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**ECONOMIC COMMISSION FOR EUROPE**

EXECUTIVE BODY FOR THE CONVENTION ON LONG-RANGE  
TRANSBOUNDARY AIR POLLUTION

**GUIDELINES FOR REPORTING EMISSION DATA UNDER THE CONVENTION ON  
LONG-RANGE TRANSBOUNDARY AIR POLLUTION**

**Note by the secretariat**

At its thirty-first session, (3–5 September 2007), the Steering Body of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) approved the technical aspects of the draft Guidelines (ECE/EB.AIR/GE.1/2007/15) as revised by the Task Force on Emission Inventories and Projections. In line with the request of the Executive Body made at its twenty-fifth session, (10–13 December 2007) and following consultations with an ad hoc group of legal experts, the Working Group on Strategies and Review further revised the Guidelines at its forty-first session (14–17 April 2008) and forwarded them to the Executive Body for approval.

At its twenty-sixth session (15–18 December 2008), the Executive Body approved the revised Guidelines (ECE/EB.AIR/2008/4) as amended at the session and requested the secretariat to circulate a final amended version.

The present document, circulated with a new symbol for practical reasons, contains the final amended version of the Guidelines as approved by the Executive Body.

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<sup>1</sup> Annexes II to VII to these Guidelines are available online at: <http://www.ceip.at/reporting-instructions/>. They are: II. Table of base years and years of ratification by Party and by protocol; III. Aggregation of Nomenclature for Reporting Codes (NFR) for gridded and Large Point Source (LPS) data; IV. Reporting templates; V. The EMEP emissions reporting grid; VI. Informative Inventory Report (IIR) and VII. References.

## **I. OBJECTIVES**

1. The objectives of these Guidelines are as follows:
  - (a) To assist Parties, through a common approach, in meeting their obligations under the 1979 Geneva Convention on Long-range Transboundary Air Pollution (hereinafter “the Convention”) and its protocols;
  - (b) To support the evaluation of emission reduction strategies;
  - (c) To facilitate the technical review of air pollutant emission inventories, in accordance with the methods and procedures for the technical review of air pollutant emission inventories reported under the Convention and its protocol (EB.AIR/GE.1/2007/16) approved by the Executive Body at its twenty-fifth session (ECE/EB.AIR/91, para. 27 (m));
  - (d) To allow for the effective assessment of compliance with emission obligations under Protocols by the Convention’s Implementation Committee;
  - (e) To facilitate the harmonization of emission reporting with reporting under other relevant multilateral environmental agreements and relevant European Community legislation.

## **II. PRINCIPLES AND DEFINITIONS**

2. The legal standing of the parts of the Guidelines that have legally binding effect is based on Executive Body decisions 2002/10, 2005/1 and 2008/[16], adopted at its twentieth, twenty-third and twenty-sixth sessions respectively, and on emission data reporting obligations under the Convention and the protocols in force. However, the Executive Body may adopt subsequent decisions to alter, strengthen further or otherwise clarify the legal basis of the Guidelines, but only in virtue of specific treaty provisions (enabling clauses) giving them such effect. The Guidelines should not be understood to imply that a specific Protocol applies to a Party to the Convention that is not a Party to that Protocol.
3. The term “Parties” in the Guidelines refers to Parties to the Convention, unless otherwise specified.
4. National emission inventories and projected emissions should be transparent, consistent, comparable, complete and accurate. In the context of the present Guidelines:

(a) “Transparency” means that Parties should provide clear documentation and report a level of disaggregation that sufficiently allows individuals or groups other than the designated emission expert or the compiler of the inventory or projection to understand how the inventory was compiled and assure it meets good practice requirements. The transparency of reporting is fundamental to the effective use, review and continuous improvement of the inventory and projection;

(b) “Consistency” means that estimates for any different inventory years, gases and source categories are made in such a way that differences in the results between years and source categories reflect real differences in emission estimates. Annual emissions, as far as possible, should be calculated using the same method and data sources for all years, and resultant trends should reflect real fluctuations in emissions and not the changes resulting from methodological differences. Consistency also means that, as far as practicable and appropriate, the same data are reported under different international reporting obligations. For projections, consistency means that a year of the submitted inventory is used as a basis;

(c) “Comparability” means that the national inventory and projection is reported in such a way that allows it to be compared with other Parties. This can be achieved by using accepted methodologies as elaborated in section V below, by using the reporting templates and through the use of the harmonized Nomenclature for Reporting (NFR), as specified in annex III to these Guidelines;

(d) “Completeness” means that estimates are reported for all pollutants, all relevant source categories and all years and for the entire territorial areas of Parties covered by the reporting requirements set forth in the provisions of the Convention and its protocols. Where numerical information on emissions under any source category is not provided, the appropriate notation key defined in section II.C of annex I to these Guidelines should be used when filling in the reporting template and their absence should be documented;

(e) “Accuracy” means that emissions are neither systematically overestimated nor underestimated, as far as can be judged. This implies that Parties will endeavour to remove bias from the inventory estimates and minimize uncertainty;

(f) “Key categories ” means a source category of emissions that has a significant influence on a Party’s total emissions in terms of the absolute level of emissions, the trend in emissions over a given time period or the uncertainty in the estimates for that Party. The concept of key categories is an important aspect in inventory development in that it helps to identify priorities for resource allocation in data collection and compilation, quality assurance/quality control and reporting.

5. The definitions of Large Point Sources (LPS) and international air and sea traffic, and notation keys are provided in section II.A of annex I to these Guidelines.

### III. SCOPE

6. The Guidelines guidance for reporting emission data related to the substances specified in section I of annex I to these Guidelines, and define the scope of reporting of emission-related information by Parties.

7. Parties are required to report on the substances and for the years set forth in protocols that they have ratified and that have entered into force.

8. The Guidelines apply only to Parties within the geographical scope of EMEP<sup>2</sup>, as defined in the 1994 Protocol on EMEP, including those Parties whose respective national territories have a part that overlaps with the EMEP emissions reporting grid and another part lying outside the EMEP domain<sup>3</sup>. Parties outside the geographical scope of EMEP are encouraged to take the Guidelines into account when preparing and reporting their annual submissions, and to exchange information similar to that listed in paragraphs 9 and 10 below.

9. Emission reporting required under the Convention and its protocols is set out in subparagraphs (a) to (h) below:

(a) Each Party shall, in accordance with article 8, paragraph (a), of the Convention, 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 per cent (“the 1985 Sulphur Protocol”) shall, in

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<sup>2</sup> The Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe.

<sup>3</sup> For these Parties, reporting requirements in the Guidelines and the annexes thereof referring to spatial coverage explicitly indicate if they refer to: (a) the entire national territory (referred to as “national total”) or (b) that part of the territory overlapping with the EMEP emission reporting grid (referred to as “total within the EMEP emission reporting grid”) or both (a) and (b).

accordance with article 4, provide annually its levels of national annual sulphur emission, and the basis upon which they have been calculated;

(c) Each Party to the 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes (“the NO<sub>x</sub> Protocol”) shall, in accordance with article 8(a), annually report on the levels of national emissions of nitrogen oxides and the basis upon which they have been calculated;

(d) (i) Each Party to the 1991 Geneva Protocol on the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes (“the VOCs Protocol”) shall, in accordance with article 8, annually report on the level of emissions of volatile organic compounds (VOCs) in its territory and in any tropospheric ozone management area in its territory, by total and, to the extent feasible, by sector of origin and by individual VOC for the previous calendar year, and any revision to the reports already made for previous years, and on the basis upon which these levels have been calculated;

(ii) Each Party to the VOCs Protocol shall annually<sup>4</sup> report information on VOCs emissions by sector of origin;

(iii) Each Party to the VOCs Protocol that is within the geographical scope of EMEP shall report information on VOCs emissions with a spatial resolution of 50 km by 50 km<sup>5</sup>, as set out in annex V to these Guidelines;

(e) (i) Each Party to the 1994 Oslo Protocol on Further Reduction of Sulphur Emissions (“the 1994 Sulphur Protocol”) shall, in accordance with article 5, paragraph 1(b), annually report information on the levels of national sulphur emissions, containing emission data for all relevant source categories;

(ii) Each Party to the 1994 Sulphur Protocol that is within the geographical scope of EMEP shall annually report information on the levels of sulphur emissions with spatial resolution as specified by the Steering Body of EMEP and set out in annex V to these Guidelines;

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<sup>4</sup> Reporting interval specified in paragraph 2(b) of Decision 2002/10.

<sup>5</sup> Spatial resolution specified in paragraph 2(c) of Decision 2002/10.

- (f) (i) Each Party to the 1998 Aarhus Protocol on Heavy Metals (“the Heavy Metals Protocol”) shall, as appropriate and in accordance with article 7, collect and report relevant information relating to its emissions of heavy metals other than those listed in annex I to the Protocol, taking into account the guidance on the methodologies and the temporal and spatial resolution given in these Guidelines;
- (ii) Each Party to the Heavy Metals Protocol that is within the geographical scope of EMEP shall annually report, subject to its laws governing the confidentiality of commercial information, information on its levels of emissions of the substances listed in annex I to the Protocol, using as a minimum the methodologies and the temporal and spatial resolution specified by the Steering Body of EMEP and set out in section V of these Guidelines;
- (iii) Each Party to the Heavy Metals Protocol that is outside the geographical scope of EMEP subject to its laws governing commercial information shall make similar information available, if requested to do so by the Executive Body;
- (g) (i) Each Party to the 1998 Aarhus Protocol on Persistent Organic Pollutants (“the POPs Protocol”) shall, in accordance with article 3, paragraph 8, and article 9, annually report information on its level of emissions of the substances listed in annex III to the Protocol;
- (ii) Each Party to the POPs Protocol that is within the geographical scope of EMEP shall annually 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 specified by the Steering Body of EMEP and set out in section V of these Guidelines;
- (iii) Each Party to the POPs Protocol that is outside the geographic scope of EMEP shall, subject to its laws governing the confidentiality of commercial information, make similar information available if requested to do so by the Executive Body;
- (h) (i) Each Party to the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (“the Gothenburg Protocol”) that is within the geographical scope of EMEP shall, in accordance with article 7, paragraph 1 (b) and (c), annually report information on:

- a. Levels of emissions of sulphur, nitrogen oxides, ammonia and VOCs using, as a minimum, the methodologies and the temporal and spatial resolution specified by the Steering Body of EMEP and set out in section V of these Guidelines;
- b. Levels of emissions of each substance in the reference year (1990), using the same methodologies and temporal and spatial resolution;
- c. Data on projected emissions and current reduction plans;
- d. 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;

(ii) Each Party to the Gothenburg Protocol that is outside the geographical scope of EMEP shall, subject to its laws and regulations, make information similar available if requested to do so by the Executive Body.

10. In addition to submitting emission data reports by completing the reporting templates set out in annex IV to these Guidelines, Parties should submit an Informative Inventory Report (IIR), prepared in accordance with the outline set out in annex VI to these Guidelines.

#### **IV. METHODS**

##### **A. Emission estimation methods and principles**

11. Parties shall as a minimum use the methodologies in the latest version of the *EMEP/EEA Air Pollutant Emission Inventory Guidebook – Technical Guidance to Prepare National Emission Inventories following the LRTAP Convention’s Reporting Guidelines and the EU National Emission Ceilings Directive* (the *Guidebook*), as approved by the Executive Body to estimate emissions and projections for each source category. Parties can use national or international methodologies that they consider better able to reflect their national situation, provided that the methodologies produce more accurate estimates than the default methods, are scientifically based, are compatible with the *Guidebook*, and are documented in their IIRs, as described in annex VI to these Guidelines).

12. Parties should make every effort to develop and/or select emission factors, and collect and select activity data in accordance with the *Guidebook*.

13. For sources that are determined to be key categories in accordance with the *Guidebook*, Parties should make every effort to use a higher-tier (detailed) methodology, including country-specific information.

14. Inventories should be calculated and reported without adjustments relating, for example, to climate variations or trade patterns of electricity. If Parties carry out such adjustments to inventory data, these should be reported separately in their IIR, with clear indications of the method followed.

15. For emissions from transport, Parties within the EMEP region should calculate and report emissions consistent with national energy balances reported to Eurostat or the International Energy Agency. Emissions from road vehicle transport should therefore be calculated and reported on the basis of the fuel sold in the Party concerned. Parties outside of the EMEP region may use an alternative emission estimation strategy, provided that they give an explanation of the methodology to the EMEP Centre on Emission Inventories and Projections (CEIP). In addition, Parties may report emissions from road vehicles based on fuel used or kilometres driven in the geographic area of the Party. The method for the estimate(s) should be clearly specified in the IIR.

16. For Parties within the EMEP region for which emission ceilings are derived from national energy projections based on the amount of fuels sold, compliance checking will be based on the reporting on the basis of fuels sold in the geographic area of the Party. Other Parties within the EMEP region<sup>6</sup> may choose to use the national emission total calculated on the basis of fuels used in the geographic area of the Party as a basis for compliance. For Parties outside the EMEP region, which use an alternative methodology as identified to the EMEP Centre on Emission Inventories and Projections, compliance checking will be based on that methodology.

17. International aviation is defined in section II B. of annex I to these Guidelines. Emissions of aviation (national and international) during the LTO cycle belong to the national totals. Cruise emissions from domestic and international aviation should not be included in national totals but reported separately as memo items in table VI.1 of annex IV to these Guidelines.

18. International shipping is defined in section II.B of annex I to these Guidelines. Emissions from fuels used for international maritime shipping should not be included in the national totals, but should be reported separately as a memo item. Emissions from international inland shipping should be included in the national totals for the part that is emitted on national territory. In

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<sup>6</sup> Austria, Belgium, Ireland, Lithuania, Luxemburg, the Netherlands, Switzerland and United Kingdom are in this case.

addition, they should be reported separately as memo items in table IV.1 of annex IV to these Guidelines.

19. Emissions from forest fires should not be included in national totals, but reported separately as memo items in table IV.1 of annex IV to these Guidelines.

20. Projections of emissions should be estimated and aggregated to the relevant source sector set out in table IV.2a of annex IV to these Guidelines. Parties should provide a “with measures” projection for each pollutant in line with the guidance given in the *Guidebook*. Reported projections should be consistent with the inventory. Methodologies and assumptions for projections should be transparent and should allow for an independent review of data. For Parties within the European Union (EU), reported projections should, as far as appropriate, be consistent with those compiled under the EU NEC Directive<sup>7</sup> and the EU Monitoring Mechanism (EUMM)<sup>8</sup>.

21. Emission data reported by Parties within the geographic scope of EMEP should be spatially allocated in the EMEP grid set out in annex V to these Guidelines. Spatially allocated emissions (gridded data) should be calculated using national datasets appropriate to each source category in accordance with the *Guidebook*.

22. Reported LPS data (as set out in table IV.3b of annex IV) should be consistent with emissions reported under the Protocol on Pollutant Release and Transfer Registers (PRTR Protocol) and relevant EU legislation. Differences of more than 10 per cent between LPS data reported elsewhere and those reported under the present Guidelines should be explained in the IIR.

## **B. Key categories and uncertainties**

23. Parties should identify in their IIR national key categories as described in the *Guidebook* for the base year and the latest inventory year.

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<sup>7</sup> Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants, OJ L 309, 27 November 2001, p. 22.

<sup>8</sup> Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol, OJ L 49, 19.02.2004, p. 1.

24. Parties should quantify uncertainties in their emission estimates using the most appropriate methodologies available, taking into account guidance provided in the *Guidebook*. Uncertainties should be described in the IIR.

### **C. Quality assurance/quality control**

25. Procedures for quality assurance and quality control (QA/QC) should be implemented and documented in the IIR. Examples of adequate QA/QC procedures are those set out in the *Guidebook* and those accepted by the Intergovernmental Panel on Climate Change (IPCC) for greenhouse gas inventories.

### **D. Recalculations and time-series consistency**

26. The aim of recalculations is to ensure consistency of the time series and thus improve the accuracy and completeness of the emission inventory. A complete time series, including the base year and all other years for which emissions have been reported and projections, should be calculated using the same methodologies throughout the time series to ensure that the inventory reflects real changes in emissions rather than changes in methodologies. Recalculations should be made if there are changes in methodologies or changes in the manner in which emission factors and activity data are obtained or used, or if estimates are provided for sources which have existed since the base year but which were not previously accounted for in previous submissions. Parties should recalculate emissions when necessary and report their recalculations as part of their annual submissions and document them in the IIR.

27. In cases where activity data or other data cannot be obtained for certain years, including the base year, emissions should be estimated using alternative methodologies or appropriate techniques for estimating activity levels or emissions for these years, taking into account guidance provided in the *Guidebook*. In these instances, Parties should ensure that the time series is consistent and significant fluctuations between years are explained in the IIR.

## **V. REPORTING GUIDANCE**

### **A. General**

28. Annex II to these Guidelines sets out the base year by Party for each protocol. Emission inventory reporting should cover all years from 1980 onwards for those Parties to protocols for which 1980 is the base year, unless an alternative base year has been specified. Emission data should be reported for the latest inventory year (X minus 2), where X is the year in which reporting occurs. For example, for reporting in 2010, emission data for the year 2008 should be

reported. Recalculated data for previous years should also be reported as described in paragraph 27 above.

29. Reporting guidance covers deadlines for submission of data, initiation of the reporting round and preparation of templates and electronic submissions of data, as follows:

(a) Reporting deadlines: The deadline for submitting emission reports is 15 February. The deadline for submitting gridded data and LPS data is 1 March. The deadline for submitting the IIR is 15 March. Parties are, however, encouraged to submit their IIRs at the same time they submit their emission reports. The European Community may deliver the emission report, the gridded data and LPS data for the European Community on 30 April. The European Community may deliver a compilation of the IIRs of the EU Member States on 30 May;

(b) Initiation of emission reporting round and preparation of templates: At the start of each emission reporting round, the UNECE secretariat sends a letter to designated emission experts initiating the reporting round. Reporting templates to be applied by Parties are available on the website of the EMEP Centre on Emission Inventories and Projections (CEIP) (<http://www.ceip.at/>);

(c) Reporting templates: Parties should use the reporting templates in annex IV to these Guidelines or other harmonized reporting options as specified below;

(d) Submission of data by electronic means: Data should be transmitted electronically according to the instructions contained in the letter to designated emission experts referred to in subparagraph (b) above. Electronic submissions may be made to a central repository, provided that the Party informs CEIP that this has been done and that the submission is consistent with these Guidelines.

30. Parties are encouraged to submit recalculations on a sectoral basis and on a gridded basis, if recalculations are made for a year for which gridded data are required. Parties should indicate the justification for any recalculation and describe in the IIR the methods used to ensure time-series consistency, changes in the data and calculation methods, and the inclusion of any new sources not previously accounted for, indicating any relevant changes in the source category.

31. Re-submissions due to errors should be provided within three weeks from the due date for submission and include a clear explanation of the changes made. Re-submissions received later than three weeks from the due date for submission may not be considered for use in EMEP activities.

## **B. Annual reporting**

32. Each Party shall report emissions annually in accordance with the deadlines set forth in paragraph 29 (a) above. Emission reports shall include national emissions and should include activity data for the substances and sectors identified in table IV.1 of annex IV to these Guidelines for the years indicated. Parties should complete the tables at the requested level of aggregation. Where values for individual NFR categories or aggregated NFR categories are not available, the notation keys described in section II.C of annex I to these Guidelines should be used.

33. If a Party considers that a disproportionate amount of effort would be required to collect data for sources or a pollutant for a specific source that would be insignificant in terms of the overall level and trend in national emissions, the Party should list in its IIR all sources excluded on these grounds, together with a justification in terms of the likely level of emissions and an identification of the category as “Not Estimated”, using the notation key “NE” in the reporting tables.

34. Where Parties do not have sufficient detail in their inventory, they may report aggregated emissions. Aggregated emissions may be reported under “other” or under the most significant single sector within the aggregation. Where aggregated emissions are reported, the available notes columns should be annotated to explain which detailed sectors are included and the notation key “IE” should be used for sectors that have emissions reported elsewhere. A rationale for reporting aggregated emissions should be included in the IIR.

35. The IIR should be submitted annually. However, certain elements of the report (as indicated in annex VI to these Guidelines) need only be updated every five years.

## **C. Five-yearly reporting**

36. Parties to the Gothenburg Protocol shall report their latest available projections at least every five years, and provide any updated projections annually by 15 February, for the years 2010, 2015, 2020, 2030 and 2050<sup>9</sup>. Parties to the Convention that are not Parties to the Protocol are also strongly encouraged to provide this information.

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<sup>9</sup> Parties are not required to report projections for those years in which emissions data are reported as part of the inventory reporting specified in paragraph 29.

37. Projected emissions for sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>), particulate matter-10 (PM<sub>10</sub>), PM<sub>2.5</sub> and non-methane volatile organic compounds (NMVOCs) should be reported using table IV.2a of annex IV to these Guidelines. Parties should complete the tables at the requested level of aggregation. Where values for individual categories or aggregated NFR categories are not available, the notation keys defined in section II.C of annex I to these Guidelines should be used.

38. Quantitative information on parameters underlying emission projections should be reported using the templates set out in table IV.2b of annex IV to these Guidelines. These parameters should be reported for the projection target year and the historic year chosen as the starting year for the projections.

39. For every fifth year from 2005, or where changes in country boundaries occur should report aggregated sectoral (Gridding NFR (GNFR)) gridded emissions and LPS emissions, as defined in section II.A of annex I to these Guidelines. The aggregated sectors (GNFR) for reporting are defined in table III B of annex IV to these Guidelines. Reported substances should include sulphur oxides, nitrogen oxides, ammonia, NMVOCs, carbon monoxide (CO), PM<sub>2.5</sub>, PM<sub>10</sub>, lead, cadmium, mercury, polycyclic aromatic hydrocarbons (PAHs), hexachlorobenzene (HCB) and dioxins and furans (PCDD/F). Parties are encouraged to update their gridded and LPS data and report more frequently where changes in spatial patterns have occurred, so that the models can represent the most up-to-date information.

40. Gridded emissions for each GNFR aggregated sector (as defined in table III B of annex III to these Guidelines) should be provided for the EMEP grid squares, as defined in annex V to these Guidelines, that overlie the Party's territory.

41. For each LPS, the coordinates (latitude and longitude), stack height class, emissions of the specified substances and, where applicable, the appropriate European Pollutant Release Transfer Register (E-PRTR) and PRTR facility ID codes as used for the corresponding data set year, should be reported using the templates provided in table IV.3b of annex IV to these Guidelines. For the purposes of reporting under the Convention and its protocols, Parties can aggregate the emissions from individual locations/processes within the facility as long as they are consistent with the GNFR sector aggregations (see table 3 of annex III to these Guidelines) and separate emissions according to the appropriate stack height classes identified in table 3b of annex IV to these Guidelines.

42. Parties may report LPS data through the provision of electronic copies of Point Sources Reports provided under any other international or EU legislation with regard to the following:

- (a) Emission estimates must be consistent with the annual inventory submitted under the Convention, in accordance with these Guidelines;
- (b) The LPS has a unique spatial identification;
- (c) A clear explanation of the process and source sector must be given, including their relationship to the aggregated GNFR sector presented in annex III, table B, to avoid double counting;
- (d) For those point sources meeting the definition of an LPS, submitted information should include for each facility those parameters listed in paragraph 42, including accompanying stack height class data for each facility (which is excluded from for example E-PRTR reporting) must be provided;

#### **D. Review of information and additional reporting**

43. For every fifth year (2010, 2015, 2020, etc.), Parties are encouraged to inspect and comment on the representativeness of the Party-specific data used for modelling at the Meteorological Synthesizing Centres (MSC-West and MSC-East). This includes:

- (a) Land-use data;
- (b) Diurnal and seasonal (weekly and monthly) temporal patterns of emissions by aggregated sectors (as defined in table III.B of annex III to these Guidelines);
- (c) Chemical speciation of primary PM emissions, in particular in terms of the share of organic versus elemental carbon;
- (d) 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;
- (e) Information on the relative contribution (%) of toxic congeners of PCDD/F (dioxins and furans) 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;
- (f) Information on natural emissions.

44. All these data necessary for chemical transport modelling will be made available via the EMEP website for transparency and review by each Party.

## **VI. RECORD-KEEPING**

45. Parties should archive all relevant emission information for each year, including, if practicable, 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 and projections, inter alia, for the purpose of inventory review, its evaluation for use by the Implementation Committee, and transparency for users. Inventory information, including the corresponding data on any recalculations, should be archived for all years from the base year. Parties are encouraged to collect and archive the information in a single location, or at least to keep the number of facilities at a minimum.

## **VII. LANGUAGES**

46. The IIR should be submitted in one of the working languages of the United Nations Economic Commission for Europe, in accordance with its rules of procedure (i.e. French, English or Russian). Where possible, Parties submitting IIRs in French and Russian are encouraged to also provide an English translation.

## **VIII. UPDATING OF GUIDELINES**

47. The Guidelines are subject to review and revision as decided by the Executive Body. The Task Force on Emission Inventories and Projections may, if necessary, propose amendments to the Steering Body to EMEP to achieve harmonization with other reporting obligations, as well as to meet needs for increased transparency or other needs for further revision. The Task Force should transmit to the Steering Body any problems or discrepancies encountered by emissions experts in the application of the Guidelines.

Annex I

**SUBSTANCES AND DEFINITIONS**

**I. SUBSTANCES<sup>10</sup>**

**A. Category 1 – Substances for which there are existing emission reporting obligations**

1. Sulphur oxides (SO<sub>x</sub>) means all sulphur compounds, expressed as sulphur dioxide (SO<sub>2</sub>). The major part of anthropogenic emissions of sulphur oxides to the atmosphere is in the form of SO<sub>2</sub> and, therefore, emissions of SO<sub>2</sub> and sulphur trioxide (SO<sub>3</sub>) should be reported as SO<sub>2</sub> in mass units. Emissions of other sulphur compounds such as sulphate, sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) and non-oxygenated compounds of sulphur, e.g. hydrogen sulphide (H<sub>2</sub>S), 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 all sulphur compounds as SO<sub>2</sub> in mass units.

2. Nitrogen oxides (NO<sub>x</sub>) means nitric oxide and nitrogen dioxide, expressed as nitrogen dioxide (NO<sub>2</sub>).

3. Ammonia (NH<sub>3</sub>).

4. Non-methane volatile organic compounds (NMVOCs) means any organic compound, excluding methane, having a vapour pressure of 0.01 kPa or more at 293.15 K, 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 an NMVOCs.

5. Heavy metals (i.e. cadmium, lead, mercury) and their compounds.

6. Persistent organic pollutants: (polycyclic aromatic hydrocarbons (PAHs), dioxins and furans (PCDD/F) and hexachlorobenzene (HCB).

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<sup>10</sup> Any departure from the below definitions should be clarified in the IIR.

**B. Category 2 – Substances for which parties are encouraged to report emission data**

7. Carbon monoxide.
8. Particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub> and TSP (total suspended particulate matter)).
  - (a) PM<sub>2.5</sub>: The mass of particulate matter that is measured after passing through a size-selective inlet with a 50 per cent efficiency cut-off at 2.5 µm aerodynamic diameter;
  - (b) PM<sub>10</sub>: The mass of particulate matter that is measured after passing through a size-selective inlet with a 50 per cent efficiency cut-off at 10 µm aerodynamic diameter;
  - (c) (TSP the mass of particles, of any shape, structure or density, dispersed in the gas phase at the sampling point conditions which may be collected by filtration under specified conditions after representative sampling of the gas to be analyzed, and which remain upstream of the filter and on the filter after drying under specified conditions.
9. Heavy metals (arsenic, chromium, copper, nickel, selenium, zinc) and their compounds.
10. Persistent organic pollutants (lindane, dichloro-diphenyl-trichloroethane (DDT), polychlorinated biphenyl (PCBs), pentabromodiphenyl ether (PeBDE), perfluorooctane sulfonate (PFOS), hexachlorobutadiene (HCBd), octabromodiphenyl ether (OctaBDE), polychlorinated naphthalenes (PCNs), pentachlorobenzene (PeCB) and short-chained chlorinated paraffins (SCCP).

**II. DEFINITIONS**

**A. Large Point Sources**

11. Large Point Sources (LPS) are defined as facilities<sup>11</sup> whose combined emissions, within the limited identifiable area of the site premises, exceed the pollutant emission thresholds

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<sup>11</sup> As defined in Article 2 (4) and (5) of the E-PRTR Regulation, “(4) ‘Facility’ means one or more installations on the same site that are operated by the same natural or legal person; (5) ‘Site’ means the geographical location of the facility;” EC Regulation 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC, OJ L33 of 4.2.2006, p. 1.

identified below which have been extracted from the full list of pollutants in E-PRTR Regulation<sup>12</sup> (annex II)<sup>13</sup> and listed in table 1 below.

**Table 1: List of pollutants to be reported for a LPS if the applicable threshold value is exceeded based on thresholds specified in E-PRTR Regulation (annex II).**

Pollutants/Substances	Thresholds in kg/year
SO <sub>2</sub>	150,000
NO <sub>x</sub>	100,000
CO	500,000
NMVOCS	100,000
NH <sub>3</sub>	10,000
PM <sub>2.5</sub>	50,000
PM <sub>10</sub>	50,000
Pb	200
Cd	10
Hg	10
PAHs	50
PCDD/F	0.0001
HCB	10

Parties that do not report combustion process emissions under any other international or EU wide protocols or decisions may limit their criteria for Combustion Process LPS selection to > 300mw thermal capacity.

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<sup>12</sup> EC Regulation 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC, OJ L33 of 4.2.2006, p. 1.

<sup>13</sup> As PM<sub>2.5</sub> is not specified in the E-PRTR regulation, this has been added to the table 1B of these Guidelines with the same threshold as for PM<sub>10</sub>.

**Table 2: The stack height classes (physical height of stack) in the reporting templates**

1. Height class 1 < 45 metres;
2. 45 metres ≤ Height class 2 < 100 metres;
3. 100 metres ≤ Height class 3 < 150 metres;
4. 150 metres ≤ Height class 4 < 200 metres;
5. Height class 5 < 200 metres.

**B. International air and sea traffic<sup>14</sup>**

12. International Shipping: Emissions from fuels used by vessels of all flags that are engaged in international water-borne navigation. The international navigation may take place at sea, on inland lakes and waterways and in coastal waters. The definition includes emissions from journeys that depart in one country and arrive in a different country and excludes consumption by fishing vessels.

13. International Aviation: Emissions from flights that depart in one country and arrive in a different country. Include take-offs and landings for these flight stages. Emissions from international military aviation can be included provided that the same definitional distinction is applied.

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<sup>14</sup> The below definitions apply to the present Guidelines and are taken from chapters 3.5.1 and 3.6.1 of volume 2 of the IPCC 2006 Guidelines.

### C. Notation keys to be used when preparing submissions

**Table 3: Notation Keys**

Definition	UNECE/EMEP explanation
Not estimated (NE)	Emissions occur, but have not been estimated or reported.
Included elsewhere (IE)	Emissions for this source are estimated and included in the inventory but not presented separately for this source. The source where these emissions are included should be indicated.
Confidential information (C)	Emissions are aggregated and included elsewhere in the inventory because reporting at a disaggregated level could lead to the disclosure of confidential information.
Not applicable (NA)	The source exists but relevant emissions are considered never to occur.
Not occurring (NO)	An source or process does not exist within a country.
Not relevant (NR)	According to paragraph 9 in the Emission Reporting Guidelines, emission inventory reporting should cover all years from 1980 onwards if data are available. However, "NR" (not relevant) is introduced to ease the reporting where emissions are not strictly required by the different protocols, e.g. for some Parties emissions of NMVOCs prior to 1988.

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