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Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)

Thirty-first session
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Item 4(g) of the provisional agenda

EMISSIONS

GUIDELINES FOR ESTIMATING AND REPORTING EMISSIONS

Report by the Task Force on Emission Inventories and Projections

INTRODUCTION

1. These Guidelines for Estimating and Reporting Emission Data (the Guidelines) were drafted by the Task Force on Emission Inventories and Projections to update the 2002 Guidelines. They are presented for consideration by the thirty-first session of the Steering Body to EMEP. Their preparation was in accordance with the 2007 workplan, item 2.1 (f) (ECE/EB.AIR/2007/ 10), adopted by the Executive Body at its twenty-fourth session (ECE/EB.AIR/89, para. 72). Annexes to the guidelines, except for the definitions of pollutants, which is included here, will be provided as informal documents to the Steering Body.

2. The objectives of developing the Guidelines were to assist Parties in meeting their emission reporting obligations under the Convention and its protocols; to support the evaluation of emission reduction strategies; to facilitate the technical review of air pollutant emission inventories in accordance with the methods and procedures adopted by the Executive Body at its twenty-third session (EB.AIR/GE.1/2005/7, Annex III); and to allow for the effective assessment of compliance with emission obligations under protocols by the Convention's Implementation Committee.

3. The Guidelines aim to achieve greater transparency, consistency, comparability, completeness and accuracy in reported emission data. Moreover, they aim to harmonize reporting procedures under the Convention, as well as improve the consistency of reported emissions with those reported under other multilateral environmental agreements, such as the United Nations Framework Convention on Climate Change, the Stockholm Convention on Persistent Organic Pollutants (POPs), the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and its Kiev Protocol on Pollutant Release and Transfer Registers (PRTR)[1], the European Union National Emission Ceilings (NEC)[2] Directive, the Large Combustion Plant Directive[3], POPs Regulation[4], European Pollutant Release and Transfer Register (E-PRTR)[5] and the European Community Greenhouse Gas Monitoring Mechanism[6].

4. The legal standing of the Guidelines is based on Executive Body decisions 2002/10 and 2005/1, and on emission data reporting under the Convention and the protocols in force, adopted

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[1] http://www.unece.org/env/pp/prtr.htm
[2] Recommendations on developing and reporting national programmes under the European Union National Emission Ceilings (NEC) Directive, available at: http://europe.eu.int/comm/environment/air/pdf/recom_nec.pdf
[3] Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants, OJ L 309 of 27.11.2001, p.1.
[4] European Commission regulation 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC, OJ L 158, 30.4.2004, p. 7.
[5] 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.
[6] Decision 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 of 19.02.2004, p. 1, and Commission Decision 2005/166/EC: of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol Annex III, OJ L 55/57 of 1.3.2005.

at its twentieth session and twenty-third session, respectively. However, the Executive Body may adopt subsequent decisions to strengthen further or otherwise clarify the legal basis of the Guidelines. The Guidelines apply to Parties within the geographic scope of EMEP, including those Parties whose respective national territories have a part that overlaps with the EMEP grid and another part lying outside the EMEP domain[7]. Parties outside the geographic scope of EMEP are encouraged to follow them when preparing and reporting their annual submissions.

5. 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 continue to assess their usefulness and transmit to the Steering Body any problems or discrepancies encountered by emissions experts in reporting data.

I. OBJECTIVES

6. The objectives of the Guidelines under the Convention 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 1984 Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP);

(iii) The 1985 Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent, article 4;

(iv) The 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes, article 8;

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[7] 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 grid (referred to as “total within EMEP grid”), or to both (a) and (b).

(v) The 1991 Geneva Protocol on the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes, article 8;

(vi) The 1994 Oslo Protocol on Further Reduction of Sulphur Emissions, article 5;

(vii) The 1998 Aarhus Protocol on Heavy Metals, article 3, paragraph 5, and article 7;

(viii) The 1998 Aarhus Protocol on Persistent Organic Pollutants, article 3, paragraph 8 and article 9;

(ix) The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, article 7, paragraph 1;

(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 adopted by the Executive Body at its twenty-third session (EB.AIR7GE.1/2005/7, annex III);

(d) To allow for the effective assessment of compliance with emission obligations under Protocols by the Convention's Implementation Committee;

(e) To allow harmonizing emission reporting with reporting under other Conventions and the European Union NEC[8] Directive, the Large Combustion Plant Directive[9], POPs Regulation[10], E-PRTR[11] and the European Community Greenhouse Gas Monitoring Mechanism.

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[8] Recommendations on developing and reporting national programmes under the European Union National Emission Ceilings (NEC) Directive, available at: http://europe.eu.int/comm/environment/air/pdf/recom_nec.pdf

[9] Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants, OJ L 309 of 27.11.2001, p.1.

[10] European Commission regulation 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC, OJ L 158, 30.4.2004, p. 7.

[11] 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.

II. PRINCIPLES AND CONCEPTS

7. The term “Parties” in the Guidelines refers to Parties to the Convention, unless otherwise specified. The term may also refer specifically to Parties to one or more of the protocols to the Convention that are in force. 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.

8. The Guidelines aim to ensure that national emission inventories and projected emissions conform to the principles of transparency, consistency, comparability, completeness and accuracy, as defined in paragraph 8 below.

(a) In the context of the present Guidelines:

(b) “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 to understand how the inventory was compiled and assure it meets good practice requirements. The transparency of emission reporting is fundamental to the effective use, review and continuous improvement of the inventory.

(c) “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 emissions. 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.

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

(e) “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 annex I should be used when filling in the reporting template and their absence should be documented.

(f) "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.

(g) "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.

III. SCOPE

A. General

9. The Guidelines offer guidance for estimating and reporting emissions of the substances defined in annex I and define the scope of reporting of emission-related information by Parties. The Guidelines are intended to facilitate Parties' designated emission experts and other inventory compilers in constructing and submitting inventories in accordance with the provisions set forth in the Convention and its protocols. Parties are required to report only on the substances and for the years set forth in protocols that they have ratified and that have entered into force. Reporting requirements for a given Party under a particular Protocol apply ninety days from the date of ratification for the Party in question. The Executive Body or the Steering Body to EMEP may 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. Mandatory emission reporting under the Convention and its protocols is set out in sub-paragraphs (a) to (h) below:
[Note: The legal status and possible strengthening of the Guidelines will be considered by the Working Group on Strategies and Review at its fortieth session in September 2007.]

(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 shall, in 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 shall, in accordance with article 8(a), annually provide the levels of national emissions of nitrogen oxides and the basis upon which they have 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, annually report on the level of emissions of volatile organic compounds (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 to guidelines to be specified by the Executive Body for 1988 or any other year taken as the base year for article 2.2, and on the basis upon which these levels have been calculated. In addition, Parties within the geographical scope of EMEP shall report, at intervals to be specified by the Executive Body, information on VOC emissions by sector of origin with a spatial resolution to be specified by the Executive Body, appropriate for purposes of modelling the formation and transport of secondary photochemical oxidant products;

(e) Each Party to the 1994 Oslo Protocol on Further Reduction of Sulphur Emissions shall, in accordance with article 5, annually report information on the levels of national sulphur emissions, containing emission data for all relevant source categories. In addition, each Party within the geographical scope of EMEP shall annually report information on the levels of sulphur emissions with temporal and spatial resolution as specified by the Steering Body of EMEP;

(f) Each Party to the 1998 Aarhus Protocol on Heavy Metals 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 specified in accordance with the Protocol, and, if it is a Party outside the geographical scope of EMEP, using as guidance the methodologies listed in the guidelines. Each Party 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 cadmium, lead and mercury, using as a minimum the methodologies and the temporal and spatial resolution specified in accordance with the Protocol. 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 (HCB))[12] and any POPs added to the Protocol in future. Parties are encouraged to provide emission data on substances in annexes I and II, if available, as well as on substances that are subsequently added to the Protocol (see paragraphs 8 and 9 below and annex I, Definitions). Each Party 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 in accordance with the Protocol. 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), annually 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 specified in accordance with the Protocol;

(j) Levels of emissions of each substance in the reference year (1990) using the same methodologies and temporal and spatial resolution;

(k) Data on projected emissions and current reduction plans;

(l) 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.

[(i) Provisions for reporting emissions of particulate matter may be added at a later stage, depending on the decision of the Parties to the Gothenburg Protocol in the review of the Protocol.]

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[12] See paragraph 11 for comprehensive list of POPs that Parties are encouraged to report.

10. The Guidelines apply to Parties within the geographic scope of EMEP. Parties outside the scope of EMEP are encouraged to follow the Guidelines when preparing and reporting their annual submissions and to make available information similar to that listed in paragraphs 6(a)-(i) above.

11. In addition to submitting emission data reports by filling out the reporting templates in annex IV, Parties within the geographical scope of EMEP [should][shall] submit an Informative Inventory Report (IIR) prepared according to the outline provided in annex VI. Parties outside the geographical scope of EMEP are encouraged to also submit an IIR or similar reports.

B. Substances

12. The air pollutants covered by these Guidelines are: sulphur oxides (SO_2), nitrogen oxides (NOx), ammonia (NH_3), non-methane volatile organic compounds (NMVOCs), carbon monoxide, particulate matter (PM_{10} and $PM_{2.5}$ and, as additional information, TSP), heavy metals (cadmium, lead, mercury, and as additional information: arsenic, chromium, copper, nickel, selenium, zinc) and persistent organic pollutants (lindane, DDT, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxins and furans (PCDD/F), hexachlorobenzene (HCB), and any additional POPs that may be added to the Protocol in future).

13. Parties are encouraged to report emissions on substances in annexes I and II of the 1998 Protocol on POPs, if available, as well as on: pentabromodiphenyl ether (PeBDE), perfluorooctane sulfonate (PFOS), hexachlorobutadeine (HCBD), octabromodiphenyl ether (OctaBDE), polychlorinated naphthalenes (PCN), pentachlorobenzene (PeCB), and short-chained chlorinated paraffins (SCCP)).

14. Parties within the geographic scope of EMEP should identify large point sources (as defined in annex I, para. 4, table 1A) to facilitate the accurate spatial allocation 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.

A. Reporting years

1. Reporting of historical data

15. According to the protocols, each Party shall, for each protocol to which it is party, report emissions for:

(a) The base year of the Protocol; and

(b) 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 (emission reporting obligations, by party and by protocol) sets out the base year 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. Otherwise, emissions shall be reported from 1990 onwards.

2. Reporting of projected data

16. Parties to the 1999 Gothenburg Protocol, within the geographic scope of EMEP [should] [shall] report projected activity data and projected national total emissions for SO_2, NO_x, NH_3, NMVOC for the years 2010, 2015 ad 2020. Parties are moreover encouraged to report projected emissions of PM_{10} and $PM_{2.5}$ for these years. [Note: Projection years beyond 2020 will be indicated at a later stage.]

IV. METHODS

A. Emission estimation methods and principles

17. Parties within the geographic scope of EMEP [should][shall] use the methodologies in the latest version of the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook (the Guidebook), as endorsed 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, are scientifically based, are compatible with the Guidebook, and are documented in their Informative Inventory Report (IIR, as described in paragraph 8 and annex VI).

18. For sources that are determined to be key categories in accordance with the Guidebook, Parties within the geographical scope of EMEP should make every effort to use a higher tier (detailed) methodology, including country-specific information. Parties should also make every effort to develop and/or select emission factors, and collect and select activity data in accordance with the Guidebook.

19. Parties outside the geographic scope of EMEP should use methodologies that are appropriate for the particular circumstances of their national situation and these methodologies should be documented in their IIR or equivalent documentation.

20. Inventories [should][shall] be calculated and reported without adjustments relating, for example, to climate variations or trade patterns of electricity. If Parties, in addition, carry out such adjustments to inventory data, these should be reported separately in a transparent manner, with clear indications of the method followed.

21. For emissions from transport, Parties should calculate and report estimates based on national fuel consumption. For Parties within the geographic scope of EMEP, this information should be consistent with national energy balances reported to Eurostat and the International Energy Agency. For example, emissions from road vehicle transport should be attributed to the country where the fuel is sold to the end user. Alternatively, a Party may report emissions from road vehicle transport calculated on the basis of national vehicle kilometres. If cross-border movement of fuel in or out of the geographic area of a Party accounts for a significant proportion of its emissions in a particular source category, as calculated on this basis, the Party should provide separate estimates to quantify the effect of such fuel transfer on the emissions from the source category concerned and on its total national emissions. The basis for the separate estimates should be clearly specified in the IIR. Any approach chosen should be used consistently across all years and pollutants. [Note: This paragraph is subject to policy discussions.]

22. Emissions from fuels used on ships or aircraft engaged in international transport (as defined in annex I) and emissions from forest fires should not be included in national totals, but reported separately as memo items in table IV 1 (annex IV). [Note: This paragraph is subject to policy discussions.]

23. Projections of emissions [should][shall] be estimated and aggregated to the relevant source sector set out in table IV.2a. 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. Where appropriate, Parties should follow the guidance on projections in the Guidebook. Parties [should][shall] provide a “with measures” (current legislation) projection for each pollutant taking into account adopted and implemented policies and measures. Activity data for emission projections should be consistent with national assumptions relating to population, economic growth, traffic, agriculture and other drivers. For Parties within the European Union (EU), reported projections should be equal, as far as possible,

to those compiled under the EU NEC[13] Directive and consistent with the EU Monitoring Mechanism (EUMM)[14].

24. Emission data reported by Parties within the geographic scope of EMEP should be spatially allocated in the EMEP grid defined in annex V. Spatially allocated emissions, gridded data, should be calculated using national datasets appropriate to each source category following the Guidebook.

25. Reported large point source (LPS) data (table IV 3b) should be consistent with emissions reported to other international bodies, such as the reporting under the PRTR Protocol and the EU E-PRTR Regulation. Where large differences, more than about 10 per cent, occur between company-reported or other published data and those reported under the present Guidelines, these should be explained in the IIR.

B. Key categories and uncertainties

26. Parties within the geographical scope of EMEP [should][shall] identify in their IIR national key categories for the base year and the latest inventory year as described in the Guidebook.

27. 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 or in equivalent documentation for Parties outside of the geographic scope of EMEP.

C. Quality Assurance/Quality Control

28. Procedures for quality assurance and quality control (QA/QC) [should][shall] be implemented and documented in the IIR or in equivalent documentation for Parties outside of the geographic scope of EMEP. Examples of adequate QA/QC procedures would be those in the

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[13] Details of the NEC reporting requirements are outlined in “Recommendations on developing and reporting national programmes under the National Emission Ceilings Directive", available at: http://europe.eu.int/comm/environment/air/pdf/recom_nec.pdf

[14] The European Union National Emission Ceilings (NEC) directive requires reporting of scenarios with additional measures and ‘with additional measures’ projections, taking into account planned policies and measures;the 1999 Gothenburg Protocol includes provisions for exchange of information on national policies, plans and measures which Parties make available through a bi-annual questionnaire on strategies and policies for air pollution abatement.

Guidebook and those accepted by the Intergovernmental Panel on Climate Change (IPCC) for greenhouse gas inventories.

D. Recalculations and time-series consistency

29. The aim of recalculations is to ensure consistency of the time series and thus the improvement of 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 or in equivalent documentation for Parties outside of the geographic scope of EMEP.

30. In cases where activity data or other data is not obtainable for certain years, including the base year, emissions for these years may need to be estimated with alternative methodologies or by using appropriate techniques for estimating activity levels or emissions over missing years (for example, extrapolations, interpolations, use of surrogate data or a combination of methods), 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 or in equivalent documentation for Parties outside of the geographic scope of EMEP.

V. REPORTING GUIDANCE

A. General

31. 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 to the secretariat is 15 February. The deadline for submitting gridded data and LPS data is 1 March. The deadline for submitting the IIR is 15 March. However, Parties are encouraged to submit their IIR at the same time they submit their emission reports.

(b) Initiation of emission reporting round and preparation of templates: At the start of each emission reporting round, the secretariat sends a letter to designated emission experts

initiating the reporting round and updated templates are made available on the EMEP website (www.emep.int). Parties [should][shall] use the reporting templates in annex IV or other harmonized reporting options as specified below. Reporting templates aim to facilitate the process of submitting data electronically, as well as to standardize and simplify the processing of data and its analysis[15].

(c) Submission of data by electronic means: Data should be transmitted to the secretariat by e-mail. In the event that e-mail is not possible, the submission should be transmitted on diskette or by CD-ROM. Electronic submissions may be made to a central repository, provided the Party informs the secretariat of the submission by deadline and the format is consistent with the EMEP templates and does not create undue burden for the secretariat.

32. 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. Parties outside the geographic scope of EMEP are encouraged to provide similar information.

33. Re-submissions by experts due to errors should be received by the secretariat within three weeks from the due date for submission and include a clear explanation of the changes made. Late re-submissions (i.e. later than three weeks from the due date for submission) will not be included in the annual inventory review, EMEP modelling exercises, or loaded to WEBDAB.

B. Annual reporting

34. Each Party to the Convention shall report emissions annually in accordance with the deadlines set forth in paragraph 31(a) above. For Parties within the geographic scope of EMEP, emission reports shall include national emissions and activity data for the substances and sectors identified in annex IV, table IV.1 for the years indicated. Parties should fill in the tables at the requested level of aggregation. Where values for individual NFR categories or aggregated NFR categories are not available, notation keys listed in annex I should be used. Parties outside the

[15] Parties outside the geographical scope of EMEP are not required to report all information in templates.

scope of EMEP are encouraged to follow the Guidelines when reporting their national annual emissions.

35. A Party may consider 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. In these circumstances the Party should list 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.

36. 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" (refer to annex I) should be used for sectors that have emissions reported elsewhere. A rationale for reporting aggregated emissions should be included in the IIR.

37. The IIR [shall][shall] be submitted annually. However, certain elements of the report (as indicated in annex VI) need only be updated every five years.

C. Five-yearly reporting

38. Parties within the geographic scope of EMEP [should][shall] report their latest available projections at least every five years, beginning with the 2008 reporting round, and provide updated projections, if any, annually, by 15 February, for the years 2010, 2015 and 2020. Note: Future projection years may be decided at a later date. Projected emissions for SO_2, NOx, NH_3, PM_{10}, $PM_{2.5}$ and NMVOC are reported in table IV.2a.

(a) Quantitative information on parameters underlying emission projections is specified in Table IV.2b. These parameters should be reported for the projection target year and the historic year chosen as the starting year for the projections.

(b) Parties who are Member States of the EU may report projections through the provision of copies of projections submitted under the EU NEC Directive, provided the data are consistent with their reported historic emission data and that they cover the years and pollutants specified above.

39. For every fifth year from 2005, or where changes in country boundaries occur, each Party within the geographic scope of EMEP should report aggregated sectoral (Gridding NFR

(GNFR)) gridded emissions and LPS emissions by the 1st March of the reporting year. The aggregated sectors (GNFR) for reporting are defined in annex IV, table III B. The thresholds for defining LPS are included in annex I. Reported substances should include sulphur oxides, nitrogen oxides, ammonia, NMVOCs, carbon monoxide, $PM_{2.5}$, PM_{10}, lead, cadmium, mercury, PAHs, HCB and 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.

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

(b) For each LPS, the coordinates (latitude and longitude), stack height class, emissions of the specified substances and, where applicable, the appropriate E-PRTR and PRTR facility ID codes as used for the corresponding data set year, should be provided as indicated in annex IV, table IV.3b. 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 annex III, table 3) and separate emissions according to the appropriate stack height classes identified in annex IV, table 3b.

(c) Parties may report LPS data through the provision of electronic copies of Point Sources Reports provided under E-PRTR and the PRTR Protocol to the Aarhus Convention, with the following provisions:

(i) Emission estimates must be consistent with the annual inventory submitted under the Convention;

(ii) The LPS has a unique spatial identification;

(iii) 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;

(iv) The submission must include, for point sources that meet the criteria defined in annex I (Definitions), section 3, at least the point sources and parameters required under annex I and annex IV.3b;

(v) Accompanying stack height data for each facility (which is excluded from for example E-PRTR reporting) must be provided;

(vi) 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.

D. Review of information and additional reporting

40. For every fifth year (2005, 2010, 2015, 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) 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.

41. All these data necessary for chemical transport modelling will be made available via the Internet on the EMEP home page (see annex VI - References) for transparency and review by each Party.

VI. RECORD KEEPING

42. Officially submitted data reported under the Convention will be stored in the UNECE/EMEP emission database (available through the EMEP homepage, http://www.emep.int/). This database is accessible via the Internet and will contain relevant links to national websites. The original submission and the IIRs will also be made available on the Internet.

43. 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, 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

44. The IIR is to 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). When possible, Parties submitting IIRs in French and Russian are encouraged to submit an English translation.

VIII. UPDATING OF GUIDELINES

45. 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 updates of the Guidelines to the EMEP Steering Body to achieve harmonization with other reporting obligations, to increase transparency or if it finds other reasons that the Guidelines need revision.

Annex 1

DEFINITIONS

1. The following definitions of air pollutants apply:

(a) Sulphur oxides means all sulphur compounds, expressed as sulphur dioxide (SO_2);

(b) Note: The major part of anthropogenic emissions of sulphur oxides to the atmosphere is in the form of SO_2 and, therefore, emissions of SO_2 and SO_3 should be reported as SO_2 in mass units. Emissions of other S compounds such as sulphate, H_2SO_4 and non-oxygenated compounds of sulphur, e.g. H_2S, 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_2 in mass units.

(c) Nitrogen oxides means nitric oxide and nitrogen dioxide, expressed as nitrogen dioxide (NO_2);

(d) Ammonia means NH_3;

(e) Non-methane volatile organic compounds (NMVOC) 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 a NMVOC;

(f) Carbon monoxide means CO;

(g) Particulate Matter: $PM_{2.5}$: The mass of particulate matter that is measured after passing through a size-selective inlet with a 50 % efficiency cut-off at 2.5 µm aerodynamic diameter. PM_{10}: The mass of particulate matter that is measured after passing through a size-selective inlet with a 50 % efficiency cut-off at 10 µm aerodynamic diameter. TSP (total suspended particulate matter): 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.

(h) Heavy metals means those metals or, in some cases, metalloids which are stable and have a density greater than 4.5 g/cm^3 and their compounds. Minimum reporting covers cadmium, lead and mercury. Additional reporting covers arsenic, chromium, copper, nickel, selenium and zinc;

2. 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. Pollutants covered by the Guidelines include: lindane, DDT, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxins and furans (PCDD/F), hexachlorobenzene (HCB) and any additional POPs that may be added to the Protocol on POPs in the future. Additionally, Parties are encouraged to report emissions on substances in annexes I and II, if available, as well as on: pentabromodiphenyl ether (PeBDE), perfluorooctane sulfonate (PFOS), hexachlorobutadeine (HCBD), octabromodiphenyl ether (OctaBDE), polychlorinated naphthalenes (PCN), pentachlorobenzene (PeCB) and short-chained chlorinated paraffins (SCCP).

Note 1: It is recommended that the emissions of different congeners of PCDD/F are given in International Toxicity Equivalents (I-TEQ) in comparison to 2,3,7,8,-TCDD using the system by NATO.

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

Any departure from these definitions should be clarified in the IIR.