORINAIR Guidebook, and considered to be more accurate, and the reporting of the emissions and their underlying data are transparent.

14. The Task Force on Emission Inventories and Projections regularly updates the EMEP/CORINAIR Guidebook in order to incorporate the best available scientific information and take account of improved availability of activity data. Parties are encouraged to contribute to this work, especially when they consider the Guidebook to be incomplete or inappropriate for any specific issue. The latest version of the Guidebook, after approval by the Executive Body, is available on the Internet site of the European Environment Agency as well as the EMEP web site (see annex VI – References).

B. Recalculations

15. The aim of recalculations is to ensure consistency of the time series and thus the improvement of accuracy and/or completeness. The inventories of an entire time series, including the base year and all subsequent years for which inventories have been reported, should be estimated using the same methodologies, and the underlying activity data and emission factors should be obtained and used in a consistent manner. Where the methodology or manner in which underlying activity data and emission factors are gathered have changed significantly, each Party should recalculate all inventory data for the base and subsequent years to the extent practicable.

16. However, in some cases activity data or other data may be missing for some historical years, including the base year. In this case, emissions for these years may need to be estimated with alternative methodologies. In these instances, each Party should demonstrate that the time series is consistent. The alternative methodologies should be documented in a transparent manner, taking into account guidance provided by the EMEP/CORINAIR Guidebook.

17. Recalculations cannot change emission ceilings that are set in Protocols in absolute terms. In those Protocols, the base year emission data are given for information only and do not restrict a Party's ability to refine its base year inventory, and subsequent year inventory, as improved information becomes available. Recalculations may also have an impact on emission reduction or control obligations that are relative to base year emissions. If there are significant changes in emissions data, a Party may report on such exceptional circumstances, in particular with reference to article 7, paragraph 1 (b)(iv), of the 1999 Gothenburg Protocol.

C. Uncertainties

18. Each Party should estimate the uncertainties in its inventory, preferably in quantifiable

terms, using the most appropriate methodologies available to it, taking account of guidance provided by the EMEP/CORINAIR Guidebook.

V. REPORTING

A. General guidance

1. Minimum reporting

19. Each Party to the Convention must report, without adjustments related, for example, to climate variations or trade patterns of electricity etc., its national annual emissions of the air pollutants set out in paragraph 8 above which are the subject of an instrument to which it is a Party and should report them for the years as set out in paragraph 9 above.

20. In accordance with paragraph 6 above, emission inventory and projection data should be presented substance by substance in formats and units specified in annex IV (Reporting formats).

21. Parties within the geographic scope of EMEP should report emission inventory data for the source categories set out in the nomenclature for reporting (NFR), in annex III, table III A, annually from the year 2000 (annex IV, table IVs 1A and IV 1B). Parties outside the EMEP region are encouraged to report similar information. Parties are also encouraged to report data going back to 1990 in an appropriate format.

22. For every fifth year from 1990 (1990, 1995, 2000, 2005, etc.), each Party within the geographic scope of EMEP should, as set out in paragraph 6 above, report total and sectoral (as defined in annex III, table III B) emissions of sulphur compounds, nitrogen oxides, ammonia, non-methane volatile organic compounds, carbon monoxide, particulate matter, lead, cadmium, mercury, PAHs, HCB and dioxins/furans for the EMEP grid squares of 50 km x 50 km that overlie its territory (annex IV, tables IV 3A and IV 3B). The EMEP grid is defined in annex V. Parties in areas outside the geographical scope of EMEP are encouraged to make available similar information.

23. For the year 2000 and every fifth year, Parties within the geographical scope of EMEP should provide the following data on large point sources, as defined in annex I below: type of source, geographical coordinates (latitude, longitude), emission quantities of the pollutants listed above and, where appropriate, effective chimney height (annex IV, table IV 3C). Parties in areas outside the geographical scope of EMEP are encouraged to make available similar information.

24. Parties within the geographic scope of EMEP should report for the years 2010, 2015 and 2020, projected activity data and projected national total emissions. Emissions of sulphur, nitrogen oxides, ammonia, non-methane volatile organic compounds should be reported in accordance with annex IV, table IV 2A. Projected activity data should, if available, be reported for the major source categories according to annex IV, tables IV 2B, IV 2C, IV 2D and IV 2E. If projected activity data at this sectoral breakdown are not available, Parties may report activity data

at a different level of aggregation, consistent with NFR. In that case, activity data at the same sectoral breakdown should also be reported for 1990, 1995 and 2000. If necessary, data for intervening years may be derived using appropriate statistical techniques. Parties are encouraged to provide additional documentation for reported projected activity data and emissions. Reported projection data should show the expected future development of polluting activity and of emissions ('current legislation projections') based on national assumptions concerning projected activity levels and considering all legal regulations or other binding measures in place. In addition, each Party should report on current reduction plans taking into account its obligations under the Protocols. Current legislation projections may deviate from current reduction plans in either direction depending on the state of legislation and projected future activity levels. Parties outside the geographic scope of EMEP should provide projected emission totals for years requested at an aggregate level consistent with NFR.

2. Additional reporting

25. In addition to the reporting requirements of the Convention and its Protocols, it is highly desirable, within the framework of the Convention and its Protocols, that each Party should report emissions and projections for review and assessment purposes.

26. Therefore, all Parties are encouraged to report emissions for the following compounds:

- (a) Heavy metals: arsenic, chromium, copper, nickel, selenium and zinc;
- (b) POPs: short-chained chlorinated paraffins and pentachlorophenol.

27. For every fifth year (1990, 1995, 2000, 2005, etc.), Parties within the geographic scope of EMEP are encouraged to inspect and comment on the representativeness of the Party-specific data used for modelling at the Meteorological Synthesizing Centres. This includes:

- (a) Land-use data;
- (b) Diurnal and seasonal (weekly and monthly) temporal patterns of emissions by aggregated sectors (annex III, table III B);
- (c) Emission inventories of mercury broken down into elemental mercury, divalent inorganic gaseous mercury, and mercury associated with particles, as national totals, for source categories and for EMEP grid squares;
- (d) Information on the relative contribution (%) of toxic congeners of PCDD/F emissions: 1,2,3,7,8-PeCDD; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDF;
- (e) Information on natural emissions.

All these data necessary for chemical transport modelling will be available via the Internet on the EMEP home page (see annex VI - References) for transparency and review by each Party. In addition, historical emission data (prior to 1990) for PAHs (benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene), HCB, PCDD/F and

PCB should be reported, as national totals, to aid simulation of the accumulation of POPs in different environmental compartments.

3. Reporting recalculations

28. Recalculations of previously submitted estimates of emissions as a result of changes in methodologies, changes in the manner in which emission factors and activity data are obtained or used, or the inclusion of new sources which have existed since the base year but were not previously reported should be reported for the base year and all subsequent years, up to the year in which the recalculations are made and cover all inventory data. Parties are encouraged to submit recalculations on both a sectoral and gridded basis. Recalculations should result in an improvement in the accuracy and completeness of the inventory and ensure the consistency of the time series. In this regard, each Party should report justifications for these changes. The information on the procedures used for performing the recalculations, changes in the calculation methods, emission factors and activity data used, and the inclusion of new sources, should be documented, indicating the relevant changes in each source category where these changes have taken place. Parties outside the geographic scope of EMEP are not required to provide recalculation information on a gridded basis.

4. Completeness

29. Where methodological or data gaps in inventories exist, information on these gaps should be presented in a transparent manner. Parties should clearly indicate the sources not considered in their inventories but included in the EMEP/CORINAIR Guidebook, and explain the reason for the exclusion. Similarly, each Party should indicate if a part of its territory has been excluded and explain the reason for this. In addition, each Party should use the notation keys presented below to fill the blanks in all the tables of the (NFR) inventory. This approach facilitates assessment of the completeness of emission data reports. The notation keys are as follows:

(a) “NO” (not occurring) for emissions by sources of compounds that do not occur for a particular compound or source category within a country;

(b) “NE” (not estimated) for existing emissions by sources of compounds that have not been estimated. Where “NE” is used in an inventory the Party should indicate why emissions could not be estimated;

(c) “NA” (not applicable) is used for activities in a given source category which are believed not to result in significant emissions of a specific compound;

(d) “IE” (included elsewhere) for emissions by sources of compounds that are estimated but included elsewhere in the inventory instead of in the expected source category. Where “IE” is used in an inventory, the Party should indicate where in the inventory the emissions from the displaced source category have been included and the Party should give the reasons for this inclusion deviating from the expected category;

(e) “C” (confidential) for emissions by sources of compounds which could lead to the disclosure of confidential information. Where “C” is used in an inventory, reference should be made to the Protocol provision that authorizes such practice.

30. If a Party estimates emissions from country-specific sources, or of compounds, that are not part of the EMEP/CORINAIR Guidebook, it should explicitly describe which source categories or compounds these are, as well as which methodologies, emission factors and activity data have been used for their estimation.

5. Data quality

31. Taking into account the EMEP/CORINAIR Guidebook, Parties should validate and verify their data to ensure data quality. Parties are also encouraged to report on any peer review of their emission data. Once received, the Meteorological Synthesizing Centre-West (MSC-W) of EMEP will check data for consistency and if necessary request Parties to provide further explanations to their emission data reports. The Implementation Committee, in accordance with its functions (Executive Body decision 1997/2, annex, para. 3 (c)), will seek, where it deems it necessary, assurance from MSC-W, the Task Force on Emission Inventories and Projections or an expert nominated by the Bureau of the Executive Body, that the quality of emission data has been evaluated.

6. Uncertainties

32. When reporting emissions, the level of uncertainty associated with these data and their underlying assumptions should also be reported to the extent practicable. The methodologies used for estimating uncertainties should be indicated in a transparent manner. Parties are encouraged to report quantitative information on uncertainties, where this is available.

7. Adjustments

33. If Parties, in addition, carry out adjustments to inventory data, related, for example, to climate variations or trade patterns of electricity or trade patterns of road vehicle fuels, they should be reported separately and in a transparent manner, with a clear description of the method followed.

B. Reporting format

34. Each Party should use the reporting format set out in annex IV for its annual submissions. The information should be formally submitted to the UNECE secretariat preferably in electronic form. The reporting format is part of the emissions report referred to in section C below.

35. The reporting format, including NFR, is a standardized format for reporting estimates of emissions, including activity data, projected activity data, projected emissions and other relevant

information. It will be provided to each Party annually by the secretariat and will also be available on the EMEP web site. The reporting format aims at facilitating electronic submissions to simplify the processing of emissions information and the preparation of useful technical analysis and synthesis documentation.

36. The reporting format covers:

(a) National annual emissions and national annual sector emissions using NFR (annex IV, table IV 1A and table IV 1B);

(b) Total and aggregated sector emissions for reporting emissions of sulphur, nitrogen oxides, ammonia, non-methane volatile organic compounds, carbon monoxide, particulate matter, lead, cadmium, mercury, PAHs, HCB and dioxins/furans, for the EMEP grid squares of 50 km x 50 km and emissions from large point sources (annex IV, tables IV 3A, IV 3B and IV 3C);

(c) For the years 2010, 2015 and 2020, projected activity data and projected national total emissions of sulphur, nitrogen oxides, ammonia and non-methane volatile organic compounds to be reported for the source categories listed in annex IV (annex IV, tables IV 2B, IV 2C, IV 2D, IV 2E and IV 2A).

C. Emission data reports by Parties

37. Each emissions data report to be submitted to the secretariat should contain detailed and complete information on the inventories of Parties for all reporting years as well as on projections for 2010, 2015 and 2020 (every fifth year). It should consist of two parts in separate tables: the minimum reporting requirements and the additional reporting. Each Party's emission data should be submitted annually in its entirety to the secretariat preferably in electronic form in accordance with the reporting format explained in paragraphs 34 to 36. Submissions should reach the secretariat before 15 February for data, other than gridded data, on inventories for the calendar year that ended 13 months prior to that date and, if necessary, updates to data for earlier years and the emission projections, e.g. data should be submitted by 15 February 2003 for the calendar year January to December 2001. Gridded data should reach the secretariat no later than 1 March.

38. In addition, Parties are encouraged to submit, no later than three months after submitting their emission data report, an informative inventory report. This should contain:

(a) A description of the specific methodologies and assumptions used in each sector, including a description of any national methodology used by the Party, as well as information on expected future improvements in methodologies;

(b) References or sources of information related to methodologies, emission factors and activity data, as well as the rationale for their selection;

- (c) Information on any recalculations related to previously submitted inventory data, as requested in paragraph 28 above;
- (d) Information on the notation keys as recommended in paragraph 29 above;
- (e) Information on uncertainties, as requested in paragraph 32 above;
- (f) Information on any quality assurance/quality control (QA/QC) procedures implemented;
- (g) A separate section clearly identifying major changes with respect to the previous years, including changes in methodologies, sources of information and assumptions;
- (h) Information on the following general assumptions (key features of the projection used for the preparation of the reported projection data) should be provided: GDP (sectoral value added, if available) in constant prices for the year 1990, and population.

39. Each Party should publish their emission data and inventory reports, for instance by making them available on the Internet in their entirety.

VI. RECORD-KEEPING

40. Emission and projection data reported under the Convention will be stored in the UNECE/EMEP emission database. This database is to be accessible to each Party via the Internet and will contain relevant links to national web sites.

41. Each Party should gather and archive all relevant emission information for each year, including all disaggregated emission factors, activity data and documentation about how these factors and data have been generated and aggregated for reporting. This information should allow the reconstruction of the inventory, inter alia, for the purpose of its evaluation for use by the Implementation Committee. Inventory information should be archived from the base year, including the corresponding data on recalculations. The audit trail should enable estimates of emissions to be traced back to the original disaggregated emission factors and activity data. This information should also facilitate clarification of inventory data when the secretariat compiles annual emissions data or assesses methodologies. Parties are encouraged to collect and gather the information in a single national authority or, at least, to keep the number of authorities to a minimum.

VII. LANGUAGES

42. The emission data and inventory reports are to be submitted in one of the working languages of the United Nations Economic Commission for Europe in accordance with its rules of procedure. Where relevant, Parties are encouraged to submit also a translation of the reports into English.

VIII. UPDATING OF THE GUIDELINES

43. The present guidelines are subject to review and revision by 2007, at the latest. The Task Force on Emission Inventories and Projections may, if necessary, adjust the guidelines to meet evolving needs and ensure efficient reporting to the EMEP Steering Body. Such modifications should be minor and technical in nature.

Annex I

DEFINITIONS

1. The following definitions of air pollutants apply:

(a) Sulphur means all sulphur compounds, expressed as sulphur dioxide (SO₂);

Note: The major part of anthropogenic emissions of sulphur oxides to the atmosphere is in the form of SO₂ and, therefore, emissions of SO₂ and SO₃ should be reported as SO₂ in mass units. Emissions of other S compounds such as sulphate, H₂SO₄ and non-oxygenated compounds of sulphur, e.g. H₂S, are less important than the emissions of sulphur oxides on a regional scale. However, they are significant for some countries. Therefore, Parties are also recommended to report emissions of H₂SO₄, sulphates, and total reduced sulphur (TRS) as SO₂ in mass units. All anthropogenic sources of sulphur oxides should be considered.

(b) Nitrogen oxides means nitric oxide and nitrogen dioxide, expressed as nitrogen dioxide (NO₂);

(c) Ammonia is NH₃;

(d) Non-methane volatile organic compounds (VOC) means any organic compound having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use. For the purpose of these guidelines, the fraction of creosote which exceeds this value of vapour pressure at 293.15 K should be considered as a VOC;

(e) Carbon monoxide is CO;

(f) Particulate matter refers to three size classes: PM_{2.5} (diameter < 2.5 µm); PM₁₀ (diameter < 10 µm) and TSP (total suspended particulate matter);

(g) Heavy metals means those metals or, in some cases, metalloids which are stable and have a density greater than 4.5 g/cm³ and their compounds. Minimum reporting covers cadmium, lead and mercury. Additional reporting covers arsenic, chromium, copper, nickel, selenium and zinc;

(h) Persistent organic pollutants (POPs) are organic substances that: (i) possess toxic characteristics; (ii) are persistent; (iii) bioaccumulate; (iv) are prone to long-range transboundary atmospheric transport and deposition; and (v) are likely to cause significant adverse human health or environmental effects near to and distant from their sources. Minimum reporting covers: aldrin (CAS: 309-00-2), chlordane (CAS: 57-74-9), chlordecone, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex, toxaphene, hexachlorocyclohexane (HCH), hexabromobiphenyl, polychlorinated biphenyls (PCBs), dioxins/furans (PCDD/F), and polyaromatic hydrocarbons (PAHs), additional reporting covers short-chained chlorinated

paraffins and pentachlorophenol. In accordance with annex III to the Protocol on POPs, the following indicator compounds should be used for PAHs: benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene.]

Note 1: It is recommended that the emissions of different congeners of PCDD/F are given in toxicity equivalents (TE) in comparison to 2,3,7,8-TCDD using the system proposed by the NATO Committee on the Challenges of Modern Society (NATO-CCMS) in 1988.

Note 2: It is recommended that the four PAH compounds are reported separately by mass.

Any departure from these definitions should be reported upon and justified.

2. Without prejudice to a Party's ability to report emissions on the basis of effective methods appropriate to its national circumstances (e.g. based on fuel consumption or distance travelled in its territory) for purposes of assessing compliance with Protocol obligations, Parties within the geographic scope of EMEP are encouraged, for modelling purposes, to also report emissions from mobile sources on the basis of where fuels are sold to the final consumer, if they do not choose that method for compliance purposes. Emissions based upon fuels sold to ships or aircraft engaged in international transport should not be included in national totals, but reported separately as memo items in table IV 1A (annex IV).

3. Validation is the establishment of a sound approach and foundation. In the context of emission inventories, validation involves checking to ensure that the inventory has been compiled correctly in line with reporting instructions and guidelines. It checks the internal consistency of the inventory. The legal use of validation is to give an official confirmation or approval of an act or product.

4. Large point sources (LPS) are stationary sources (processes) with one or more stacks. One or more processes can be within a facility. For EMEP purposes, not all stacks have to be identified. Parties can aggregate the emissions of all processes within a facility (per NFR category) related to the physical height of the stack. All stationary source facilities discharging more than 500 metric tons per year of SO₂, NO_x, NMVOC or TSP are considered as large point sources,¹ whatever the type of emitter or sector. The emissions of the different processes within a facility should be aggregated before checking these criteria. In addition, all stationary processes mentioned in the following table are to be considered as large point sources for the different components. The table indicates for each process the most relevant pollutant. The last column indicates from what capacity onwards the LPS emissions (for the crossed components) of the process should be included in the LPS reporting. Parties are invited to include all (not only the crossed) components in their report.

¹ Large airports meeting one of these criteria should also be considered as LPS.

Table I A: Stationary processes considered as large point sources for different components

	NO _x	SO ₂	NH ₃	NMVOC	CO	HM	PCDD/F	PAH	HCB	TSP	Capacity to consider
Combustion plants	X	X			X	X	X			X	> 300MW
Waste incineration plants, including co-incineration, and cremations					X	X	X	X	X		50 tons waste/day
Thermal metallurgical processes, e.g. production of aluminium and other non-ferrous metals, iron and steel, ferroalloys	X	X			X	X	X		X	X	All primary processes: sinter plants smelters, etc.
Aluminium production (via Soederberg process)								X			All
Cement production	X	X				X				X	All
Refineries	X	X		X	X	X	X	X		X	All
Coke and anode production					X			X			All
Sulphuric acid production	X	X									All
Ammonia and nitric acid production	X		X								All
Specific chemical production processes,^{a)} releasing intermediates and by- products							X		X		All
Airports	X			X	X						
Vehicle painting units				X							> 10 ⁵ vehicles/year
Use of chlorinated fuels in furnace installations							X		X		All
Wood preservation installations^{b)}				X				X			

^{a)} Including only aircraft exhaust emissions; emissions from machinery can be reported separately.

^{b)} Except for a Party for which this category does not make a significant contribution to its total emissions of PAH.

Notes:

1/ Parties for which none of their processes in either the energy sector or in industry meets the above criteria are encouraged to report all those processes emitting more than 10% of the national emission for the different components. For each large point source the following data should be provided on the template provided by MSC-W and shown in table IV 3C in annex IV: Name of the source; NFR category (aggregated); Geographical coordinates (latitude, longitude; both given as degrees with decimal digits [i.e. 50.5 corresponds to 50 degree and 30 minutes]);² Physical height of stack;³ Emission quantities of relevant pollutants.

2/ For facilities with multiple stacks, it is not necessary to identify each stack individually. In these cases the coordinates of the middle of the facility or plant can be used. See also note 3.

3/ Emission quantities should be provided related to the physical height of the stack above surface. For modelling purposes, it is required to report the emission fluxes in the following height classes: below 45 metres; between 45 and 100 metres; between 100 and 150 metres; between 150 and 200 metres; above 200 metres. If available, Parties are encouraged to provide more detailed information on stack height for their large point sources, by filling the height column. The emissions should be filled in the appropriate height class column. (See table).

4/ Further guidance on allocation of emissions to domestic and international shipping and flights are given in the EMEP/Corinair Guidebook and the approach is consistent with the Intergovernmental Panel on Climate Change (IPCC) good practice guidance.

Annex II

BASE YEARS

I. 1985 Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30%

Common base year: 1980

II. 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes

Common base year, except for United States: 1987.

Base year for United States: 1978

III. 1991 Geneva Protocol on the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes

Base year for:

Austria, 1988

Belgium, 1988

Bulgaria, 1988

Czech Republic, 1990

Denmark, 1985

Estonia, 1988

Finland, 1988

France, 1988

Germany, 1988

Hungary, 1988

Italy, 1990

Liechtenstein, 1984

Luxembourg, 1990

Monaco, 1990

Netherlands, 1988

Norway, national, 1988, TOMA, 1989

Slovakia, 1990

Spain, 1988

Sweden, 1988

Switzerland, 1984

United Kingdom, 1988

IV. 1994 Oslo Protocol on Further Reduction of Sulphur Emissions

Absolute emission ceilings, and base year data for 1980 and 1990 are given in the Protocol for information only.

V. 1998 Aarhus Protocol on Heavy Metals

Base year for cadmium, lead and mercury: all Parties to the Convention that had ratified this Protocol by 2 April 2002 selected 1990.

VI. 1998 Aarhus Protocol on Persistent Organic Pollutants

Base year for PAHs, dioxins/furans and hexachlorobenzene: All Parties to the Convention that had ratified this Protocol by 2 April 2002 selected 1990.

VII. 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone

Absolute emission ceilings for sulphur, nitrogen oxides, ammonia and volatile organic compounds, and base year data for 1990 (and for 1980 and 1990 for sulphur) are given in the Protocol for information only.

Annex III

NOMENCLATURE FOR REPORTING AND FUEL DEFINITIONS

This annex provides the corresponding allocation of EMEP NFR source categories and United Nations Framework Convention on Climate Change (UNFCCC) common reporting format (CRF) source categories into SNAP 97 items. Items shaded light-grey are memo items and should be reported separately. Items shaded dark grey indicate where the EMEP/CORINAIR Guidebook will be extended.

All codes used in this document refer to:

- CORINAIR / SNAP 97 version 1.0 dated 20 March 1998
- The UNFCCC CRF, UNFCCC Guidelines on reporting and review, FCCC/CP/1999/7, 16 February 2000

Table III A: Corresponding allocation of EMEP/NFR source categories and UNFCCC/CRF source categories into SNAP 97

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
1 A 1 Energy Industries	1 A 1 a	1 A 1 a Public Electricity and Heat Production			01 01 Public power (01.01.01 to 01.01.05) 01 02 District heating plants (01.02.01 to 01.02.05)
	1 A 1 b	1 A 1 b Petroleum refining			01 03 Petroleum refining plants (01.03.01 to 01.03.06)
	1 A 1 c	1 A 1 c Manufacture of Solid Fuels and Other Energy Industries			01 04 Solid fuel transformation plants (01.04.01 to 01.04.07) 01 05 Coal mining, oil / gas extraction, pipeline compressors (01.05.01 to 01.05.05)
1 A 2 Manufacturing Industries and Construction	1 A 2	1 A 2 Manufacturing Industries and Construction			
	1 A 2 a	1 A 2 a Iron and Steel			03 01 (a) Manuf. indus. combust. in boilers, gas turbines and stationary engines (03.01.01 to 03.01.06)
					03 02 03 Blast furnace coppers
					03 03 01 Sinter and pelletizing plants
					03 03 02 Reheating furnaces steel and iron
					03 03 03 Grey iron foundries
					08 08 (a) Other mobile and machinery/Industry
	1 A 2 b	1 A 2 b Non-ferrous Metals			03 01 (a) Manuf. indus. combust. in boilers, gas turbines and stationary engines (03.01.01 to 03.01.06)
	1 A 2 b	1 A 2 b Non-ferrous Metals			03 03 04 to 03 03 09 Primary and secondary Pb/Zn/Cu production

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
					03 03 10 Secondary Aluminium production 03 03 22 to 03 03 24 Alumina, Magnesium and Nickel production 08 08 (a) Other mobile and machinery/Industry
	1 A 2 c	1 A 2 c Chemicals			03 01 (a) Manuf. indus. combust. in boilers, gas turbines and stationary engines (03.01.01 to 03.01.06) 08 08 (a) Other mobile and machinery/Industry
	1 A 2 d	1 A 2 d Pulp, Paper and Print			03 01 (a) Manuf. indus. combust. in boilers, gas turbines and stationary engines (03.01.01 to 03.01.06)
					03 03 21 Paper-mill industry (drying processes) 08 08 (a) Other mobile and machinery/Industry
	1 A 2 e	1 A 2 e Food Processing, Beverages & Tobacco			03 01 (a) Manuf. indus. combust. in boilers, gas turbines and stationary engines (03.01.01 to 03.01.06) 08 08 (a) Other mobile and machinery/Industry
	1 A 2 f	1 A 2 f Other (Please specify in a covering note)			03 01 (a) Manuf. indus. combust. in boilers, gas turbines and stationary engines (03.01.01 to 03.01.06) 03 02 04 Plaster furnaces 03 02 05 Other furnaces 03 03 11 to 03 03 20 Cement, Lime, Asphalt concrete, Glass, Mineral wool, Bricks and Tiles, Fine Ceramic materials 03 03 25 Enamel production 03 03 26 Other process with contact 08 08 (a) Other mobile and machinery/Industry
1 A 3 Transport	1 A 3 a i (i)	1 A 3 a i International Aviation	1 A 3 a i (i) International Aviation (LTO)		08 05 02 Internat. airport traffic (LTO cycles - <1000 m)
	1 A 3 a i (ii)		1 A 3 a i (ii) International Aviation (Cruise)		08 05 04 International cruise traffic (>1000 m)

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
	1 A 3 a ii (i)	1A 3 a ii Civil Aviation (Domestic)	1 A 3 a ii (i) Civil Aviation (Domestic, LTO)		08 05 01 Domestic airport traffic (LTO cycles - <1000 m)
	1 A 3 a ii (ii)		1 A 3 a ii (ii) Civil Aviation (Domestic, Cruise)		08 05 03 National cruise traffic (>1000 m)
	1 A 3 b	1 A 3 b Road Transportation	1 A 3 b i R.T., Passenger cars 1 A 3 b ii R.T., Light duty vehicles 1 A 3 b iii R.T., Heavy duty vehicles		07 01 Passenger cars (07.01.01 to 07.01.03)
	1 A 3 b i				07 02 Light duty vehicles < 3.5 t (07.02.01 to 07.02.03)
	1 A 3 b ii				07 03 Heavy duty vehicles > 3.5 t and buses (07.03.01 to 07.03.03)
	1 A 3 b iii				
	1 A 3 b iv		1 A 3 b iv R.T., Mopeds and Motorcycles		07 04 Mopeds and Motorcycles < 50 cm3
					07 05 Motorcycles > 50 cm3 (07.05.01 to 07.05.03)
	1 A 3 b v		1 A 3 b v R.T., Gasoline evaporation		07 06 Gasoline evaporation
	1 A 3 b vi		1 A 3 b vi R.T., Automobile tyre and brake wear		07 07 Tyre and Brake wear
	1 A 3 b vii		1 A 3 b vii R.T., Automobile road abrasion		07 08 proposed Road Abrasion chapter needed in Guidebook.
	1 A 3 c	1 A 3 c Railways			08 02 Railways (08.02.01 to 08.02.03)
	1 A 3 d	1 A 3 d Navigation			
	1 A 3 d i	1 A 3 d Navigation	International Navigation (b)		08 04 04 International sea traffic (internat. bunkers)
	1 A 3 d ii		1 A 3 d ii National Navigation		08 04 02 National sea traffic within EMEP area 08 03 01 to 08 03 04 Inland waterways
	1 A 3 e	1 A 3 e Other (Please specify in a covering note)			
	1 A 3 e i		1 A 3 e i Pipeline compressors		01 05 06 Pipeline compressors
	1 A 3 e ii		1 A 3 e ii Other mobile sources and machinery		08 10 Other mobile sources and machinery
1A4 Other Sectors	1 A 4 a	1 A 4 a Commercial / Institutional			02 01 Commercial and institutional plants (02.01.01 to 02.01.06). Military excluded
	1 A 4 b	1 A 4 b Residential			
	1 A 4 b i		1 A 4 b i Residential plants		02 02 Residential plants (02.02.01 to 02.02.05)
	1 A 4 b ii		1 A 4 b ii Household and gardening (mobile)		08 09 Household and gardening (mobile motors)

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
	1 A 4 c	1 A 4 c Agriculture / Forestry / Fishing			
	1 A 4 c i		1 A 4 c i Stationary		02 03 Plants in agriculture, forestry and aquaculture (02.03.01 to 02.03.05)
	1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		08 06 Agriculture (mobile motors and machines) 08 07 Forestry (mobile motors and machines)
	1 A 4c iii		1A 4c iii National Fishing		08 04 03 National fishing (mobile motors and machines)
1 A 5 Other	1 A 5 a	1 A 5 a Other, Stationary (including Military)			02 01 Commercial and institutional plants (02.01.01 to 02.01.06) (military only)
	1 A 5 b	1 A 5 b Other, Mobile (including Military)			08 01 Military
1B1 Fugitive Emissions from Fuels	1B1	1B1 Fugitive Emissions from Solid Fuels			
	1 B 1 a	1 B 1 a Coal Mining and Handling			05 01 Extraction and 1st treatment of solid fossil fuels (05.01.01 to 05.01.03)
	1 B 1 b	1 B 1 b Solid fuel transformation			04 02 01 Coke oven (door leakage and extinction)
					04 02 04 Solid smokeless fuel
	1 B 1 c	1 B 1 c Other (Please specify in a covering note)			
	1 B 2	1 B 2 Oil and natural gas			
	1 B 2 a	1 B 2 a Oil			
	1 B 2 a i	1 B 2 a i Exploration 1 B 2 a ii Production	1 B 2 a i Exploration Production, Transport		05 02 Extraction, 1st treatment and loading of liquid fossil fuels (05.02.01 to 05.02.02)
		1 B 2 a iii Transport			05 04 Liquid fuel distribution (except gasoline distribution) (05.04.01 to 05.04.02)
	1 B 2 a iv	1 B 2 a iv Refining / Storage			04 01 Processes in petroleum indust. (04.01.01 to 04.01.05)
	1 B 2 a v	1 B 2 a v Distribution of oil products			05 05 Gasoline distribution (05.05.01 to 05.05.03)
	1 B 2 a vi	1 B 2 a vi Other			
	1 B 2 b	1 B 2 b Natural gas			05 03 Extraction, 1st treat. and loading of gaseous fossil fuels (05.03.01 to 05.03.03) 05 06 Gas distribution networks (05.06.01 to 05.06.02)
	1 B 2 c	1 B 2 c Venting and flaring			09 02 03 Flaring in oil refinery 09 02 06 Flaring in oil and gas extraction

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
2 A MINERAL PRODUCTS (c)	2 A	2 A MINERAL PRODUCTS (c)			
	2 A 1	2 A 1 Cement Production			04 06 12 Cement (decarbonizing)
	2 A 2	2 A 2 Lime Production			04 06 14 Lime (decarbonizing)
	2 A 3	2 A 3 Limestone and Dolomite use			04 06 18 Limestone and Dolomite Use
	2 A 4	2 A 4 Soda Ash Production and use			04 06 19 Soda Ash Production and Use
	2 A 5	2 A 5 Asphalt Roofing			04 06 10 Roof covering with asphalt materials
	2 A 6	2 A 6 Road Paving with Asphalt			04 06 11 Road paving with asphalt
	2 A 7	2 A 7 Other including Non Fuel Mining and Construction (Please specify in a covering note)			04 06 13 Glass (decarbonizing)
					04 06 15 Batteries manufacturing
					04 06 16 Extraction of mineral ores
					04 06 17 Other (includ. Asbestos products manufacturing)
2 B CHEMICAL INDUSTRY (c)					xxxxxxx Mining & Construction Guidebook Development required
	2 B	2 B CHEMICAL INDUSTRY			
	2 B 1	2 B 1 Ammonia Production			04 04 03 Ammonia
	2 B 2	2 B 2 Nitric Acid Production			04 04 02 Nitric acid
	2 B 3	2 B 3 Adipic Acid Production			04 05 21 Adipic acid
	2 B 4	2 B 4 Carbide Production			04 04 12 Calcium carbide production
	2 B 5	2 B 5 Other (Please specify in a covering note)			04 04 01 Sulfuric acid
					04 04 04 to 04 04 06 Ammonium sulphate / nitrate / phosphate
	2 B 5	2 B 5 Other (Please specify in a covering note)			04 04 07 and 04 04 08 NPK fertilizers, Urea
					04 04 09 to 04 04 11 Carbon black, Titanium dioxide, Graphite
					04 04 13 Chlorine
					04 04 14 Phosphate fertilizers
					04 04 15 Storage and handling of inorganic products
					04 04 16 Other process in inorganic chemical industry
					04 05 Processes in organic chemical industry except adipic acid (04.05.01 to 04.05.20, 04.05.22 to 04.05.26 and 04.05.34)

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
2 C METAL PRODUCTION (c)	2 C	2 C METAL PRODUCTION 2 C 1 Iron and Steel Production			04 02 02 Blast furnace charging 04 02 03 Pig iron tapping
		2 C 2 Ferroalloys Production 2 C 3 Aluminium Production			04 02 05 to 04 02 10 Furnace steel plant, Rolling mills, Sinter and pelletizing plants (except combustion), Other Ferro alloys 04 03 02 04 03 01 Aluminium production (electrolysis)-except SF6
		2 C 5 Other		2 C 4 SF6 Used in Aluminium and Magnesium Foundries	04 03 03 to 04 03 05 Silicium, Magnesium, Nickel production 04 03 06 Metal alloys manufacturing 04 03 07 Galvanizing 04 03 08 Electroplating 04 03 09 Other processes in non-ferrous industries
2 D OTHER PRODUCTION (c)	2 D	2 D OTHER PRODUCTION (c)			
	2 D 1	2 D 1 Pulp and Paper			04 06 01 Chipboard. Paper pulp 04 06 02 to 04 06 04 Paper pulp
	2 D 2	2 D 2 Food and Drink			04 06 05 to 04 06 08 Bread, Wine, Beer and Spirits
2 E PRODUCTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE				2 E 1 - By-Product Emissions 2 E 2 - Fugitive Emissions 2 E 3 - Other	
2 F CONSUMPTION OF HALOCARBONS AND SULPHUR HEXAFLUORIDE				2 F 1 - Refrigeration and Air Conditioning Equipment 2 F 2 - Foam Blowing 2 F 3 - Fire Extinguishers 2 F 4 - Aerosols 2 F 5 - Solvents 2 F 6 - Other	
2 G OTHER (Please specify in a covering note)	2 G	2 G OTHER (Please specify in a covering note)			

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
specify in a covering note)					06 05 03 Refrigeration and air conditioning equipment using other products than halocarbons 06 05 06 Aerosol cans
3 A PAINT APPLICATION	3 A	3 A PAINT APPLICATION			06 01 Paint application (06.01.01 to 06.01.09)
3 B DEGREASING AND DRY CLEANING	3 B	3 B DEGREASING AND DRY CLEANING			06 02 Degreasing, dry cleaning and electronics (06.02.01 to 06.02.04)
3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING	3 C	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING			06 03 Chemical products manufacturing or processing (06.03.01 to 06.03.14)
3 D OTHER including products containing HMs and POPs (Please specify in a covering note)	3 D	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)			06 04 Other use of solvents and related activities (06.04.01 to 06.04.12) 06 05 08 Other except for halocarbons and SF6
4 A ENTERIC FERMENTATION				4 A Enteric Fermentation	10 04 Enteric fermentation
4 B MANURE MANAGEMENT (d)	4 B	4 B MANURE MANAGEMENT (d)			
	4 B 1	4 B 1 Cattle			
	4 B 1 a	4 B 1 a Dairy			10 05 01 Manure management regarding organic compounds - Dairy cattle 10 09 01 Manure management regarding nitrogen compounds – Dairy cattle
	4 B 1 b	4 B 1 b Non-Dairy			10 05 02 Manure management regarding organic compounds - Other cattle 10 09 02 Manure management regarding nitrogen compounds – Other cattle
	4 B 2	4 B 2 Buffalo			10 05 14 Manure management regarding organic compounds – Buffalos 10 09 14 Manure management regarding nitrogen compounds – Buffalos
	4 B 3	4 B 3 Sheep			10 05 05 Manure management regarding organic compounds – Sheep 10 09 05 Manure management regarding nitrogen compounds - Sheep
	4 B 4	4 B 4 Goats			10 05 11 Manure management regarding organic compounds – Goats 10 09 11 Manure management regarding nitrogen compounds – Goats

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
	4 B 5	4 B 5 Camels and Llamas			10 05 13 Manure management regarding organic compounds – Camels 10 09 13 Manure management regarding nitrogen compounds – Camels
	4 B 6	4 B 6 Horses			10 05 06 Manure management regarding organic compounds - Horses 10 09 06 Manure management regarding nitrogen compounds - Horses
	4 B 7	4 B 7 Mules and Asses			10 05 12 Manure management regarding organic compounds - Mules and asses 10 09 12 Manure management regarding nitrogen compounds – Mules and asses
	4 B 8	4 B 8 Swine			10 05 03 and 10 05 04 Manure management regarding organic compounds - Fattening pigs, Sows 10 09 03 and 10 09 04 Manure management regarding nitrogen compounds – Fattening pigs, Sows
	4 B 9	4 B 9 Poultry			10 05 07 to 10 05 09 Manure management regarding organic compounds - Laying hens, Broilers, Other poultry 10 09 07 to 10 09 09 Manure management regarding nitrogen compounds – Laying hens, Broilers, Other poultry
				4 B 10 Anaerobic 4 B 11 Liquid Systems 4 B 12 Solid Storage and Dry Lot	
	4 B 13	4 B 13 Other			10 05 10 and 10 05 15 Manure management regarding organic compounds - Fur animals, Other animals 10 09 10 and 10 09 15 Manure management regarding nitrogen compounds – Fur animals, Other animals
4 C RICE CULTIVATION	4 C	4 C RICE CULTIVATION 4 C 1 Irrigated			10 01 03 and 10 02 03 Rice field with/without fertilizers (d)
		4 C 2 Rainfed 4 C 3 Deep Water 4 C 4 Other			
4 D AGRICULTURAL SOILS	4 D	4 D AGRICULTURAL SOILS			
	4 D 1	4 D 1 Direct Soil Emission			10 01 Cultures with fertilizers (10.01.01, 10.01.02 and 10.01.04 to 10.01.06) except 10 01 03

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
	4 D 1	4 D 1 Direct Soil Emission			10 02 Cultures without fertilizers (10.02.01, 10.02.02 and 10.02.04 to 10.02.06) except 10 02 03
4 E PRESCRIBED BURNING OF SAVANNAS				4 E Prescribed Burning of Savannas	
4 F FIELD BURNING OF AGRICULTURAL WASTES	4 F	4 F 1 Cereals 4 F 2 Pulse 4 F 3 Tuber and Root 4 F 4 Sugar Cane 4 F 5 Other	4 F FIELD BURNING OF AGRICULTURAL WASTES (Including 5B)		10 03 01 Cereals 10 03 02 Pulse 10 03 03 Tuber and Root 10 03 04 Sugar Cane 10 03 05 Other
4 G OTHER	4 G	4 G OTHER (e)			10 06 01 to 10 06 04 Use of pesticides
5 A CHANGE IN FOREST AND OTHER WOOD Y BIOMASS STOCKS				5 A CHANGE IN FOREST AND OTHER WOODY BIOMASS STOCKS	
5 B FOREST AND GRASSLAND CONVERSION	5 B	5 B Forest and Grassland conversion			11 22 01 to 11 22 05
5 C ABANDONMENT OF MANAGED LAND				5 C Abandonment of Managed Land	
5 D EMISSIONS AND REMOVALS FROM SOILS				5 D Emissions and Removals from Soils	
5 E OTHER	5 E	5 E Other (b)			11 11 & 11 12 Managed Forests
6 A SOLID WASTE DISPOSAL ON LAND	6 A	6 A SOLID WASTE DISPOSAL ON LAND			
		6 A 1 Managed Waste Disposal			09 04 01 Managed Waste disposal
		6 A 2 Unmanaged Waste Disposal			09 04 02 Unmanaged Waste Disposal
		6 A 3 Other			09 04 03 Other
6 B WASTE WATER HANDLING	6 B	6 B WASTE WATER HANDLING			
		6 B 1 Industrial Waste Water			09 10 01 Waste water treatment in industry

Title	NFR sectors to be reported to Convention on Long-range Transboundary Air Pollution (CLRTAP)	UNFCCC CRF Reporting Detail	NFR Extension to CRF	UNFCCC CRF sectors excluded	CORINAIR/SNAP classification
		6 B 2 Domestic and Commercial Waste water 6 B 3 Other			09 10 02 Waste water treatment in residential and commercial sectors 09 10 07 Latrines
6 C WASTE INCINERATION	6 C	6 C WASTE INCINERATION (f)			09 02 01 and 09 02 02 Incineration of municipal/industrial wastes (f) 09 02 04 Flaring in chemical industry 09 02 05 Incineration of sludges from wastewater 09 02 07 Incineration of hospital wastes 09 02 08 Incineration of waste oil 09 07 Open burning of agricultural wastes (not on field) 09 09 Cremation (09.09.01 to 09.09.02)
6 D OTHER WASTE	6 D	6 D OTHER WASTE (g)			09 10 03 Sludge spreading 09 10 05 Compost production from waste 09 10 06 Biogas production 09 10 08 Other production of fuel (refuse derived fuel,...)
7 OTHER	7	7 OTHER			05 07 Geothermal energy extraction
Memo items (b)			International Aviation (LTO)		
	1 A 3 a i (i)		International Aviation (Cruise)		
	1 A 3 a i (ii)				
	1 A 3 d i		International Marine		
	5 E		5 E OTHER		
					11 08 Volcanoes

(a) Additional sectors split data are necessary to allocate this SNAP item into CRF/NFR sectors.

(b) To be reported separately as memo items at the bottom of reporting table IV 1A and 1B.

(c) Including Handling.

(d) Including NH3 from Enteric Fermentation.

(e) Including PM sources.

(f) Excludes waste incineration for energy (this is included in 1 A 1).

(g) Includes accidental fire.

Table III B: Aggregation of NFR codes to be used when preparing gridded data and LPS data

Categories for Gridding and LPS	NFR sector references (a)
01 Combustion in Power Plants and Industry	1 A 1 a Public Electricity and Heat Production 1 A 1 b Petroleum refining 1 A 1 c Manufacture of Solid fuels and Other Energy Industries 1 A 2 Manufacturing Industries and Construction
02a Transport above 1000m (b)	1 A 3 a ii (ii) Civil Aviation (Domestic, Cruise)
02b Transport below 1000m (b)	1 A 3 a ii (i) Civil Aviation (Domestic, LTO) 1 A 3 b Road Transportation 1 A 3 c Railways 1 A 3 d ii National Navigation 1 A 3 e Other (Please specify in a covering note) 1 A 5 b Other, Mobile (Including military)
03 Commercial Residential and Other Stationary Combustion	1 A 4 a Commercial / Institutional 1 A 4 b Residential 1 A 4 c Agriculture / Forestry / Fishing 1 A 5 a Other, Stationary (including Military)
04 Fugitive Emissions From Fuels	1 B 1 Fugitive Emissions from Solid Fuels 1 B 2 Oil and natural gas
05 Industrial Processes	2 A MINERAL PRODUCTS (c) 2 B CHEMICAL INDUSTRY 2 C METAL PRODUCTION 2 D OTHER PRODUCTION (c) 2 G OTHER (Please specify in a covering note) 7 OTHER
06 Solvent and Other Product Use	3 A PAINT APPLICATION 3 B DEGREASING AND DRY CLEANING 3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING 3 D OTHER including products containing HMs and POPs (Please specify)
07 Agriculture	4 B MANURE MANAGEMENT (d) 4 C RICE CULTIVATION 4 D 1 Direct Soil Emission 4 F FIELD BURNING OF AGRICULTURAL WASTES 4 G OTHER (e) 5 B FOREST AND GRASSLAND CONVERSION
08 Waste	6 A SOLID WASTE DISPOSAL ON LAND 6 B WASTE-WATER HANDLING 6 C WASTE INCINERATION (f) 6 D OTHER WASTE (g)
09 Other	OTHER (Please specify in a covering note)
Natural	5 E OTHER (h)

(a) For details see annex III (table IIIA) and annex IV (tables IV 1A and table IV 1B).

(b) NFR 1 A 3 a i, International Aviation, and NFR 1 A 3 d i, International Navigation, are excluded from the gridding.

(c) Including Product handling.

(d) Including NH₃ from Enteric Fermentation.

(e) Including PM sources.

(f) Exclude waste incineration for energy (this is included in 1 A 1 subsectors).

(g) Include accidental fires.

(h) To be reported separately as memo items at the bottom of the reporting tables IV 1A and IV 1B in annex IV.

Table III C: Fuels included in energy balance tables (see tables IV 2B and IV 2C in annex IV)

Fuel ^{a)}	IPCC fuel categories		NAPFUE (Nomenclature for Air Pollution of Fuels) codes
	Category	Subcategory	
Hard coal	Solid	Coking Coal	101
		Other Bituminous Coal	102
		Sub-Bituminous Coal	103
		Coke	Coke Oven Coke 107, 108
			Gas Coke 109
		BKB/Patent Fuel	Patent Fuel 104
Brown coal	Solid	Lignite	105
		Oil Shale	120
		BKB/Patent Fuel	Brown Coal Briquettes 106
		Peat	113
Other solid fuels	Other Fuels	Municipal Solid Waste	114,
		Industrial Waste	115, 116, 118, 119
Natural Gas	Gas	Natural Gas	301, 302
Derived gases ^{b)}	Solid	Derived Gases	Gas Works Gas 311, 312, 314
			Coke Oven Gas 304, 306
			Blast Furnace Gas 305
Heavy fuel oil ^{c)}	Liquid	Residual Fuel Oil	203
		Refinery Feedstock	217
		Petroleum Coke	110
Other liquid fuels ^{d)}	Liquid	Gas/Diesel Oil	204, 205
		Jet Kerosene	207
		Other Kerosene	206
		Gasoline	Motor Gasoline 208
			Aviation Gasoline 209
			Jet Gasoline
		Naphtha	210
		Natural Gas Liquids	
		Liquefied Petroleum Gas	303
		Orimulsion	
		Bitumen	222
		Lubricants	219
		Shale Oil	211
		Other Oil	Refinery Gas 307, 308
			Paraffin Waxes 221
			White Spirit 220
			Other 224
Hydrogen	<i>not available</i>		313
Biomass	Biomass	Solid	Wood ^{e)} 111
			Charcoal 112
			Vegetal Waste 117
	Liquid		Sulphur Lies 215
			Bio-alcohol ^{f)} 223
	Gas		Landfill Gas 309, 310
			Sludge Gas
Crude oil	Liquid	Crude Oil	201
Nuclear	<i>category not available</i>		<i>code not available</i>
Hydro	<i>category not available</i>		<i>code not available</i>
Renewable	<i>category not available</i>		<i>code not available</i>
Electricity	<i>category not available</i>		<i>code not available</i>
Heat	<i>category not available</i>		<i>code not available</i>

^{a)} "Fuel" column refers to the fuel categories used in tables IV 2B and IV 2C in annex IV to these guidelines.

^{b)} Includes gases produced from solid fuels.

^{c)} Includes also other heavy petroleum products.

^{d)} Includes also categories not specified in the IPCC, i.e. engine waste oil (NAPFUE 212, 213).

^{e)} Includes other crops if grown for energy use, e.g., elephant grass, willow scrub, grain.

^{f)} Includes other liquid bio-fuels, e.g. rape-seed oil, fish oil.

Table III D: Fuels included in transport energy consumption tables (see table IV 2D, annex IV)

Fuel ^{a)}	IPCC fuel categories		NAPFUE (Nomenclature for Air Pollution of Fuels) codes
	Category	Subcategory	
Petrol	Liquid	Gasoline	Motor Gasoline 208
			Aviation Gasoline 209
			Jet Gasoline
	Biomass	Naphtha	210
		Liquid	Bio-alcohol 223
Liquefied petroleum gas (LPG)	Liquid	Liquefied Petroleum Gas	303
Diesel	Liquid	Gas/Diesel Oil	204, 205
Compressed natural gas (CNG)	Gas	Natural Gas	301, 302
Hydrogen	<i>category not available</i>		313
Heavy fuel oil	Liquid	Residual Fuel Oil	203
Kerosene	Liquid	Jet Kerosene	207
		Other Kerosene	206

^{a)} "Fuel" column refers to the fuel categories used in table IV 2D in annex IV to these guidelines.

Annex IV

REPORTING FORMATS

A. General

This annex describes the forms for electronic reporting of emission data and related information under the Convention and specifies the data structure for files to be submitted to UNECE/EMEP. To simplify the task of preparing such files, each Party will be provided annually with ready-made template files for these forms with instructions on filling them. The reporting forms can also be downloaded from the EMEP web site (<http://www.emep.int>). Forms can be filled and returned to EMEP electronically. The table below¹ lists the downloadable forms; examples are illustrated in section D below (Reporting tables).

Table IVA: Recommended names of template files

National totals and NFR sector emissions for Main, PM and HMs	Table IV 1A
National totals and NFR sector emissions for POPs	Table IV 1B
Projected national total emissions of main pollutants	Table IV 2A
Energy consumption data	Table IV 2B
Electricity and heat production and consumption	Table IV 2C
Energy consumption data for transport sector	Table IV 2D
Agricultural activity data	Table IV 2E
Gridded national totals	Table IV 3A
Gridded aggregated NFR sector data	Table IV 3B
LPS data for each relevant aggregated NFR	Table IV 3C

Note: Parties should use the notation keys given in paragraph 29 to fill the tables; a field for a data value should never be left blank on the forms. This approach facilitates assessment of the completeness of emission data reports.

B. Text codes to be used

For the purpose of defining the context of all data values, a list of text codes is presented below. These text codes are grouped into the following categories:

- Text codes describing pollutants;
- Text codes describing energy consumption;
- Text codes describing emission source;
- Text codes describing unit;
- Text codes for describing point sources;
- Text codes for describing sources.
- Identification text codes.

The text codes play various roles in the data format. Some text codes may appear in more than one syntactical context. This is why the list of codes below is presented without explaining how the codes are used in the data format. This explanation will appear later as a part of the description of individual declaration lines. Each text code group is given a *syntactic notation*, which is used later in the specification to represent any member of the group.

Table IV B: Text codes

Text codes describing pollutants Syntactic notation <variables>	
Main components:	
SO _x	Sulphur oxides reported as SO ₂
NO _x	Nitrogen oxides reported as NO ₂
NH ₃	Ammonia
NMVOC	Non-methane volatile organic compounds
CO	Carbon monoxide
Particulate matter:	
TSP	Total suspended particulate matter
PM ₁₀	Particulate matter with diameter less than 10µm
PM _{2.5}	Particulate matter with diameter less than 2.5µm
Heavy metals:	
As	Arsenic
Cd	Cadmium
Cr	Chromium
Cu	Copper
Hg	Mercury
Ni	Nickel
Pb	Lead
Se	Selenium
Zn	Zinc
Persistent organic pollutants:	
HCH	Hexachlorocyclohexane (CAS: 608-73-1)
PCP	Pentachlorophenol (CAS: 87-86-5)
HCB	Hexachlorobenzene (CAS: 118-74-1)
DIOX	Dioxins and Furans
PAH	Polycyclic aromatic hydrocarbons
SCCP	Short-chained chlorinated paraffins (CAS: 85535-84-8)
PCB	Polychlorinated biphenyls
Aldrin	CAS: 309-00-2
Chlordane	CAS: 57-74-9
Chlordecone	CAS: 143-50-0
DDT	CAS: 50-29-3

1 All forms shown are text representations and may differ in appearance from the “on screen” electronic versions.

Persistent organic pollutants, continued:	
Dieldrin	CAS: 60-57-1
Endrin	CAS: 72-20-8
Heptachlor	CAS: 76-44-8
Hexabromobiphenyl	CAS: 36355-01-8
Mirex	CAS: 2385-85-5
Toxaphene	CAS: 8001-35-2

Text codes describing energy consumption Syntactic notation: <variables>	
Hard coal	
Brown coal	
Other solid fuels	
Natural Gas	
Derived gases	
Heavy fuel oil	
Other liquid fuels	
Biomass	

Text codes describing energy consumption Syntactic notation: <variables>	
Nuclear	
Hydro	
Renewables	
Electricity	
Heat	
Petrol	
LPG	Liquefied petroleum gas
Diesel	
CNG	Compressed natural gas
Heavy fuel oil	
Kerosene	
Head	Number of animals (used for agricultural activity data)
N	Nitrogen (used for agricultural activity data)

Text codes describing emission source (anthropogenic total or NFR codes) Syntactic notation: <source>	
TOT	National Total
Sectors (NFR)	
1 A 1 a	1 A 1 a Public Electricity and Heat Production
1 A 1 b	1 A 1 b Petroleum refining
1 A 1 c	1 A 1 c Manufacture of Solid fuels and Other Energy Industries
1 A 2	1 A 2 Manufacturing Industries and Construction
1 A 2 a	1 A 2 a Iron and Steel
1 A 2 b	1 A 2 b Non-ferrous Metals
1 A 2 c	1 A 2 c Chemicals
1 A 2	1 A 2 Manufacturing Industries and Construction, continued
1 A 2 d	1 A 2 d Pulp, Paper and Print
1 A 2 e	1 A 2 e Food Processing, Beverages & Tobacco
1 A 2 f	1 A 2 f Other (Please specify in a covering note)

1 A 3 a ii (i)	1 A 3 a ii Civil Aviation (Domestic, LTO)
1 A 3 a ii (ii)	1 A 3 a ii Civil Aviation (Domestic, Cruise)
1 A 3 b	1 A 3 b Road Transportation
1 A 3 b i	1 A 3 b i R.T., Passenger cars
1 A 3 b ii	1 A 3 b ii R.T., Light duty vehicles
1 A 3 b iii	1 A 3 b iii R.T., Heavy duty vehicles
1 A 3 b iv	1 A 3 b iv R.T., Mopeds and Motorcycles
1 A 3 b v	1 A 3 b v R.T., Gasoline evaporation
1 A 3 b vi	1 A 3 b vi R.T., Automobile tire and brake wear
1 A 3 b vii	1 A 3 b vii R.T., Automobile road abrasion
1 A 3 c	1 A 3 c Railways
1 A 3 d ii	1 A 3 d ii National Navigation
1 A 3 e	1 A 3 e Other (Please specify in a covering note)
1 A 3 e i	1 A 3 e i Pipeline compressors
1 A 3 e ii	1 A 3 e ii Other mobile sources and machinery
1 A 4 a	1 A 4 a Commercial / Institutional
1 A 4 b	1 A 4 b Residential
1 A 4 b I	1 A 4 b i Residential plants
1 A 4 b ii	1 A 4 b ii Household and gardening (mobile)
1 A 4 c	1 A 4 c Agriculture / Forestry / Fishing
1 A 4 c I	1 A 4 c i Stationary
1 A 4 c ii	1 A 4 c ii Off-road Vehicles and Other Machinery
1 A 4 c iii	1 A 4 c iii National Fishing
1 A 5 a	1 A 5 a Other, Stationary (including Military)

Text codes describing emission source (anthropogenic total or NFR codes)	
Syntactic notation: <source>	
1 A 5 b	1 A 5 b Other, Mobile (Including military)
1 B 1	1 B 1 Fugitive Emissions from Solid Fuels
1 B 1 a	1 B 1 a Coal Mining and Handling
1 B 1 b	1 B 1 b Solid fuel transformation
1 B 1 c	1 B 1 c Other (Please specify in a covering note)
1 B 2	1 B 2 Oil and natural gas
1 B 2 a	1 B 2 a Oil
1 B 2 a i	1 B 2 a i Exploration Production, Transport
1 B 2 a iv	1 B 2 a iv Refining / Storage
1 B 2 a v	1 B 2 a v Distribution of oil products
1 B 2 a vi	1 B 2 a vi Other
1 B 2 b	1 B 2 b Natural gas
1 B 2 c	1 B 2 c Venting and flaring

2 A	2 A MINERAL PRODUCTS (a)
2 A 1	2 A 1 Cement Production
2 A 2	2 A 2 Lime Production
2 A 3	2 A 3 Limestone and Dolomite Use
2 A 4	2 A 4 Soda Ash Production and use
2 A 5	2 A 5 Asphalt Roofing
2 A 6	2 A 6 Road Paving with Asphalt
2 A 7	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)
2 B	2 B CHEMICAL INDUSTRY
2 B 1	2 B 1 Ammonia Production
2 B 2	2 B 2 Nitric Acid Production
2 B 3	2 B 3 Adipic Acid Production
2 B 4	2 B 4 Carbide Production
2 B 5	2 B 5 Other (Please specify in a covering note)
2 C	2 C METAL PRODUCTION
2 D	2 D OTHER PRODUCTION (a)
2 D 1	2 D 1 Pulp and Paper
2 D 2	2 D 2 Food and Drink
2 G	2 G OTHER (Please specify in a covering note)
3 A	3 A PAINT APPLICATION
3 B	3 B DEGREASING AND DRY CLEANING
3 C	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING
3 D	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)
4 B	4 B MANURE MANAGEMENT (b)
4 B 1	4 B 1 Cattle
4 B 1 a	4 B 1 a Dairy
4 B 1 b	4 B 1 b Non-Dairy
4 B 2	4 B 2 Buffalo
4 B 3	4 B 3 Sheep
4 B 4	4 B 4 Goats
4 B 5	4 B 5 Camels and Llamas
4 B 6	4 B 6 Horses
4 B 7	4 B 7 Mules and Asses
4 B 8	4 B 8 Swine
4 B 9	4 B 9 Poultry
4 B 13	4 B 13 Other

Text codes describing emission source (anthropogenic total or NFR codes)	
Syntactic notation: <source>	
4 C	4 C RICE CULTIVATION
4 D	4 D AGRICULTURAL SOILS
4 D 1	4 D 1 Direct Soil Emission
4 D	4 D AGRICULTURAL SOILS, continued
4 F	4 F FIELD BURNING OF AGRICULTURAL WASTES
4 G	4 G OTHER (c)

5 B	5 B FOREST AND GRASSLAND CONVERSION
6 A	6 A SOLID WASTE DISPOSAL ON LAND
6 B	6 B WASTEWATER HANDLING
6 C	6 C WASTE INCINERATION (d)
6 D	6 D OTHER WASTE (e)
7	7 OTHER

Text codes describing unit Syntactic notation: <unit>	
g I-Teq	Grams of toxic equivalent
kg	Kilograms
Mg	Megagrams = metric tons
Gg	Gigagrams = kilotons = 1000 metric tons
TJ	Terajoules = 10 ¹² joules

Text codes for describing point sources Syntactic notation: <variables>	
LPS	Full name of the source
Latitude	Latitude of source given as degrees with decimal digits (i.e. 50.5 corresponds to 50 degrees and 30 minutes)
Longitude	Longitude of source given as degrees with decimal digits
NFR	Relevant aggregated NFR source sector for the point source
Height	Physical height of stack (metres)

Text codes for describing sources Syntactic notation : <variables>	
I	The I coordinate of the 50*50 km EMEP grid
J	The J coordinate of the 50*50 km EMEP grid
DESCRIPTION	Description of NFR sector
COMMENTS	General comment
SOURCE	Identification of emission source (text code for NFR sector)
Identification text codes	
YEAR	A four-digit number representing the emission/consumption/activity year. Examples: 1980, 1995, 2000
REPORTED	Date of reporting. Example: 31.12.2001
COUNTRY	Name of the reporting country
TABLE	Name of table

C. Checklist of reporting tables

The following table may be used as a checklist to aid Parties in their reporting.

Table IV C: Checklist of reporting tables (to be made available on EMEP home page)

Description of contents	Corresponding EXCEL file	COMPONENT	Reported for Year (s)/Not Reported (NR)	Comments
MINIMUM REPORTING / YEARLY		To be filled in by Party	To be filled in by Party	To be filled in by Party
National totals and NFR sector emissions for main pollutants, PM, HM	Table IV 1A			
National totals and NFR sector emissions for POPs	Table IV 1B			
MINIMUM REPORTING/FIVE-YEARLY				
Projected national total emissions of main pollutants	Table IV 2A			
Energy consumption data	Table IV 2B			
Electricity and heat production and consumption	Table IV 2C			
Energy consumption data for transport sector	Table IV 2D			
Agricultural activity data	Table IV 2E			
Gridded national totals	Table IV 3A			
Gridded sector data for each of the relevant aggregated NFR sectors	Table IV 3B			
LPS data for each relevant aggregated NFR	Table IV 3C			
ADDITIONAL REPORTING (REVIEW)				
VOC speciation				
Height distribution				
Land-use data				
Mercury breakdown				
% of toxic congeners of PCDD/F				
Pre-1990 emissions of PAHs, HCB, PCDD/F and PCB				
Other heavy metals				
Other POPs				

Section D: Reporting tables
(to be made available on EMEP home page)

TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals

COUNTRY:
REPORTED:
YEAR:

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Heavy metals			Other metals					
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO ₂	Gg	Gg	Gg SO ₂	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 1 a	(a)	1 A 1 a Public Electricity and Heat Production	A																	
1 A 1 b	(a)	1 A 1 b Petroleum refining																		
1 A 1 c	(a)	1 A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
1 A 2	(a)	1 A 2 Manufacturing Industries and Construction	A																	
1 A 2 a	(a)	1 A 2 a Iron and Steel																		
1 A 2 b	(a)	1 A 2 b Non-ferrous Metals																		
1 A 2 c	(a)	1 A 2 c Chemicals																		
1 A 2 d	(a)	1 A 2 d Pulp, Paper and Print																		
1 A 2 e	(a)	1 A 2 e Food Processing, Beverages and Tobacco																		
1 A 2 f	(a)	1 A 2 f Other (Please specify in a covering note)																		
1 A 3 a ii (i)		1 A 3 a ii Civil Aviation (Domestic, LTO)																		
1 A 3 a ii (ii)		1 A 3 a ii Civil Aviation (Domestic, Cruise)																		
1 A 3 b	(a)	1 A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting					
			Main Pollutants					Particulate matter			Priority metals		Other metals					
			NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
Gg NO ₂	Gg	Gg	Gg SO ₂	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
1 A 3 b i		1 A 3 b i R.T., Passenger cars																
1 A 3 b ii		1 A 3 b ii R.T., Light duty vehicles																
1 A 3 b iii		1 A 3 b iii R.T., Heavy duty vehicles																
1 A 3 b iv		1 A 3 b iv R.T., Mopeds & Motorcycles																
1 A 3 b v		1 A 3 b v R.T., Gasoline evaporation																
1 A 3 b vi		1 A 3 b vi R.T., Automobile tyre and brake wear																
1 A 3 b vii		1 A 3 b vii R.T., Automobile road abrasion																
1 A 3 c	(a)	1 A 3 c Railways																
1 A 3 d ii		1 A 3 d ii National Navigation																
1 A 3 e	(a)	1 A 3 e Other (Please specify in a covering note)	A															
1 A 3 e i		1 A 3 e i Pipeline compressors																
1 A 3 e ii		1 A 3 e ii Other mobile sources and machinery																
1 A 4 a	(a)	1 A 4 a Commercial / Institutional																
1 A 4 b	(a)	1 A 4 b Residential	A															
1 A 4 b i		1 A 4 b i Residential plants																
1 A 4 b ii		1 A 4 b ii Household and gardening (mobile)																

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting					
				Main Pollutants					Particulate matter			Priority metals		Other metals					
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
Gg NO ₂	Gg	Gg	Gg SO ₂	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg		
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																
1 A 4 c i		1 A 4 c i Stationary																	
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery																	
1 A 4 c iii		1 A 4 c iii National Fishing																	
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)																	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)																	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																	
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																	
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																	
1 B 2	(a)	1 B 2 Oil and natural gas	A																
1 B 2 a	(a)	1 B 2 a Oil	A																
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																	
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																	
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products																	
1 B 2 a vi	(a)	1 B 2 a vi Other																	
1 B 2 b	(a)	1 B 2 b Natural gas																	
1 B 2 c	(a)	1 B 2 c Venting and flaring																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO ₂	Gg	Gg	Gg SO ₂	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b)	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b)	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO ₂	Gg	Gg	Gg SO ₂	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING																		
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																		
4 B	(a)	4 B MANURE MANAGEMENT A (c)																		
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO ₂	Gg	Gg	Gg SO ₂	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission																		
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
		National Total																		
Memo Items																				
1 A 3 a i (i)	(a)	International Aviation (LTO)																		
1 A 3 a i (ii)	(a)	International Aviation (Cruise)																		
1 A 3 d i	(a)	International Navigation																		
5 E	(a)	5 E Other																		
X		X (11 08 Volcanoes)																		

(a) Sectors already reported to UNFCCC for NO_x, CO, NMVOC, SO₂.

(b) Including Product handling.

(c) Including NH₃ from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

TABLE IV 1B: National sector emissions: Persistent organic pollutants

COUNTRY:
REPORTED:
YEAR:

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting																	Additional reporting					
			ANNEX I (1)								ANNEX II (2)		ANNEX III (3)							OTHER (4)					
			kg Aldrin	kg Chlordane	kg Chlordecone	kg Dieldrin	kg Endrin	kg Heptachlor	kg Hexabromo-biphenyl	kg Mirex	kg Toxaphene	kg HCH	kg DDT	kg I-Teq	DIOX	PAH					Total 1-4	kg HCB	kg PCP	kg SCCP	
																benzo(a)pyrene	benzo(b)fluoranthene	benzo(k)fluoranthene	Indeno (1,2,3-cd)pyrene						
1 A 1 a	1 A 1 a Public Electricity and Heat Production																								
1 A 1 b	1 A 1 b Petroleum refining																								
1 A 1 c	1 A 1 c Manufacture of Solid fuels and Other Energy Industries																								
1 A 2	1 A 2 Manufacturing Industries and Construction	A																							
1 A 2 a	1 A 2 a Iron and Steel																								
1 A 2 b	1 A 2 b Non-ferrous Metals																								
1 A 2 c	1 A 2 c Chemicals																								
1 A 2 d	1 A 2 d Pulp, Paper and Print																								
1 A 2 e	1 A 2 e Food Processing, Beverages & Tobacco																								
1 A 2 f	1 A 2 f Other (Please specify in a covering note)																								
1 A 3 a ii (i)	1 A 3 a ii Civil Aviation (Domestic, LTO)																								
1 A 3 a ii (ii)	1 A 3 a ii Civil Aviation (Domestic, Cruise)																								
1 A 3 b	1 A 3 b Road Transportation	A																							
1 A 3 b i	1 A 3 b i R.T., Passenger cars																								
1 A 3 b ii	1 A 3 b ii R.T., Light duty vehicles																								
1 A 3 b iii	1 A 3 b iii R.T., Heavy duty vehicles																								
1 A 3 b iv	1 A 3 b iv R.T., Mopeds & Motorcycles																								
1 A 3 b v	1 A 3 b v R.T., Gasoline evaporation																								
1 A 3 b vi	1 A 3 b vi R.T., Automobile tyre and brake wear																								
1 A 3 b vii	1 A 3 b vii R.T., Automobile road abrasion																								
1 A 3 c	1 A 3 c Railways																								
1 A 3 d ii	1 A 3 d ii National Navigation																								
1 A 3 e	1 A 3 e Other (Please specify in a covering note)	A																							
1 A 3 e i	1 A 3 e i Pipeline compressors																								
1 A 3 e ii	1 A 3 e ii Other mobile sources and machinery																								
1 A 4 a	1 A 4 a Commercial / Institutional																								
1 A 4 b	1 A 4 b Residential	A																							
1 A 4 b i	1 A 4 b i Residential plants																								
1 A 4 b ii	1 A 4 b ii Household and gardening (mobile)																								
1 A 4 c	1 A 4 c Agriculture / Forestry / Fishing	A																							
1 A 4 c i	1 A 4 c i Stationary																								

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting																Additional reporting				
			ANNEX I (1)								ANNEX II (2)		ANNEX III (3)						OTHER (4)				
			kg Aldrin	kg Chlordane	kg Chlordecone	kg Dieldrin	kg Endrin	kg Heptachlor	kg Hexabromo-biphenyl	kg Mirex	kg Toxaphene	kg HCH	kg DDT	ng I-Teq DIOX	PAH					kg HCB	kg PCP	kg SCCP	
															benzo(a) pyrene	benzo(b) fluoranthene	benzo(k) fluoranthene	Indeno (1,2,3-cd) pyrene	Total 1-4				
1 A 4 c ii	1 A 4 c ii Off-road Vehicles and Other Machinery																						
1A 4 c iii	1A 4 c iii National Fishing																						
1 A 5 a	1 A 5 a Other, Stationary (including Military)																						
1 A 5 b	1 A 5 b Other, Mobile (Including military)																						
1B1	1B1 Fugitive Emissions from Solid Fuels	A																					
1 B 1 a	1 B 1 a Coal Mining and Handling																						
1 B 1 b	1 B 1 b Solid fuel transformation																						
1 B 1 c	1 B 1 c Other (Please specify in a covering note)																						
1 B 2	1 B 2 Oil and natural gas	A																					
1 B 2 a	1 B 2 a Oil	A																					
1 B 2 a i	1 B 2 a i Exploration Production, Transport																						
1 B 2 a iv	1 B 2 a iv Refining / Storage																						
1 B 2 a v	1 B 2 a v Distribution of oil products																						
1 B 2 a vi	1 B 2 a vi Other																						
1 B 2 b	1 B 2 b Natural gas																						
1 B 2 c	1 B 2 c Venting and flaring																						
2 A	2 A MINERAL PRODUCTS (a)	A																					
2 A 1	2 A 1 Cement Production																						
2 A 2	2 A 2 Lime Production																						
2 A 3	2 A 3 Limestone and Dolomite Use																						
2 A 4	2 A 4 Soda Ash Production and use																						
2 A 5	2 A 5 Asphalt Roofing																						
2 A 6	2 A 6 Road Paving with Asphalt																						
2 A 7	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																						
2 B	2 B CHEMICAL INDUSTRY	A																					
2 B 1	2 B 1 Ammonia Production																						
2 B 2	2 B 2 Nitric Acid Production																						
2 B 3	2 B 3 Adipic Acid Production																						
2 B 4	2 B 4 Carbide Production																						
2 B 5	2 B 5 Other (Please specify in a covering note)																						
2 C	2 C METAL PRODUCTION																						
2 D	2 D OTHER PRODUCTION (a)	A																					

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting																Additional reporting					
			ANNEX I (1)								ANNEX II (2)		ANNEX III (3)						OTHER (4)					
			kg Aldrin	kg Chlordane	kg Chlordecone	kg Dieldrin	kg Endrin	kg Heptachlor	kg Hexabromo-biphenyl	kg Mirex	kg Toxaphene	kg HCH	kg DDT	g I-Teq DIOX	PAH					kg HCB	kg PCP	kg SCCP		
															kg benzo(a) pyrene	kg benzo(b) fluoranthene	kg benzo(k) fluoranthene	kg Indeno (1,2,3-cd) pyrene	kg Total 1-4					
1 a 3 d i	International Marine (b)																							
5 E	5 E Other																							
X	X (11 08 Volcanoes)																							

- (a) Including Handling;
 (b) Including NH3 from Enteric Fermentation;
 (c) Including PM sources;
 (d) Excludes waste incineration for energy (this is included in 1 A 1);
 (e) Includes accidental fires.

Notes 1: POPs should cover the timespan from 1990 to the latest year.

(1): The POPs listed in annex I to the Protocol on POPs are substances scheduled for elimination; DDT and PCBs are also listed in annex I;

(2): The POPs listed in annex II to the Protocol on POPs are substances scheduled for restrictions on use;

(3): The POPs listed in annex III to the Protocol on POPs are substances referred to in article 3, para. 5 (a), of the Protocol. Polycyclic aromatic hydrocarbons (PAHs): For the purpose of the emission inventories, the following four indicator compounds should be used: benzo(b)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene. HCB is also included in annex I to the Protocol as a substance for elimination.

(4): See article 8 of the Protocol (Research, development and monitoring; reporting voluntary).

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

TABLE IV 2A: Five-yearly, Minimum reporting of projected national total emissions of main pollutants

COUNTRY:

REPORTED:

	UNIT	Current legislation projections ^{a)}			Current reduction plans		
Pollutant:		2010	2015	2020	2010	2015	2020
Sulphur oxides (SO _x as SO ₂)	Gg						
Nitrogen oxides (NO _x as NO ₂)	Gg						
Non-methane volatile organic compounds (NMVOC)	Gg						
Ammonia (NH ₃)	Gg						

^{a)} Current legislation projections should be based on the activity projections as reported in tables IV 2B, IV 2C, IV 2D, and IV 2E in annex IV.

Note:

For the definition of ‘current legislation projections’ and ‘current reduction plans’ please refer to paragraph 24 of the guidelines (chap. V).

TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data

COUNTRY:
REPORTED:
YEAR:

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants													
NFR 1A1b,c	Conversion													
NFR 1A2a-f	Industry													
NFR 1A4a,bi,ci	Residential/Commercial													
NFR 1A3aii,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport													
	Non-energy use ^{a)}													
	TOTAL													
Refinery input														

^{a)} Should include use of all fuels, including feedstocks for petrochemical industry.

Notes: Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.
Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy, i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above. If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

TABLE IV 2C: Five-yearly, Minimum reporting of electricity and heat production and consumption

COUNTRY:

REPORTED:

YEAR:

SOURCE/FUEL:		Electricity	Heat
UNIT:		TJ	TJ
Gross production			
Own use and losses ^{a)}			
Import – Export ^{b)}			
<i>Final consumption</i>			
NFR 1A2a-f	Industry		
NFR 1A4a,bi,ci	Residential/Commercial		
NFR 1A3ai,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport		
	TOTAL		

^{a)} Includes own use in power plants and conversion sector (NFR 1A1a,b,c) and transmission and distribution losses.

^{b)} Please indicate the sign, i.e. if Exports are larger than Imports the number given should be negative.

Notes:

¹ If data in the statistics are reported in GWh they can be converted to TJ, i.e. 1 GWh = 3.6 TJ.

² Electricity and heat production and consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above. If data on final consumption are not available for this sectoral resolution, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector

COUNTRY:
REPORTED:
YEAR:

SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars							
NFR 1A3bii	Light Duty Vehicles							
NFR 1A3biii	Heavy Duty Vehicles							
NFR 1A3biv	Mopeds and Motorcycles							
NFR 1A3c	Railways							
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road							
NFR 1A3aai	Civil Aviation							
NFR 1A3dii + 1A4ciii	National Shipping							
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation							
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road							
NFR 1A3aai	Civil Aviation							
NFR 1A3dii + 1A4ciii	National Shipping							
TOTAL								

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines. Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.

TABLE IV 2E: Five-yearly, Minimum reporting of agricultural activity data

COUNTRY:

REPORTED:

YEAR:

SOURCE/UNIT :		head	N
		1000	Gg
NFR 4B1a	Dairy Cattle; Slurry-based system		
NFR 4B1a	Dairy Cattle; Straw-based system		
NFR 4B1b	Non-Dairy Cattle; Slurry-based system		
NFR 4B1b	Non-Dairy Cattle; Straw-based system		
NFR 4B3	Sheep		
NFR 4B4	Goats		
NFR 4B6	Horses		
NFR 4B7	Mules and Asses		
NFR 4B8	Swine; Slurry-based system		
NFR 4B8	Swine; Straw-based system		
NFR 4B9	Laying Hens		
NFR 4B9	Broilers		
NFR 4B9	Turkeys		
NFR 4B9	Other Poultry		
NFR 4B13	Other Animals		
NFR 4Di	N-fertilizer use – Urea		
NFR 4Di	N-fertilizer use - other N-fertilizers		
<i>Aggregated categories</i>			
NFR 4B1a	Dairy Cattle		
NFR 4B1b	Non-Dairy Cattle		
NFR 4B3,4	Sheep and Goats		
NFR 4B6,7,13	Horses, Mules and Asses, Other		
NFR 4B8	Swine		
NFR 4B9	Poultry		
NFR 4Di	N-fertilizer use		

Note:

If possible, both historical (1990, 1995 and 2000) and projection data (2010, 2015 and 2020) should be reported in this format. Whenever disaggregated data are not available, the aggregated format can be used for both historical and projection data. For example, if it is not possible to provide split into slurry and straw systems, report total number of animals only. Similarly for poultry or nitrogen (N) fertilizer use, aggregates should be reported if data on lower resolution could not be found.

COUNTRY:
REPORTED:
YEAR:

Notes:

i and j correspond to the EMEP grid.
Shaded components are additional reporting.

Table IV 3B: Template file for gridded sector data for each of the relevant aggregated NFR sectors (see table III B)

COUNTRY:
REPORTED:
YEAR:

VARIABLES:	i.	j.	NFR aggregated sectors	SOx (as SO2)	NOx (as NO2)	NH3	NM VOC	CO	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	Aldrin	Chlordane	Chlordecone	Dieldrin	Endrin	Heptachlor	Hexabromobiphenyl	Mirex	Toxaphene	HCH	DDT	PCB	DIOX	PAH	HCB	PCP	SCCP
UNIT:				Gg	Gg	Gg	Gg	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	g I-Teq	Mg	kg	kg	kg

Notes:

1. i and j correspond to the EMEP grid
2. Shaded components are additional reporting
3. NFR aggregated sector must be named 01,02a, 02b, 03, 04, 05, 06, 07, 08, 09 or Natural.

TABLE IV 3C: Template file for LPS data for each relevant aggregated NFR

COUNTRY:
REPORTED:
YEAR:

	LPS	NFR	i	j	longitude	latitude	height	SOx (as SO2)					NOx (as NO2)					NH3					NMVOC					CO				
Height class								1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Unit					deg	deg	m	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
	Name of LPS1																															
	Name of LPS2																															
	Name of LPS3																															

TSP					PM10					PM2.5					Pb					Cd				
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg

TABLE IV 3C: Template file for LPS data for each relevant aggregated NFR, continued

Hg					DIOX					PAH					HCB				
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Mg	Mg	Mg	Mg	Mg	g I-Teq	g I-Teq	g I-Teq	g I-Teq	g I-Teq	Mg	Mg	Mg	Mg	Mg	Kg	Kg	Kg	Kg	Kg

Notes:

- The file may contain any number of LPS categories. Height classes of physical height of emission:
 - below 45 metres;
 - between 45 and 100 metres;
 - between 100 and 150 metres;
 - between 150 and 200 metres;
 - above 200 metres.
- NFR means relevant NFR category (aggregated).
- Longitude and latitude are both given as degrees with decimal digits [i.e. 50.5 corresponds to 50 degree and 30 minutes].
- The compounds shaded in tables IV 3A and IV 3B may be reported as additional reporting.
- NFRs must be named 01, 02a, 02b, 03, 04, 05, 06, 07, 08, 09 or Natural

Annex VTHE EMEP 50x50 km² GRID

According to the definition given in the Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP): “*The geographical scope of EMEP means the area within which, coordinated by the international centres of EMEP, monitoring is carried out.*” This definition has been referred to in all following protocols to the Convention. Since its adoption in 1984, as Parties have ratified or acceded to the EMEP Protocol, the geographical scope of EMEP has broadened.

The present EMEP grid domain is depicted in the figure at 50x50 km² resolution. The technical description of the grid can be found below. In addition, the following files with relevant information are available on the EMEP web site: <http://www.emep.int/>

Trans. f : Fortran code to convert from EMEP grid coordinates to geographical (longitude-latitude) coordinates.

EMEP grid. data : ASCII file which defines the geographical coordinates and area of each EMEP grid point.

Technical description of the EMEP grid

The EMEP grid system is based on a polar-stereographic projection with real area at latitude 60° N. The y-axis is oriented parallel to 32° W defined as a negative longitude if west of Greenwich. The EMEP 50x50 km² domain includes 132x111 points (with x varying from 1 to 132 and y varying from 1 to 111).

For the **50x50 km² grid**, the latitude, ϕ , and longitude, λ , of any point (x, y) on the grid may be calculated as follows:

$$\phi = 90 - \frac{360}{\pi} \arctan \left[\frac{r}{M} \right]$$

$$\lambda = \lambda_0 + \frac{180}{\pi} \arctan \left[\frac{x - x_{pol}}{y_{pol} - y} \right]$$

in which:	xpol	= 8	(x coordinate of the North Pole)
	ypol	= 110	(y coordinate of the North Pole)
	d	= 50 km	(grid length at 60° N)
	ϕ_0	= 60° N = $\pi/3$	(defining latitude)
	R	= 6370 km	(radius of earth)

$$\begin{aligned} M &= R/d[1 + \sin(\phi_0)] && \text{(Number of grid distances between the} \\ &= 237.73 && \text{North Pole and the equator)} \end{aligned}$$

$$r = \sqrt{(x - x_{pol})^2 + (y - y_{pol})^2}$$

$$\lambda_0 = -32 \text{ (32}^\circ \text{ W)} \quad \text{(rotation angle, i.e. the longitude parallel to the y-axis)}$$

The x and y coordinate in the EMEP grid of any given latitude and longitude can be found from:

$$x = x_{pol} + M \tan \left[\frac{\pi}{4} - \frac{\phi}{2} \right] \sin(\lambda - \lambda_0)$$

$$y = y_{pol} - M \tan \left[\frac{\pi}{4} - \frac{\phi}{2} \right] \cos(\lambda - \lambda_0)$$

It should be pointed out that x and y coordinates calculated with the equations above coincide with the grid-square centre. Thus, if a grid-square has its centre coordinates (x,y), the coordinates of its lower left and right corners are (x-0.5, y-0.5) and (x+0.5, y-0.5) respectively, and the coordinates (x,y) of its upper left and right corners are (x-0.5, y+0.5) and (x+0.5, y+0.5) respectively.

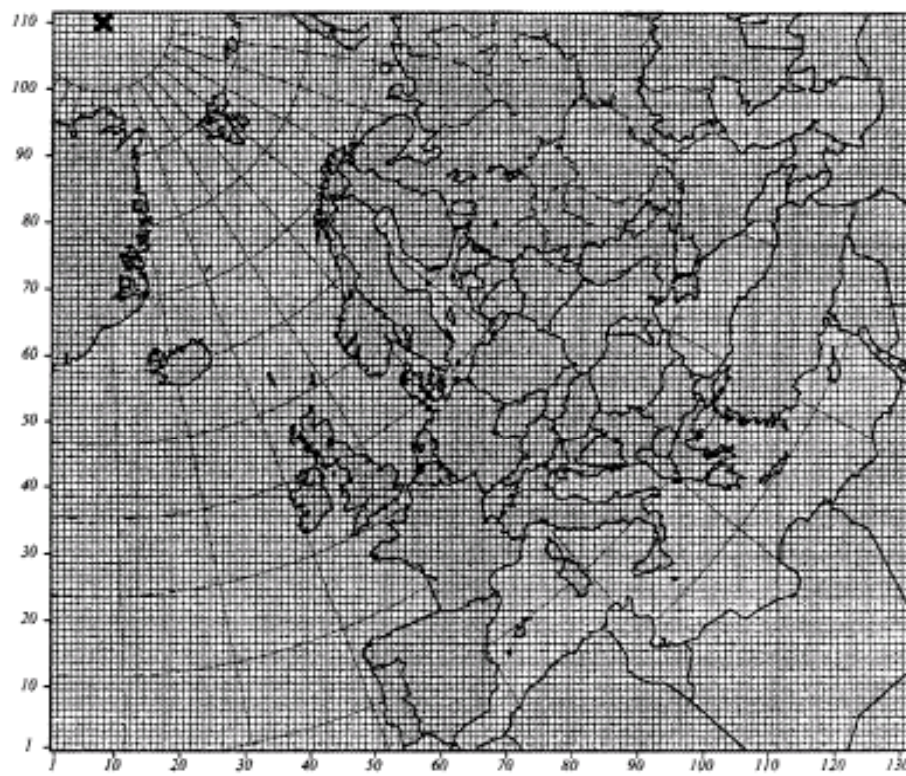


Figure V 1: Present extent of the EMEP 50x50km² grid

The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations.

Annex VI

REFERENCES

1. The latest version of the guidebook, after approval by the Executive Body, is made available on the Internet site of the European Environment Agency (<http://reports.eea.eu.int/EMEPCORINAIR/en>) and can also be accessed from the EMEP web site (<http://www.emep.int>).
2. Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories and the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.
3. The Integrated Pollution Prevention and Control (IPPC) European Pollutant Emission Register (EPER) adopted by the European Community (EC) in November 1999.
4. The Guidelines for Emission Inventory Reporting from the Large Combustion Plant Directive, EEC/88/609.
5. The Organisation for Economic Co-operation and Development (OECD) and Pollution Release and Transfer Register (PRTR) Guidance.
6. The Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, United States Environmental Protection Agency, January 1995.
7. Emissions Inventory Improvement Programme, United States Environmental Protection Agency (<http://www.epa.gov/ttn/chief/eiip>).
8. HARP-HAZ. Harmonized Quantification and Reporting Procedures for Hazardous Substances (<http://www.sft.no/english/harphaz/>).