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Item 5 of the provisional agenda

Options for revising the Protocol on Heavy Metals

Options for revising the Protocol on Heavy Metals

Note by the secretariat

Introduction

1. At its forty-eighth session in April 2011, the Working Group on Strategies and Review exchanged views on the options for revising the 1998 Protocol on Heavy Metals to the Convention on Long-range Transboundary Air Pollution presented in document ECE/EB.AIR/WG.5/2011/4, and decided to continue related work on the Protocol at its forty-ninth session. The annex to this document contains the updated amendment proposals, taking into account comments made at the Working Group's forty-eighth session in April 2011, including the amendment proposals to the Protocol's annex V, made in 2010 (ECE/EB.AIR/WG.5/2010/10, para. 16).
2. Also at its forty-eighth session, the Working Group accepted the need to update annex V on emission limit values from major stationary sources in a manner consistent with the proposed amendments to the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol), but without introducing further obstacles to ratification.
3. The Working Group agreed that the Protocol on Heavy Metals should be made more adaptable to future developments through the production of a guidance document on best available techniques extracted from annex III to the Protocol. An updated draft guidance document will be presented by the Chair of the Task Force on Heavy Metals at the forty-ninth session.
4. In line with the decision by the Convention's Executive Body at its twenty-eighth session in December 2010 to extend the negotiation mandate of the Working Group, the document also includes proposals for amendments to annexes VI and VII, and

consequential changes to the Protocol text regarding mercury-containing products. These amendment proposals reflect the relevant amendment proposals presented in document ECE/EB.AIR/WG.5/2010/6 (paras. 17–20). When considering the above amendment proposals, the Working Group is invited to be mindful of the work undertaken by the Intergovernmental Negotiating Committee under the auspices of the United Nations Environment Programme towards a legally binding global instrument to address mercury, which also addresses mercury-containing products.

5. In line with its revised mandate, the Working Group is invited to continue negotiations for revising the Protocol on Heavy Metals and its annexes with a view to finalizing the discussions and presenting proposed amendments at the thirtieth session of the Executive Body in 2012 at the latest.

6. In 2011, the negotiations should focus on those proposed amendments that address issues raised also in the revision of the Gothenburg Protocol, such as the proposed emission limit values for dust.

7. The Working Group is expected to report on its progress to the Executive Body for the Convention at its twenty- ninth session in 2011.

Annex**Options for revising the 1998 Protocol on Heavy Metals****I. Amendment proposals to the text of the Protocol****A. Article 1: Definitions**

1. Paragraph 10 of article 1 of the Protocol shall be replaced with the following:¹
 10. “New stationary source” means any stationary source the construction or substantial modification of which commences after the expiry of two years from the date of entry into force for a Party of: (a) the present Protocol; or (b) an amendment to the present Protocol that, with respect to a stationary source, either introduces new limit values in annex V or introduces the category in annex II in which that source falls. It shall be a matter for the competent national authorities to decide whether a modification is substantial or not, taking into account such factors as the environmental benefits of the modification.
2. Add paragraph 12 to article 1 of the Protocol as follows:²
 12. “Countries with economies in transition (CET)” are countries as listed in Executive Body Decision 2006/13 or, if the Executive Body modifies the list in a subsequent decision, the latest such decision.
3. Add paragraph 13 to article 1 of the Protocol as follows:³
 13. “Particulate matter (PM₁₀ and PM_{2.5})”⁴ means:
 - (a) PM_{2.5}: The mass of particulate matter with an aerodynamic diameter equal to or less than 2.5 µm; and
 - (b) PM₁₀: The mass of particulate matter with an aerodynamic diameter equal to or less than 10 µm;
 - (c) For Parties that are countries with economies in transition, 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 analysed, and which remain upstream of the filter and on the filter after drying under specified conditions.

¹ The proposed text is in accordance with the revised text of the Protocol on Persistent Organic Pollutants (Protocol on POPs) as adopted by the Parties (Decision 2009/1).

² The proposed text is in accordance with the text proposed for revising the Gothenburg Protocol (ECE/EB.AIR/WG.5/2010/1).

³ As proposed by Belarus in informal document No. 13 to the forty-seventh session of the Working Group in September 2010.

⁴ Unless the contrary is expressly stated, all references to “particulate matter” in this Protocol are to both PM_{2.5} and PM₁₀.

B. Article 3: Basic obligations⁵

4. In paragraphs 2 (a) and (c) to article 3 of the Protocol, replace the words “for which annex III identifies best available techniques” with “for which guidance adopted by the Parties at a session of the Executive Body identifies best available techniques”.
5. After paragraph 2 (d), add a new paragraph 2 (e) as follows:
 - (e) For stationary sources for which the construction (if the source was never substantially modified) or last substantial modification commenced prior to the year 1990 [1995], Parties that are countries with economies in transition may, as an alternative to applying paragraphs (c) and (d), choose to require that such sources be closed or phased out according to the timescale in annex IV.
6. Paragraph 5 shall be replaced with the following:
 5. Each Party shall develop and maintain emission inventories for the heavy metals listed in annex I. Parties within the geographical scope of EMEP shall use the methodologies specified in guidelines prepared by the Steering Body to EMEP and adopted by the Parties at a session of the Executive Body. Parties in areas outside the geographical scope of EMEP shall use similar methodologies.
7. After paragraph 7, two new paragraphs shall be added as follows:
 8. Each Party should actively participate in programmes under the Convention on the effects of air pollution on human health and the environment and programmes on atmospheric monitoring and modelling, using guidelines adopted by Parties at a session of the Executive Body.
 9. The Parties may, subject to the outcome of the reviews provided for under article 10, paragraphs 2 and 3, and no later than one year after completion of that review, decide to commence negotiations on further obligations to reduce emissions.

C. Article 7: Reporting⁶

8. In article 7, paragraph 1 (a), after the first sentence, a second sentence shall be added as follows: “Where a Party applies different emission reduction strategies under article 3 paragraphs 2 (b), (c) and (d), it shall document the strategies applied and its compliance with the requirements of those paragraphs;”.
9. Paragraph 1 (b) shall be deleted and replaced by the following text:
 - (b) Each Party within the geographical scope of EMEP shall report [within its capacity], through the Executive Secretary of the Commission, to EMEP, on a periodic basis information on the levels of emissions of heavy metals using the methodologies specified in guidelines prepared by the Steering Body of EMEP and adopted by the Parties at a session of the Executive Body. Parties in areas outside the geographical scope of EMEP shall make available similar information if requested to do so by the Executive Body. Each Party shall also provide information on the levels of emissions of the substances listed in annex I for the reference year specified in that annex.

⁵ The proposed text is in accordance with the text proposed for revising the Gothenburg Protocol (ECE/EB.AIR/WG.5/2010/1).

⁶ The proposed text is in accordance with the text proposed for revising the Gothenburg Protocol (ECE/EB.AIR/WG.5/2010/1).

10. After paragraph 1 (b) a new paragraph 1 (c) shall be added as follows:
- (c) Each Party should report available information, through the Executive Secretary of the Commission, on air pollution effects programmes on human health and the environment and on atmospheric monitoring and modelling programmes under the Convention using guidelines adopted by the Parties at a session of the Executive Body.

D. [Article 13: Amendments to the Protocol]⁷

11. Paragraph 3 of article 13 shall be replaced by the following text:
3. Amendments to the present Protocol and to annexes I, II, IV, V VI [and VII] shall be adopted by consensus of the Parties present at a session of the Executive Body, and shall enter into force for the Parties which have accepted them on the ninetieth day after the date on which two thirds of those that were Parties at the time of their adoption have deposited with the Depositary their instruments of acceptance thereof. Amendments shall enter into force for any other Party on the ninetieth day after the date on which that Party has deposited its instrument of acceptance thereof. This paragraph shall be subject to paragraphs 5 bis and 5 ter below.
12. After paragraph 5, the following new paragraphs shall be added:
- 5 bis. For those Parties having accepted it, the procedure set out in paragraph 5 ter below shall supersede the procedure set out in paragraph 3 above in respect of amendments to annexes I, II, IV, V, VI [and VII].
- 5 ter. (a) Amendments to annexes I, II, IV, V VI [and VII] shall be adopted by consensus of the Parties present at a session of the Executive Body. On the expiry of one year from the date of its communication to all Parties by the Executive Secretary of the Commission, an amendment to any such annex shall become effective for those Parties which have not submitted to the Depositary a notification in accordance with the provisions of subparagraph (b) below;
- (b) Any Party that is unable to approve an amendment to annexes I, II, IV, V, VI [and VIII] shall so notify the Depositary in writing within one year from the date of the communication of its adoption. The Depositary shall without delay notify all Parties of any such notification received. A Party may at any time substitute an acceptance for its previous notification and, upon deposit of an instrument of acceptance with the Depositary, the amendment to such an annex shall become effective for that Party;
- (c) Any amendment to annexes I, II, IV, V, VI [and VIII] shall not enter into force if an aggregate number of 16 or more Parties have either:
- (i) Submitted a notification in accordance with the provisions of subparagraph (b) above; or
- (ii) Not accepted the procedure set out in this paragraph and not yet deposited an instrument of acceptance in accordance with the provisions of paragraph 3 above.]

⁷ The proposed text is in accordance with the revised text of the Protocol on POPs as adopted by the Parties (Decision 2009/1).

E. Article 15: Ratification, acceptance, approval and accession⁸

13. A new paragraph shall be added after article 15, paragraph 2, as follows:

3. A State or regional economic integration organization shall declare in its instrument of ratification, acceptance, approval or accession if it does not intend to be bound by the procedures set out in article 13, paragraph 5 ter, as regards the amendment of annexes I, II, IV, V, VI [and VIII].

II. Amendment proposals to the annexes to the Protocol

A. Annex I: Heavy metals referred to in article 3, paragraph 1, and the reference year for the obligation

14. In annex I, in the text on the reference year for cadmium, lead and mercury, after the first part of each of the sentences, reading “1990; or an alternative year from 1985 to 1995 inclusive,” replace the rest of the sentences by the following text (in bold):⁹

<i>Substance</i>	<i>Reference year</i>
Cadmium (Cd)	1990; or an alternative year from 1985 to 1995 inclusive, or for countries with economies in transition, an alternative year from 1985 to the year of the entry into force of the Protocol for a Party, and as specified by that Party upon ratification, acceptance, approval or accession
Lead (Pb)	1990; or an alternative year from 1985 to 1995 inclusive, or for countries with economies in transition, an alternative year from 1985 to the year of the entry into force of the Protocol for a Party, and as specified by that Party upon ratification, acceptance, approval or accession.
Mercury (Hg)	1990; or an alternative year from 1985 to 1995 inclusive, or for countries with economies in transition, an alternative year from 1985 to the year of the entry into force of the Protocol for a Party, and as specified by that Party upon ratification, acceptance, approval or accession.

B. Annex II: Stationary source categories¹⁰

15. In annex II, in the list of categories, for the description of category 5, after the word “zinc” the words “and manganese” shall be added, as follows:

⁸ The proposed text is in accordance with the revised text of the Protocol on POPs as adopted by the Parties (Decision 2009/1).

⁹ The proposed text is in accordance with the revised text of the POPs Protocol as adopted by the Parties (Decision 2009/1).

¹⁰ According to the Task Force on Heavy Metals, the two source categories (5 and 6) are considerable sources of mercury. This is why manganese production from ores and secondary aluminium production are therefore included in the categories 5 and 6, respectively.

<i>Category</i>	<i>Description of the category</i>
[5]	Installations for the production of copper, lead, zinc [and manganese] from ore, concentrates or secondary raw materials by metallurgical processes with a capacity exceeding 30 tons of metal per day for primary installations and 15 tons of metal per day for secondary installations, or for any primary production of mercury.

16. In annex II, in the list of categories, for the description of category 6, after the words “zinc” the words “and aluminium” shall be added, as follows:

<i>Category</i>	<i>Description of the category</i>
[6]	Installations for the smelting (refining, foundry casting, etc.), including the alloying, of copper, lead, zinc [and aluminium] including recovered products, with a melting capacity exceeding 4 tons per day for lead or 20 tons per day for copper and zinc.

C. **Annex III: Best available techniques for controlling emissions of heavy metals and their compounds from the source categories listed in annex II**

17. In paragraph 1 of annex III, add a second sentence that reads: “Further description of and guidance on such best available techniques are provided in a guidance document adopted by the Parties at a session of the Executive Body and may be updated as necessary by a consensus of the Parties meeting within the Executive Body.”

18. Amend annex III, paragraph 3, to read:

3. The information regarding emission control performance and costs is based on official documentation of the Executive Body and its subsidiary bodies, in particular documents received and reviewed by the Task Force on Heavy Metals, best available techniques (BAT) reference documents from the European Integrated Pollution Prevention and Control Bureau (EIPPCB), the 2002 Global Mercury Assessment of the United Nations Environment Programme (UNEP), and various technical reports from the United States Environmental Protection Agency, Environment Canada and the European Commission, and information provided by national experts.¹¹

19. In paragraph 4, replace the words “this annex may, therefore, need amending and updating” with the words “the guidance document referred to in paragraph 1 above may, therefore, need amending and updating”.

20. Delete the paragraphs 5 to 7 and sections II to IV of annex III, and move their contents into the guidance document referred to in paragraph 1 above.

¹¹ This text might be better placed in a guidance document due to its technical nature

D. Annex IV: Timescales for the application of limit values and best available techniques to new and existing stationary sources¹²

21. In annex IV, replace paragraph 1 (b) by the following text:
- (b) For existing stationary sources:
 - (i) Eight years after the date of entry into force of the present Protocol for a Party. If necessary, this period may be extended for specific existing stationary sources in accordance with the amortization period provided for by national legislation; or
 - (ii) For a Party that is a country with an economy in transition, up to fifteen years after the date of entry into force of the present Protocol for that Party.
22. After paragraph 1 (b), add new paragraphs 2 and 3, as follows:
2. The timescales for the application of limit values and best available techniques that have been updated or introduced as a result of amendment of this Protocol shall be:
- (a) For new stationary sources, two years after the date of entry into force of the relevant amendment for a Party; and
 - (b) For existing stationary sources:
 - (i) Eight years after the date of entry into force of the relevant amendment for a Party; or
 - (ii) For a Party that is a country with an economy in transition, up to fifteen years after the date of entry into force of the relevant amendment for that Party.
3. The timescales for the close or phase out of stationary sources according to article 3, paragraph 2 (e), of the Protocol shall be up to [five] [fifteen] years, effective [fifteen] [five] years after the date of entry into force of the Protocol for a Party.

E. Annex V: Limit values for controlling emissions from major stationary sources

23. The text in annex V shall be replaced by the text below.¹³

¹² The proposed text is in accordance with the revised text of the Protocol on POPs as adopted by the Parties (Decision 2009/1).

¹³ Explanations regarding the proposed changes to the text of annex V:

- The ELVs in annex V have been updated using the work carried out by the Task Force on Heavy Metals since the Protocol came into force in 2003. For most categories, for ELVs for dust (all except one where the Gothenburg Protocol makes no proposal for ELVs) the options from the Gothenburg Protocol were used in the current proposal. Footnote 5 explains the different ELV options with option 2 being in line with national regulations of most European Union (EU) member States and option 3 being less ambitious.
- The sectors are not fully congruent with those in the Gothenburg Protocol, as some of them are not relevant for the Gothenburg Protocol, such as chlor-alkali production or lead production. Inversely, most of the sources of the Gothenburg Protocol are not relevant for the heavy metal emissions.

I. Introduction

1. Two types of limit value are important for heavy metal emission control:

- (a) Values for specific heavy metals or groups of heavy metals; and
- (b) Values for emissions of particulate matter in general.

2. In principle, limit values for particulate matter cannot replace specific limit values for cadmium, lead and mercury, because the quantity of metals associated with particulate emissions differs from one process to another. However, compliance with these limits contributes significantly to reducing heavy metal emissions in general. Moreover, monitoring particulate emissions is generally less expensive than monitoring individual species. Therefore, particulate limit values are of great practical importance and are also laid down in this annex in most cases to complement or replace specific limit values for cadmium or lead or mercury.

3. Limit value means the quantity of a substance contained in the waste gases from an installation that is not to be exceeded. Limit values for particulate matter refer to the solid substance in the waste gases. Limit values for heavy metals include the solid, gaseous and vapour form of the metal and its compounds, expressed as the metal. Unless otherwise specified, it shall be calculated in terms of mass of pollutant per volume of the waste gases (expressed as mg/m³), assuming standard conditions for temperature and pressure for dry gas (volume at 273.15 K, 101.3 kPa). With regard to the oxygen content of exhaust gas, the values given in the tables below for each source category shall apply. Dilution for the purpose of lowering concentrations of pollutants in waste gases is not permitted. Start-up, shutdown and maintenance of equipment are excluded.

4. Emissions shall be monitored in all cases. Compliance with limit values shall be verified. The methods of verification can include continuous or discontinuous measurements, type approval, or any other technically sound method.¹⁴ In case of continuous measurement, compliance with the emission standards is achieved if the validated [daily/monthly] emission average does not exceed the limit values. In case of discontinuous measurement or other appropriate determination procedures, compliance with the emissions standards is achieved if the mean value based on an appropriate number of measurements under representative conditions does not exceed the value of the emission standard. The inaccuracy of the continuous and discontinuous measurement methods may be taken into account for verification purposes.

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- ELVs for heavy metals were proposed for the different categories. Many EU countries already apply limit values for these categories. The proposed limit values are linked to option 2 for dust. If option 1 for dust was to be chosen, the limit values for heavy metals could in most cases be lowered accordingly.
 - Only solid or liquid fuels are relevant for heavy metal emissions, therefore no additional category for gaseous fuels was included. In the Gothenburg Protocol, which focuses on dust, these fuels are taken into account.
 - Information on costs can be found in the background document of the Task Force on Heavy Metals (EB.AIR/WG.5/2007/15). The original data referred to in United States dollars, was not changed. The current Protocol on Heavy Metals contains comparable data.
 - Depending of the outcome of the negotiations on the Gothenburg Protocol, the introductory paragraphs 1 to 5 in annex V could be adjusted.

¹⁴ Indirect monitoring of substances is also possible via sum parameters/cumulative parameter (e.g., dust as sum parameter for heavy metals). In some cases using a certain technique to treat emissions can assure a value/limit value is maintained or met.

5. Sampling and analysis of relevant polluting substances and measurements of process parameters, as well as the quality assurance of automated measuring systems and the reference measurement methods to calibrate those systems shall be carried out in accordance with CEN standards. If CEN standards are not available, ISO standards, national or international standards which will ensure the provision of data of an equivalent scientific quality shall apply.

II. Specific limit values for selected major stationary sources¹⁵

6. The following emission limit values can be achieved by applying BAT:

Combustion of fossil fuels (annex II, category 1)

7. Combustion plants (boilers and process heaters) with a rated thermal input exceeding 50 MWth or combustion plants when combined to a common stack with a total rated input exceeding 50 MWth.¹⁶ Limit values refer to 6% O₂ in flue gas for solid fuels and to 3% O₂ for liquid fuels. These values do not apply to combustion plants running less than 500 hours a year. The competent authorities may grant derogations from the obligation to comply with the emission limit value for combustion plants not operated more than [XXX] operating hours, starting from [DATE] and ending no later than [DATE].

8. Limit value for particulate emissions for solid and liquid fuels (if not stated differently):

<i>Thermal input [MWth]</i>	<i>Heavy Metals Protocol 1998</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
New installations				
50 to 100	50 mg/m ³	[10]	[20]	[50]
Existing installations				
50 to 100	50 mg/m ³	[15]	[30]	[50]
New installations				
100 to 300	50 mg/m ³	[10]	[20]	[30]
Existing installations				
100 to 300	50 mg/m ³	[15]	[25]	[50]
New installations		solid fuel [10]		
> 300		liquid fuel [5]	[10]	[30]
Existing installations				
> 300		[10]	[20]	[50]

¹⁵ The proposed options for ELVs are in accordance with those proposed for the Gothenburg Protocol. They include:

Option 1: ELV 1 is a demanding but technically feasible option with the objective of achieving a high level of reduction.

Option 2: ELV 2, while technically demanding, pays greater attention to the costs of the measures for achieving reduction.

Option 3: ELV 3 represents current [good] practices based on the legislation of a number of Parties to the Convention.

¹⁶ Individual combustion plants below 15 MWth shall not be considered to calculate the total rated input.

9. Special provision for combustion plants:
- (a) For combustion plants larger than 50 MWth, the competent authority may grant derogation from the obligation to comply with the emission limit values provided for in paragraph [X] in the following cases:
 - (i) For combustion plants using [only/mainly] gaseous fuel who have to resort exceptionally to the use of other fuels because of a sudden interruption in the supply of gas and for this reason would need to be equipped with a waste gas purification facility;
 - (ii) [For combustion plants not operated more than XXX operating hours, starting from DATE and ending no later than DATE];
 - (b) Where a combustion plant is extended by at least 50MWth, the emission limit value specified in paragraph [X] for new installation shall apply to the extensional part and to the plant affected by the change;
 - (c) Parties shall ensure that provisions are made in the permits for procedures relating to malfunction or breakdown of the abatement equipment;
 - (d) In the case of a multi-fuel firing combustion plant involving the simultaneous use of two or more fuels, the competent authority shall provide rules for setting the emission limit values;
 - (e) In particular the, the limit values shall not apply to:
 - (i) Plants where the combustion process is an integrated part of a specific production, i.e., the coke oven used in the iron and steel industry and glass and ceramic production plants;
 - (ii) Plants in which the products of combustion are used for direct heating, drying, or any other treatment of objects or materials;
 - (iii) Post combustion plants designed to purify the waste gases by combustion which are not operated as independent combustion plants;
 - (iv) Facilities for the regeneration of catalytic cracking catalysts;
 - (v) Facilities for the conversion of hydrogen sulphide into sulphur;
 - (vi) Reactors used in the chemical industry;
 - (vii) Coke battery furnaces;
 - (viii) Cowpers;
 - (ix) Waste incinerators; and,
 - (x) Plants powered by diesel or petrol or combustion turbines, irrespective of the fuel used.
10. Limit value for cadmium emissions: [0.05] mg/m³.
11. Limit value for lead emissions: [0.5] mg/m³.
12. Limit value for mercury emissions: [0.03] mg/m³.

Processing of ferrous ores and primary iron and steel industry (annex II, category 2)Sinter plants (annex II, category 2) (>150 t/day)¹⁷

13. Limit value for particulate emissions:

	<i>HM Protocol 1998</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Limit value for particulate emissions	50 mg/m ³	[10] ^a	new installations [20] existing installations [50] ^a	[50]

Note: HM = heavy metals.

^a Averaged over a substantial period of time.

14. Limit value for cadmium emissions: [0.05] mg/m³.

15. Limit value for lead emissions: [1] mg/m³.

16. Limit value for mercury emissions: [0.05] mg/m³.

Pellet plants (annex II, category 2) (>150 t/day)

17. Limit value for particulate emissions:

	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Limit value for particulate emissions	[5] ^a	[10] ^a	[25]

^a Averaged over a substantial period of time.

18. Limit value for cadmium emissions: [0.05] mg/m³.

19. Limit value for lead emissions: [0.5] mg/m³.

20. Limit value for mercury emissions: [0.05] mg/m³.

Blast and oxygen furnaces including continuous casting (annex II, category 2) (>2.5 t/hour)

21. Limit value for particulate emissions:

<i>Limit value for particulate emissions</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Blast furnace: hot stoves	[5] ^a	[10] ^a	[50]
Basic oxygen steelmaking and casting; existing installations	[10] ^a	[30] ^a	[50]

^a Averaged over a substantial period of time.

22. Limit value for cadmium emissions: [0.05] mg/m³.

23. Limit value for lead emissions: [0.5] mg/m³.

24. Limit value for mercury emissions: [0.05] mg/m³.

¹⁷ The proposed limit values for sinter plants for the Gothenburg Protocol are less ambitious, making under option 2 no distinction between old and new installations (see ECE/EB.AIR/WG.5/2009/21, para. 11, table 6).

Secondary iron and steel industry (annex II, category 3)Electric arc furnaces (annex II, category 3) (> 2.5 t/hour)

25. Limit value for particulate emissions for existing and new installations:

	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Limit value for particulate emissions for existing installations	[10]	[15]	[20]
Limit value for particulate emissions for new installations	[5]	[5]	[20]

26. Limit value for cadmium emissions: [0.05] mg/m³.

27. Limit value for lead emissions: [0.5] mg/m³.

28. Limit value for mercury emissions: [0.05] mg/m³.

Iron foundries (annex II, category 4) (>20 t/day)

29. Limit value for particulate emissions:

<i>Limit value for particulate emissions</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
All furnaces (cupola, induction, rotary); All mouldings (lost, permanent)	[10]	[20]	[50]
Hot and cold rolling	[10]	[20]	[30]

30. Limit value for cadmium emissions: [0.05] mg/m³.

31. Limit value for lead emissions: [0.5] mg/m³.

32. Limit value for mercury emissions: [0.05] mg/m³.

Primary and secondary non-ferrous metal industry (annex II, categories 5 and 6)Production of primary and secondary non-ferrous metals except lead (annex II, categories 5 and 6)

33. Limit value for particulate emissions:

<i>Limit value for particulate emissions</i>	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Fabric filters, ceramic filters	[3]	[5]	[20]
Electrostatic precipitators	[7]	[12]	[20]
Scrubbers	[10]	[20]	[20]

34. The preferred technique for dust abatement is the use of fabric filters or ceramic filters. Electrostatic precipitators should be used for gases containing too much moisture, for hot gases, or when the dust is too sticky. Scrubbers should be used as the temperature or the nature of the gases precludes the use of other techniques, or when gaseous elements or acids have to be removed simultaneously with dust.

35. Limit value for cadmium emissions: [0.05] mg/m³.

36. Limit value for lead emissions: [1] mg/m³.

37. Limit value for mercury emissions: [0.05] mg/m³.

Production of lead (annex II, categories 5 and 6)¹⁸

38. Limit value for particulate emissions: [3/5/10] mg/m³.
 39. Limit value for cadmium emissions: [0.05] mg/m³.
 40. Limit value for lead emissions: [2] mg/m³.
 41. Limit value for mercury emissions: [0.05] mg/m³.

Cement industry (annex II, category 7)

42. Installations for the production of cement clinker in rotary kilns with a capacity > 500 Mg/day or in other furnaces with a production capacity exceeding 50 Mg/day.
 43. Limit values refer to 10% O₂ concentration in flue gas.

	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Limit value for particulate emissions	[15]	[20]	[50]

44. Limit value for cadmium emissions: [0.05] mg/m³.
 45. Limit value for lead emissions: [0.5] mg/m³.
 46. Limit value for mercury emissions: [0.05] mg/m³.

Glass industry (annex II, category 8)¹⁹

47. Limit values refer to different O₂ concentrations in flue gas depending on furnace type: tank furnaces (continuous melters): 8%; pot furnaces and day tanks (discontinuous melters): 13%.
 48. Limit value for particulate emissions:

	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
Limit value for particulate emissions	[10]	[20] GP [30]	[50]

Note: GP = Gothenburg Protocol.

49. Limit value for lead emissions: [0.5] mg/Nm³.
 50. Limit value for lead emissions in container glass production using foreign cullet: [0.8] mg/Nm³.
 51. Limit value for lead emissions in glass production if lead is required for product quality: [3] mg/Nm³.
 52. Limit value for cadmium emissions:[0.05] mg/Nm³.
 53. Limit value for cadmium emissions in container glass production: [0.5] mg/Nm³.
 54. Limit value for cadmium emissions if cadmium compounds are used as colouring agents for quality reasons: [0.2] mg/Nm³.

¹⁸ Note that the 1999 Gothenburg Protocol does not cover production of lead.

¹⁹ Note that the proposal for the Gothenburg Protocol is less ambitious and makes a distinction between old and new installations (see ECE/EB.Air/WG.5/2009/21, para. 12, table 9).

55. Limit value for mercury emissions: [0.05] mg/Nm³.
56. For oxy-fuel burners and electrical heating it is necessary to evaluate the performances only in terms of specific mass emissions (kg/ton²⁰ of glass melted).

Chlor-alkali industry (annex II, category 9)

57. Limit values refer to the total quantity of mercury released by a plant into the air, regardless of the emission source and expressed as an annual mean value.
58. Limit values for existing chlor-alkali plants using the mercury cell process:
[1.0 g per Mg]²¹ chlorine produced.
59. New chlor-alkali plants are to be operated mercury free.

Municipal waste incineration (> 3 t/hour), medical and hazardous waste incineration (> 1 t/hour) (annex II, categories 10 and 11)

60. Limit values refer to 11% O₂ concentration in flue gas for waste incineration; co-incineration in combustion installations: 6% O₂ for solid fuels and 6% O₂ for liquid fuels; co-incineration in cement kilns: 10% O₂.
61. Limit value for particulate emissions:

	<i>Option 1</i>	<i>Option 2</i>	<i>Option 3</i>
For waste incineration, co-incineration of waste with a thermal input from waste > 25%, and co-incineration in cement kilns with a thermal input from waste > 60%	[3]	[5]	[10]
For co-incineration of waste with a thermal input from waste < 25%, and co-incineration in cement kilns with a thermal input from waste < 60%	[5] no proposal in GP	[10] no proposal in GP	[10] no proposal in GP

Note: GP = Gothenburg Protocol.

62. Limit value for mercury emissions:
- (a) [0.03] mg/m³ for waste incineration and co-incineration;
- (b) [0.05] mg/m³ for co-incineration of waste in cement kilns if mercury emissions are due to raw material input.
63. Limit value for cadmium emissions: [0.05] mg/m³.
64. Limit value for lead emissions: [0.5] mg/m³.

F. Annex VI: Product control measures

24. In annex VI, paragraph 1, replace the value “0.013 g/l” in the first and second sentences by the value “0.005 g/l”. (Paragraphs 2–4 remain unchanged.)
25. Replace paragraph 5 with the following text:
5. Each Party shall prohibit, no later than 5 years, or 10 years for countries with economies in transition, the placing on the market of batteries that contain more than

²⁰ Unless otherwise specified, tons refers to metric tons.

²¹ See the recommendation for an ELV by the Task Force on Heavy Metals submitted to the Working Group on Strategies and Review in 2007 (EB.AIR/WG.5/2007/15)

0.0005% of mercury by weight, whether into appliances or not incorporated. The restriction shall not apply to:

- (a) Button cell batteries with a mercury content of no more than 2% mercury by weight; and
- (b) Mercury-containing batteries used in:
 - (i) Equipment connected with the protection of a Party's essential security interests, arms, munitions and war material, with the exclusion of products that are not intended for specifically military purposes;
 - (ii) Equipment designed to be sent into space.

26. After paragraph 5, add new paragraphs (6–11), as follows:

6. Each Party shall prohibit, no later than 5 years, or 10 years for countries with economies in transition, the placing on the market of: fever thermometers that contain mercury; and other measuring devices that contain mercury intended for sale to the general public (e.g., manometers, barometers, sphygmomanometers, thermometers other than fever thermometers). The restriction shall not apply to:

- (a) Measuring devices more than 50 years old [*on 3 October 2007*]; and
- (b) Marketing or use for research and development or analysis purposes.

7. Each party shall prohibit, no later than 5 years, or 10 years for countries with economies in transition, the placing on the market of vehicles if they contain mercury-containing materials and components exceeding 0.1% mercury by weight in homogenous materials. The restriction shall not apply to:

- (a) Discharge lamps for headlight application; and
- (b) Fluorescent tubes used in instrument panel displays.

These components shall be labelled or made identifiable to facilitate removal at end-of-life. The exemptions are valid for vehicles type approved before [*1 July 2012*] and spare parts for these vehicles.

8. Each party shall prohibit, no later than 5 years, or 10 years for countries with economies in transition, the placing on the market of new electrical and electronic equipment exceeding 0.1% mercury by weight in homogenous materials. The restriction shall not apply to:

- (a) Lamps, except for fluorescent lamps for which certain limit values apply;
- (b) Medical devices;
- (c) Monitoring and control instruments;
- (d) Electrical and electronic equipment designed for use with a voltage rating exceeding 1,000 volts for alternating current and 1,500 volts for direct current;
- (e) Large-scale stationary industrial tools; and
- (f) Spare parts for the repair, or to the reuse, of electrical and electronic equipment put on the market before [*1 July 2006*].

9. Each party shall prohibit, no later than 5 years, or 10 years for countries with economies in transition, the placing on the market of mercury-containing fluorescent lamps if their mercury content exceed, for:

- (a) Compact fluorescent lamps: 5 mg mercury per lamp; and
- (b) Straight fluorescent lamps for general purposes:
 - (i) 10 mg mercury for lamps with halophosphate;
 - (ii) 5 mg mercury for lamps with triphosphate and normal lifetime;
 - (iii) 8 mg mercury for lamps with triphosphate and long lifetime.

10. Each Party shall ensure the installation of amalgam separators at dentist practices within its territory.

11. Each Party shall set up a collection system for the mercury and mercury-containing products mentioned in the paragraphs 5–10 above, the aim being to dispose of the mercury in an environmentally sound manner.

G. Annex VII: Product management measures

27. In annex VII, paragraph 3, subparagraphs (a) to (d) shall be deleted. (Paragraphs 1 and 2 remain unchanged.)
