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Item 6 of the provisional agenda

Adoption of decisions

Draft decision on amending the text of and annexes II to IX to the Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone and the addition of new annexes X and XI

Note by the ad hoc group of legal experts

Summary

At its twenty-ninth session, the Executive Body for the Convention on Long-range Transboundary Air Pollution requested the ad hoc group of legal experts to prepare draft decision documents on amending the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) for consideration and adoption at the thirtieth session of the Executive Body. This document presents a draft decision on amending the Gothenburg Protocol and its annexes II to IX and adding new annexes X and XI, and is based on proposed amendments contained in documents ECE/EB.AIR/2012/1 and ECE/EB.AIR/2012/4–13.

Contents

	<i>Page</i>
Article 1: Amendment.....	2
Article 2: Relationship to the Gothenburg Protocol.....	91
Article 3: Entry into force.....	91

Draft Decision 2012/2
Amendment of the text of and annexes II to IX to the
1999 Protocol to Abate Acidification, Eutrophication
and Ground-Level Ozone and the addition of new annexes X
and XI

The Parties to the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, meeting within the thirtieth session of the Executive Body,

Decide to amend the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) to the Convention on Long-range Transboundary Air Pollution as follows:

Article 1
Amendment

A. Preamble

1. In the second preambular paragraph, the words “volatile organic compounds and reduced nitrogen compounds” are replaced by the words “volatile organic compounds, reduced nitrogen compounds and particulate matter”.
2. In the third preambular paragraph, the words “and particulate matter” are inserted after the word “ozone”.
3. In the fourth preambular paragraph, the words “sulphur and volatile organic compounds, as well as secondary pollutants such as ozone and” are replaced by the words “sulphur, volatile organic compounds, ammonia and directly emitted particulate matter, as well as secondarily formed pollutants such as ozone, particulate matter and”.
4. The following preambular paragraph is added between the fourth and fifth preambular paragraphs:

Recognizing the assessments of scientific knowledge by international organizations, such as the United Nations Environment Programme and the Arctic Council, about the health and climate co-benefits of reducing black carbon and ground-level ozone, particularly in the Arctic and in the Alpine regions,

5. In the sixth preambular paragraph, the words “nitrogen oxides and volatile organic compounds to address the transboundary ozone effect,” are replaced by the words “nitrogen oxides, sulphur dioxide and particulate matter to address the transboundary impacts of particulate matter,”.
6. For the seventh preambular paragraph there is substituted:

Recognizing furthermore that Canada is committed to achieving reductions of sulphur dioxide, nitrogen oxides, volatile organic compounds and particulate matter to meet the Canadian Ambient Air Quality standards for ozone and particulate matter and the national objective to reduce acidification, and that the United States is committed to the implementation of programmes to reduce emissions of nitrogen oxides, sulphur dioxide, volatile organic compounds and particulate matter necessary to meet national ambient air quality standards for ozone and particulate matter, to make continued progress in reducing acidification and eutrophication effects and to improve visibility in national parks and urban areas alike,

7. The ninth and tenth preambular paragraphs are replaced by the following preambular paragraphs:

Taking into account the scientific knowledge about the hemispheric transport of air pollution, the influence of the nitrogen cycle and the potential synergies with and trade-offs between air pollution and climate change,

Aware that emissions from shipping and aviation contribute significantly to adverse effects on health and the environment and are important issues under consideration by the International Maritime Organization and the International Civil Aviation Organization,

8. In the fifteenth preambular paragraph, the words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter”.
9. In the nineteenth preambular paragraph, the words “and particulate matter, including black carbon,” are inserted after the words “nitrogen compounds”.
10. The twentieth and twenty-first preambular paragraphs are deleted.
11. In the twenty-second preambular paragraph:
- (a) The words “and ammonia” are replaced by the words “and reduced nitrogen compounds”; and
 - (b) The words “and not increase nitrate levels in ecosystems” are inserted after the words “nitrous oxide”.
12. In the twenty-third preambular paragraph, the word “tropospheric” is replaced by the words “ground-level”.

B. Article 1

1. The words “, expressed as ammonia (NH₃)” are added at the end of paragraph 9.
2. The following paragraphs are added after paragraph 11:
- 11 bis. “Particulate matter” or “PM” is an air pollutant consisting of a mixture of particles suspended in the air. These particles differ in their physical properties (such as size and shape) and chemical composition. Unless otherwise stated, all references to particulate matter in this Protocol refer to particles with an aerodynamic diameter equal to or less than 10 microns (µm) (PM₁₀), including those with an aerodynamic diameter equal to or less than 2.5 µm (PM_{2.5});
- 11 ter. “Black carbon” means carbonaceous particulate matter that absorbs light;
- 11 quater. “Ozone precursors” means nitrogen oxides, volatile organic compounds, methane and carbon monoxide;
3. In paragraph 13, the words “or fluxes to receptors” are inserted after the word “atmosphere”.
4. In paragraph 15, the words “nitrogen oxides, volatile organic compounds or ammonia” are replaced by the words “nitrogen oxides, ammonia, volatile organic compounds or particulate matter”.
5. [For paragraph 16 there is substituted:
16. “New stationary source” means any stationary source of which the construction or substantial modification is commenced after the expiry of one year from the date of entry into force for a Party of the later of:

(a) The present Protocol; or

(b) An amendment to the present Protocol that, with respect to that stationary source, introduces new limit values in annexes IV to VI or X.

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.]¹

6. [A new paragraph 17 is added as follows:

17. “Countries with economies in transition” are countries as listed in Executive Body decision [2006/13 – delete] [2011/x] or, if the Executive Body modifies the list in a subsequent decision, the latest such decision.]²

C. Article 2

1. In the chapeau:

(a) “1.” is inserted before the words “The objective of the present Protocol”;

(b) The words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter”;

(c) The words “and the environment” are inserted after “human health”;

(d) The words “materials and crops” are replaced by the words “materials, crops and the climate in the short and long term”; and

(e) The words “and particulate matter” are inserted after the word “eutrophication”.

2. The words “that allow ecosystem recovery” are inserted at the end of subparagraph (a).

3. In subparagraph (b), the words “that allow ecosystem recovery” are added at the end of the subparagraph and the word “and” is deleted after the semicolon.

4. A new subparagraph (b bis) is inserted after subparagraph (b) as follows:

(b bis) For particulate matter:

(i) For Parties within the geographical scope of EMEP, the critical levels of particulate matter, as given in annex I;

(ii) For Canada, the Canadian Ambient Air Quality Standards for particulate matter; and

(iii) For the United States of America, the National Ambient Air Quality Standards for particulate matter;

5. In subparagraph (c) (ii), the words “Canada-wide Standard” are replaced by the words “Canadian Ambient Air Quality Standards”.

6. New subparagraphs (d) and (e) are added after subparagraph (c) as follows:

(d) For Parties within the geographical scope of EMEP, the critical levels of ammonia, as given in annex I; and

¹ Not yet agreed.

² Not yet agreed.

(e) For Parties within the geographical scope of EMEP, the acceptable levels of air pollutants to protect materials, as given in annex I.

7. A new paragraph 2 is added at the end of article 2 as follows:
 2. A further objective is that Parties should, in implementing measures to achieve their national targets for particulate matter, give priority, to the extent they consider appropriate, to emission reduction measures which also significantly reduce black carbon in order to provide benefits for health, environment and to help mitigation of near-term climate change.

D. Article 3

1. In paragraph 1:
 - [(a) The words “and/or emission reduction percentage target” are inserted after both instances of the word “ceiling”; and]³
 - (b) The following sentence is added at the end of the paragraph: “In taking steps to reduce emissions of particulate matter, each Party should seek reductions from those source categories known to emit high amounts of black carbon, to the extent it considers appropriate.”
2. In paragraphs 2 and 3, Roman numerals “V and VI” are replaced by Roman numerals “V, VI and X”.
3. Paragraph 4 is deleted.
4. For paragraph 6 there is substituted:

Each Party should apply best available techniques to mobile sources covered by annex VIII and to each stationary source covered by annexes IV, V, VI and X, and, as it considers appropriate, measures to control black carbon as a component of particulate matter taking into account guidance adopted by the Executive Body.
5. For paragraph 7 the following text is substituted:

Each Party shall, insofar as it is technically and economically feasible, and taking into consideration the costs and benefits, apply the limit values for VOC contents of products as identified in annex XI [in accordance with the timescales set out in annex VII].⁴
6. [In paragraph 8 (a):
 - (a) The words “part A of” are inserted after the words “specified in”; and
 - (b) The words “as an alternative, a Party may apply different emission reduction strategies that achieve equivalent overall emission levels for all source categories covered by part A” are inserted after the words “annex IX”.]⁵
7. In paragraph 8 (b):
 - [(a) The words “the control measures specified in part B of annex IX and” are inserted after the word “appropriate,”;]⁶

³ Not yet agreed.

⁴ Not yet agreed.

⁵ Not yet agreed.

⁶ Not yet agreed.

(b) The words “document V” and “at its seventeenth session (decision 1999/1) and any amendments thereto” are deleted.

8. In paragraph 9 (b), the words “ammonia and/or volatile organic compounds contributing to acidification, eutrophication or ozone formation” are replaced by the words “ammonia, volatile organic compounds and/or particulate matter contributing to acidification, eutrophication, ozone formation or increased levels of particulate matter”.

9. In paragraph 10 (b), the words “sulphur and/or volatile organic compounds” are replaced by the words “sulphur, volatile organic compounds and particulate matter”.

10. In paragraph 11, the words “nitrogen oxides and volatile organic compounds” are replaced by the words “nitrogen oxides, volatile organic compounds and particulate matter”.

11. New paragraphs are added after paragraph 11 as follows:

11 bis. Canada shall also upon ratification, acceptance or approval of or accession to the present Protocol submit to the Executive Body relevant limit values for automatic incorporation into annexes IV, V, VI, VIII, X and XI.

11 ter. Each Party shall develop and maintain inventories and projections for the emissions of sulphur dioxide, nitrogen oxides, ammonia, volatile organic compounds and particulate matter. Parties within the geographic scope of EMEP shall use 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 geographic scope of EMEP shall use as guidance the methodologies developed through the workplan of the Executive Body.

11 quater. Each Party should actively participate in programmes under the Convention on the effects of air pollution on human health and the environment.

[11 quinquies.

(a) [The EMEP Steering Body shall, following a request from the Executive Body, develop guidance on exceptional circumstances by virtue of which a] [Each] Party may apply an inventory adjustment procedure for the purpose of comparing national emission totals with emission reduction commitments as set out in paragraph 1 above. The details of such an inventory adjustment procedure shall also be developed by the EMEP Steering Body and adopted by a Party at a session of the Executive Body;

(b) Following adoption by the Executive Body of the guidance referred to in paragraph (a) above, a Party that decides to apply the inventory adjustment procedure shall apply it as part of reporting its annual emissions in accordance with article 7 of this Protocol;

(c) A Party that is a country with an economy in transition may review the values of national emissions ceilings determined on the basis of national methodologies in the case of their transition to methodologies for the evaluation of emissions adopted within the framework of the Convention.]⁷

[12. In paragraph 12, the words “of the Protocol as amended” are inserted after the words “first review”].⁸

⁷ 11 quinquies not yet agreed.

⁸ Not yet agreed.

The proposals in respect of articles 4–19 inclusive as set out below have not yet been discussed or agreed by the Parties meeting in the Executive Body.

[E. Article 4

1. In paragraph 1, the words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter, including black carbon”.
2. In paragraph 1 (a), the words “low emission burners and good environmental practice in agriculture” are replaced by the words “low emission burners, good environmental practice in agriculture and measures that are known to mitigate emissions of black carbon as a component of particulate matter”.

F. Article 5

1. In paragraph 1 (a), the words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter, including black carbon”.
2. For paragraph 1 (c) is substituted:
 - (c) Levels of ground-level ozone and particulate matter;
3. In paragraph 1 (d), the word “and” is inserted after the semicolon.
4. A new paragraph 1 (e) is added as follows:
 - (e) The environmental and health improvements associated with attaining emission ceilings for 2020 as listed in annex II, as presented in guidance adopted by the Executive Body.
5. In paragraph 2 (e):
 - (a) The words “Health and environmental” are replaced by the words “Health, environmental and climate”; and
 - (b) The words “reduction of” are inserted after the words “associated with”.

G. Article 6

1. In paragraph 1 (b), the words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter”.
2. In paragraph 1 (f), the words “documents I to V” and “at its seventeenth session (decision 1999/1) and any amendments thereto” are deleted.
3. In paragraph 1 (g), the words “document VI” and “at its seventeenth session (decision 1999/1) and any amendments thereto” are deleted.
4. In paragraph 1 (h), the words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter”.
5. For paragraph 2 is substituted:
 2. Each Party shall collect and maintain information on ambient concentrations and depositions of sulphur and nitrogen compounds, and ambient concentrations and where feasible depositions of volatile organic compounds, ozone and particulate matter and their effects on human health, terrestrial and aquatic ecosystems, materials and the climate. Parties within the geographic scope of EMEP should use guidelines adopted by the Executive Body. Parties outside the geographic scope of EMEP should use as guidance the methodologies developed through the workplan

of the Executive Body. Each Party should, to the extent it considers appropriate, also develop and maintain inventories and projections for emissions of black carbon, using guidelines adopted by the Executive Body.

H. Article 7

1. For the chapeau of paragraph 1 (b) is substituted:

(b) Each Party within the geographical scope of EMEP shall, for the emissions of sulphur dioxide, nitrogen oxides, ammonia, volatile organic compounds and particulate matter, on the basis of guidelines prepared by the Steering Body of EMEP and adopted by the Executive Body, report the following information to EMEP through the Executive Secretary of the Commission:

2. In paragraph 1 (b) (i), the words “of sulphur, nitrogen oxides, ammonia and volatile organic compounds” are deleted.

3. In paragraph 1 (b) (ii):

(a) The words “of each substance” are deleted; and

(b) For the number “(1990)” the words “as specified in annex II” are substituted.

4. In paragraph 1 (b) (iii), the words “and current reduction plans” are deleted.

5. For paragraph 1 (b) (iv) is substituted:

(iv) An Informative Inventory Report containing detailed information on reported emission inventories and emission projections, including specification of the effect of new sources and new emission factors found after the adoption of the Protocol.

6. A new paragraph 1 (b bis) is added as follows:

(b bis) Each Party within the geographical scope of EMEP should report available information to the Executive Body, through the Executive Secretary of the Commission, on air pollution effects programmes on human health and the environment and atmospheric monitoring and modelling programmes under the Convention, using guidelines adopted by the Executive Body;

7. In paragraph 1 (c), the words “Parties in areas outside the geographical scope of EMEP should make available information similar to that specified in subparagraph (b bis), if requested to do so by the Executive Body.” are added at the end of the paragraph.

8. New subparagraphs (d) and (e) are added after subparagraph 1 (c) as follows:

[(d) Each Party within the geographical scope of EMEP shall establish and report, through the Executive Secretary of the Commission, to EMEP on national nitrogen budgets [annually (option A)] [every three years (option B)] [every five years (option C)] in order to monitor changes in overall losses of reactive nitrogen from the different sources, including emissions of ammonia, nitrogen oxides and nitrous oxide to air and the leaching of nitrogen to groundwater and surface water, following the principles of the guidance adopted by the Executive Body. The first report shall be made one year after the entry into force of the Protocol ensuring consistency on the same year for all Parties;]

(e) Each Party should also report, where available, its emissions inventories and projections for emissions of black carbon, using guidelines adopted by the Executive Body.

9. In the chapeau to paragraph 3:
 - (a) The words “of the” are deleted; and
 - (b) The words “EMEP shall provide” are replaced by “shall receive from its subsidiary bodies”.
10. In paragraph 3 (a), the words “particulate matter including black carbon,” are inserted after the words “concentrations of”.
11. In paragraph 3 (b), the words “ozone and its” are replaced by “particulate matter, ozone and their”.
12. New subparagraphs (c) and (d) are inserted after subparagraph 3 (b) as follows:
 - [(c) Adverse effects on human health, natural ecosystems, materials, and crops including interactions with climate change and the environment related to the substances in this Protocol, and progress in achieving health and environmental improvements as described in [guidance adopted by the Executive Body]; and]
 - [(d) The calculation of nitrogen use efficiency and nitrogen surpluses and their improvements within the geographical area of EMEP, based on the national nitrogen budgets reported by the Parties.]
13. In the final subparagraph of paragraph 3:
 - (a) “[3 bis]” is inserted before the words “Parties in areas”; and
 - (b) The words “similar information” are replaced by the words “information similar to that specified in paragraph 3”.
14. In paragraph 4, the words “and particulate matter” are added at the end of the paragraph.
15. In paragraph 5, the words “actual ozone concentrations and the critical levels of ozone” are replaced by the words “actual ozone and particulate matter concentrations and the critical levels of ozone and particulate matter”.
16. A new paragraph 6 is added as follows:
 - [6. A Party that is a country with an economy in transition may [request to] report emissions limited to large point sources, for a period of up to five years after the date of entry into force of the Protocol for the Party in question.]

I. Article 8

1. In paragraph (b), the words “particulate matter, including black carbon,” are inserted after the words “those on”.
2. In paragraph (c), the words “nitrogen compounds and volatile organic compounds” are replaced by the words “nitrogen compounds, volatile organic compounds and particulate matter, including black carbon”.
3. After paragraph (d), a new paragraph (d bis) is added as follows:
 - [(d bis) The improvement of the scientific understanding of the potential co-benefits for climate change mitigation associated with potential reduction scenarios for air pollutants (such as methane, carbon monoxide and black carbon) which have near-term radiative forcing and other climate effects;]
4. In paragraph (e), the words “eutrophication and photochemical pollution” are replaced by the words “eutrophication, photochemical pollution and particulate matter”.

5. In paragraph (f), the words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds [and][,] [other ozone precursors] [and particulate matter]”.
6. In paragraph (g):
 - (a) The words “nitrogen and volatile organic compounds” are replaced by the words “nitrogen, volatile organic compounds and particulate matter”;
 - (b) The words “including their contribution to concentrations of particulate matter” are deleted; and
 - (c) The words “volatile organic compounds and tropospheric ozone” are replaced by the words “volatile organic compounds, particulate matter and ground-level ozone”.
7. In paragraph (k):
 - (a) The words “environment and human health” are replaced by the words “environment, human health and the climate”; and
 - (b) The words “ammonia and volatile organic compounds” are replaced by the words “ammonia, volatile organic compounds and particulate matter”.

J. Article 10

1. In paragraph 1, the words “sulphur and nitrogen compounds” are replaced by the words “sulphur, nitrogen compounds and particulate matter”.
2. In paragraph 2 (b):
 - (a) The words “climate co-benefits” are inserted after the words “health effects,”; and
 - (b) The words “particulate matter” are inserted after the words “related to”.
3. A new paragraph 3 is added as follows:
 3. The Parties shall, no later than at the second session of the Executive Body after entry into force of this amendment, evaluate mitigation measures for black carbon and consider the need for revising the guidance document or amending annexes VIII and X, keeping in mind the circumstances of countries with economies in transition.

K. Article 13

1. In paragraph 1, the words “[Any Party may propose an adjustment of the emission levels, the base year and the emission ceiling for particulate matter. These adjustments need to be detailed in the Informative Inventory Report of that Party.]” are added at the end of the paragraph.
2. In paragraph 3:
 - (a) The words “including amendments to annexes II to IX” are replaced by the words “[and, subject to paragraphs 5 bis and 5 ter below] to annexes II and IV to XI”; and
 - (b) The words “two thirds of the Parties have deposited” are replaced by the words “two thirds of those that were Parties at the time of their adoption have deposited”.
3. In paragraph 4:
 - (a) The words “the annexes to the present Protocol” are replaced by the words “annexes I and III to the present Protocol”;

(b) The words “, other than to the annexes referred to in paragraph 3” are deleted; and

(c) The word “ninety” is replaced by the words “one hundred and eighty”.

4. In paragraph 5:

(a) The words “an annex” are replaced by the words “annexes I and III”; and

(b) The words “, other than to an annex referred to in paragraph 3” are deleted.

5. New paragraphs 5 bis and 5 ter are added after paragraph 5 as follows:

[5 bis. Amendments to annexes II and IV to XI 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 (a) below:

(a) Any Party that is unable to approve an amendment to annexes II and IV to XI 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;

(b) Any amendment to annexes II and IV to XI shall not enter into force if an aggregate number of sixteen or more Parties have either:

(i) Submitted a notification in accordance with the provisions of subparagraph (a) 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.

5 ter. For those Parties having accepted it, the procedure set out in paragraph 5bis above supersedes the procedure set out in paragraph 3 above in respect of amendments to annexes II and IV to XI.]

6. In paragraph 6, the words “annex II” are replaced by the words “annexes II [and III]”.

L. Article 15

A new paragraph 4 is added as follows:

[4. Any Party that was not already a Party on [xxx date] shall declare in its instrument of ratification, acceptance, approval or accession if it does not intend to be bound by the procedure set out in article 13, paragraph 5 bis, as regards the amendment of annexes II and IV to XI.]

M. New article 18 bis

A new article 18 bis is added after article 18 as follows:

[Article 18 bis Termination of Protocols

When all of the Parties to each of the following Protocols have deposited their instruments of ratification, acceptance, approval of or accession to this Protocol with the Depository in accordance with article 15, each of those Protocols shall be considered as terminated:

- (a) The 1985 Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent;
- (b) The 1988 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes;
- (c) The 1991 Geneva Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes;
- (d) The 1994 Oslo Protocol on Further Reduction of Sulphur Emissions.]⁹

N. Annex II

For annex II the following text is substituted:

Emission ceilings for 2010 and emission reduction obligations for 2020 and beyond

1. The emission ceilings and emission reduction obligations listed in the tables below relate to the provisions of article 3, paragraphs 1 and 10, of the revised Gothenburg Protocol.

2. Table 1 includes the emission ceilings for 2010 and beyond expressed in thousands of metric tons for those Parties that ratified the Gothenburg Protocol.

3. Tables 2–6 include emission reduction obligations for sulphur dioxide (SO₂), nitrogen oxides (NO_x), ammonia (NH₃), volatile organic compounds (VOCs) and particulate matter with an aerodynamic diameter equal to or less than 2.5 µm (PM_{2.5}) for 2020 and beyond. These obligations are expressed in the percentage reduction from the 2005 level (the 2005 level minus the 2020 level divided by the 2005 level).

4. The 2005 emission levels listed in tables 2–6 are given for information purposes only. Emission levels for 2005 are in metric tons and are based on the emissions officially reported [by Parties] to EMEP in 2012. The 2005 emission data is provisional and will be updated by the Parties when better information becomes available in later years.

[Data for 2005 have been preliminary taken from the CIAM report 4/2011. Data in *italics* are taken from the EMEP Status report 1/2011. Emission data from CIAM are based on fuels sold and on harmonised "real world" emission factors for vehicles in the geographical scope of EMEP. NO_x-emissions from agricultural soils and VOC-emissions from crops were excluded – delete].

5. If a Party finds that the 2005 data were exceptional, due to a particularly cold winter, a particularly dry summer or unforeseen variations in economic activities,

⁹ Proposals in respect of articles 4–19 inclusive have not yet been discussed or agreed by the Parties meeting in the Executive Body.

such as a loss of capacity in the power supply system domestically or in a neighbouring country, it may present an alternative level by averaging its national annual emissions for 2004, 2005 and 2006 and report the reasons and the method used to achieve the three-year average to the Implementation Committee.

6. If in a given year [before 2025 – delete] a Party finds that, due to a particularly cold winter, a particularly dry summer or unforeseen variations in economic activities, such as a loss of capacity in the power supply system domestically or in a neighbouring country, it cannot comply with its obligations for 2020 and beyond, it may fulfil those obligations by averaging its national annual emissions for the year in question, the year preceding that year and the year following it, provided that the emission level in any single year is not more than 20 per cent above the emission ceiling. The reason for exceedance in any given year and the method by which the three-year average figure will be achieved shall be reported to the Implementation Committee.

Table 1

Emission ceilings for 2010 and beyond for Parties that ratified the Gothenburg Protocol

	<i>Party</i>	<i>Ratification</i>	<i>SO₂</i>	<i>NO_x</i>	<i>NH₃</i>	<i>VOCs</i>
1	Belgium	2007	106	181	74	144
2	Bulgaria	2005	856	266	108	185
3	Croatia	2008	70	87	30	90
4	Cyprus	2007	39	23	9	14
5	Czech Republic	2004	283	286	101	220
6	Denmark	2002	55	127	69	85
7	Finland	2003	116	170	31	130
8	France	2007	400	860	780	1 100
9	Germany	2004	550	1 081	550	995
10	Hungary	2006	550	198	90	137
11	Latvia	2004	107	84	44	136
12	Lithuania	2004	145	110	84	92
13	Luxembourg	2001	4	11	7	9
14	Netherlands	2004	50	266	128	191
15	Norway	2002	22	156	23	195
16	Portugal	2005	170	260	108	202
17	Romania	2003	918	437	210	523
18	Slovakia	2005	110	130	39	140
19	Slovenia	2004	27	45	20	40
20	Spain ^a	2005	774	847	353	669
21	Sweden	2002	67	148	57	241
22	Switzerland	2005	26	79	63	144
23	The former Yugoslav Republic of Macedonia	2010	81	29	16	19
24	United Kingdom of Great Britain and Northern Ireland	2005	625	1 181	297	1200

	<i>Party</i>	<i>Ratification</i>	<i>SO₂</i>	<i>NO_x</i>	<i>NH₃</i>	<i>VOCs</i>
25	United States of America	2044	14 527 ^b	6 348 ^c		4 511 ^d
26	European Union ^e	2003	4 059	6 671	3129	6 600

^a Figures apply to the European part of the country.

^b Applies to the United States PEMA for sulphur: the total territory of the United States with the exception of Alaska and Hawaii.

^c Applies to the United States PEMA for NO_x — the District of Columbia plus 18 states: Connecticut, Delaware, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin.

^d Applies to the United States PEMA for VOCs — the District of Columbia plus 18 states: Connecticut, Delaware, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin.

^e Figures apply to the 15 member countries of the EU on 1 May 2004, awaiting formal adjustment of the figures to the totals for all of the 27 EU member States, following article 13, paragraph 1, of the Gothenburg Protocol.

Table 2
Emission reduction obligation for sulphur dioxide for 2020 and beyond

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of SO₂</i>	<i>Reduction from 2005 level (%)</i>
1	Albania	19	
2	Armenia	26	
3	Austria	27	
4	Azerbaijan	129	
5	Belarus	85	
6	Belgium	145	
7	Bosnia and Herzegovina	225	
8	Bulgaria	777	
9	Canada ^a		
10	Croatia	63	
11	Cyprus	39	
12	Czech Republic	219	
13	Denmark	23	
14	Estonia	76	
15	Finland	69	
16	France	462	
17	Georgia	13	
18	Germany	517	
19	Greece	542	
20	Hungary	129	
21	Iceland	7	
22	Ireland	71	
23	Italy	402	
24	Kazakhstan	3 309	
25	Kyrgyzstan	26	

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of SO₂</i>	<i>Reduction from 2005 level (%)</i>
26	Latvia	7	
27	Liechtenstein		
28	Lithuania	44	
29	Luxembourg	3	
30	Malta	17	
31	Monaco		
32	Montenegro	15	
33	Netherlands ^b	65	
34	Norway	24	
35	Poland	1 222	
36	Portugal	179	
37	Republic of Moldova	7	
38	Romania	643	
39	Russian Federation ^b	1 973	
40	Serbia	440	
41	Slovakia	89	
42	Slovenia	40	
43	Spain ^b	1 235	
44	Sweden	36	
45	Switzerland	16	20
46	The former Yugoslav Republic of Macedonia	100	
47	Turkey	1 417	
48	Ukraine	1 063	
49	United Kingdom	697	
50	United States ^[c]	[12 965]	
51	European Union ^d	7 773	55

^a Upon ratification, acceptance or approval of, or accession to, the present Protocol, Canada shall provide: (a) a value for total estimated sulphur emission levels for 2005, either national or for its PEMA; and (b) an indicative value for a reduction of total sulphur emission levels for 2020 from 2005 levels, either at the national level or for its PEMA. Item (a) will be included in the table, and item (b) will be included in a footnote to the table. The PEMA, including any changes when Canada becomes a Party to the Protocol, will be included in annex III to the Protocol.

^b Figures apply to the European part of the country.

^[c] Upon ratification, acceptance or approval of, or accession to the amendment adding this table to the Protocol, the United States shall provide: (a) an indicative value for a reduction of total sulphur emission levels for 2020 from 2005 levels for the appropriate PEMA; and (b) any changes to the PEMA identified when the United States became a Party to the Protocol. Item (a) will be included in a footnote to the table and item (b) will be included in annex III to the Protocol.]

^d Preliminary position of the EU.

Table 3
Emission reduction obligation for nitrogen oxides for 2020 and beyond

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of NO₂</i>	<i>Reduction from 2005 level (%)</i>
1	Albania	21	
2	Armenia	6	
3	Austria	38	
4	Azerbaijan	76	
5	Belarus	167	
6	Belgium	302	
7	Bosnia and Herzegovina	35	
8	Bulgaria	183	
9	Canada ^a		
10	Croatia	69	
11	Cyprus	22	
12	Czech Republic	290	
13	Denmark	178	
14	Estonia	35	
15	Finland	187	
16	France	1 303	
17	Georgia	16	
18	Germany	1 388	
19	Greece	331	
20	Hungary	174	
21	Iceland	4	
22	Ireland	181	
23	Italy	1 219	
24	Kazakhstan	757	
25	Kyrgyzstan	63	
26	Latvia	34	
27	Liechtenstein		
28	Lithuania	60	
29	Luxembourg	51	
30	Malta	9	
31	Monaco	0.4	
32	Montenegro	8	
33	Netherlands ^b	362	
34	Norway	180	
35	Poland	786	
36	Portugal	769	
37	Republic of Moldova	25	
38	Romania	292	

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of NO₂</i>	<i>Reduction from 2005 level (%)</i>
39	Russian Federation ^b	3 106	
40	Serbia	157	
41	Slovakia	96	
42	Slovenia	49	
43	Spain ^b	1 445	
44	Sweden	206	
45	Switzerland	84	43
46	The former Yugoslav Republic of Macedonia	32	
47	Turkey	1 080	
48	Ukraine	906	
49	United Kingdom	1 493	
50	United States ^c	18 443	
51	European Union ^d	11 103	40

^a Upon ratification, acceptance or approval of, or accession to, the present Protocol, Canada shall provide: (a) a value for total estimated nitrogen oxide emission levels for 2005, either national or for its PEMA, if it has submitted one; and (b) an indicative value for a reduction of total nitrogen oxide emission levels for 2020 from 2005 levels, either at the national level or for its PEMA. Item (a) will be included in the table, and item (b) will be included in a footnote to the table. The PEMA, if submitted, will be included in annex III to the Protocol.

^b Figures apply to the European part of the country.

^c Upon ratification, acceptance or approval of, or accession to the amendment adding this table to the Protocol, the United States shall provide: (a) an indicative value for a reduction of total nitrogen oxide emission levels for 2020 from 2005 levels for the appropriate PEMA; and (b) any changes to the PEMA identified when the United States became a Party to the Protocol. Item (a) will be included in a footnote to the table and item (b) will be included in annex III to the Protocol.

^d Preliminary position of the EU.

Table 4
Emission reduction obligation for ammonia for 2020 and beyond

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of NH₃</i>	<i>Reduction from 2005 level (%)</i>
1	Albania	17	
2	Armenia	17	
3	Austria	61	
4	Azerbaijan	48	
5	Belarus	117	
6	Belgium	75	
7	Bosnia and Herzegovina	18	
8	Bulgaria	64	
9	Canada		
10	Croatia	29	
11	Cyprus	6	

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of NH₃</i>	<i>Reduction from 2005 level (%)</i>
12	Czech Republic	80	
13	Denmark	73	
14	Estonia	12	
15	Finland	34	
16	France	1 303	
17	Georgia	16	
18	Germany	1 388	
19	Greece	331	
20	Hungary	174	
21	Iceland	4	
22	Ireland	181	
23	Italy	1 219	
24	Kazakhstan	757	
25	Kyrgyzstan	63	
26	Latvia	34	
27	Liechtenstein		
28	Lithuania	60	
29	Luxembourg	51	
30	Malta	9	
31	Monaco	0.4	
32	Montenegro	8	
33	Netherlands ^a	362	
34	Norway	180	
35	Poland	786	
36	Portugal	769	
37	Republic of Moldova	25	
38	Romania	292	
39	Russian Federation ^a	3 106	
40	Serbia	157	
41	Slovakia	96	
42	Slovenia	49	
43	Spain ^a	1 445	
44	Sweden	206	
45	Switzerland	84	43
46	The former Yugoslav Republic of Macedonia	32	
47	Turkey	1 080	
48	Ukraine	906	
49	United Kingdom	1 493	

<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of NH₃</i>	<i>Reduction from 2005 level (%)</i>
50 United States	18 443	
51 European Union ^b	11 103	5

^a Figures apply to the European part of the country.

^b Preliminary position of the EU.

Table 5
Emission reduction obligation for Volatile Organic Compounds for 2020 and beyond

<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of VOC</i>	<i>Reduction from 2005 level (%)</i>
1 Albania	32	
2 Armenia	49	
3 Austria	171	
4 Azerbaijan	234	
5 Belarus	203	
6 Belgium	168	
7 Bosnia and Herzegovina	43	
8 Bulgaria	135	
9 Canada ^a		
10 Croatia	103	
11 Cyprus	11	
12 Czech Republic	264	
13 Denmark	133	
14 Estonia	37	
15 Finland	147	
16 France	1 267	
17 Georgia	214	
18 Germany	1 287	
19 Greece	307	
20 Hungary	159	
21 Iceland	8	
22 Ireland	68	
23 Italy	1 767	
24 Kazakhstan	236	
25 Kyrgyzstan	25	
26 Latvia	68	
27 Liechtenstein		
28 Lithuania	82	
29 Luxembourg	15	
30 Malta	4	

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of VOC</i>	<i>Reduction from 2005 level (%)</i>
31	Monaco	0.5	
32	Montenegro	10	
33	Netherlands ^b	227	
34	Norway	224	
35	Poland	552	
36	Portugal	233	
37	Republic of Moldova	31	
38	Romania	459	
39	Russian Federation ^b	3 041	
40	Serbia	153	
41	Slovakia	72	
42	Slovenia	45	
43	Spain ^b	944	
44	Sweden	199	
45	Switzerland	121	32
46	The former Yugoslav Republic of Macedonia	23	
47	Turkey	1 105	
48	Ukraine	685	
49	United Kingdom	989	
50	United States ^c	15 841	
51	European Union ^d	9 809	25

^a Upon ratification, acceptance or approval of, or accession to, the present Protocol, Canada shall provide: (a) a value for total estimated VOC emission levels for 2005, either national or for its PEMA, if it has submitted one; and (b) an indicative value for a reduction of total VOC emission levels for 2020 from 2005 levels, either at the national level or for its PEMA. Item (a) will be included in the table, and item (b) will be included in a footnote to the table. The PEMA, if submitted, will be included in annex III to the Protocol.

^b Figures apply to the European part of the country.

^c Upon ratification, acceptance or approval of, or accession to the amendment adding this table to the Protocol, the United States shall provide: (a) an indicative value for a reduction of total VOC emission levels for 2020 from 2005 levels for the appropriate PEMA; and (b) any changes to the PEMA identified when the United States became a Party to the Protocol. Item (a) will be included in a footnote to the table and item (b) will be included in annex III to the Protocol.

^d Preliminary position of the EU.

Table 6
Emission reduction obligation for particulate matter for 2020 and beyond

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of PM_{2.5}</i>	<i>Reduction from 2005 level (%)</i>
1	Albania	9	
2	Armenia	1	
3	Austria	22	

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of PM_{2.5}</i>	<i>Reduction from 2005 level (%)</i>
4	Azerbaijan	5	
5	Belarus	53	
6	Belgium	28	
7	Bosnia and Herzegovina	20	
8	Bulgaria	51	
9	Canada ^a		
10	Croatia	19	
11	Cyprus	3	
12	Czech Republic	34	
13	Denmark	32	
14	Estonia	20	
15	Finland	31	
16	France	317	
17	Georgia	2	
18	Germany	121	
19	Greece	55	
20	Hungary	28	
21	Iceland	1	
22	Ireland	14	
23	Italy	151	
24	Kazakhstan	150	
25	Kyrgyzstan	27	
26	Latvia	18	
27	Liechtenstein		
28	Lithuania	14	
29	Luxembourg	3	
30	Malta	1	
31	Monaco		
32	Montenegro	5	
33	Netherlands ^b	25	
34	Norway	51	
35	Poland	125	
36	Portugal	104	
37	Republic of Moldova	10	
38	Romania	154	
39	Russian Federation ^b	763	
40	Serbia	63	
41	Slovakia	19	
42	Slovenia	9	
43	Spain ^b	140	

	<i>Parties</i>	<i>Emission levels 2005 in thousands of tons of PM_{2.5}</i>	<i>Reduction from 2005 level (%)</i>
44	Sweden	29	
45	Switzerland	10	26
46	The former Yugoslav Republic of Macedonia	13	
47	Turkey	268	
48	Ukraine	390	
49	United Kingdom	91	
50	United States ^c	1 706	
51	European Union ^d	1 633	20

^a Upon ratification, acceptance or approval of, or accession to, the present Protocol, Canada shall provide: (a) a value for total estimated PM emission levels for 2005, either national or for its PEMA, if it has submitted one; and (b) an indicative value for a reduction of total emission levels of PM for 2020 from 2005 levels, either at the national level or for its PEMA. Item (a) will be included in the table, and item (b) will be included in a footnote to the table. The PEMA, if submitted, will be included in annex III to the Protocol.

^b Figures apply to the European part of the country.

^c Upon ratification, acceptance or approval of, or accession to the amendment adding this table to the Protocol, the United States shall provide for inclusion in a footnote to the table an indicative value for a reduction of PM_{2.5} emission levels for 2020 from 2005 levels for the appropriate PEMA.

^d Preliminary position of the EU.

O. Annex III

1. For the paragraph underneath the heading "Russian Federation PEMA" in annex III there is substituted:

The Russian Federation PEMA corresponds to the European territory of the Russian Federation. The European territory of the Russian Federation is a part of the territory of Russia within the administrative and geographical boundaries of the entities of the Russian Federation located in Eastern Europe bordering the Asian continent in accordance with the conventional borderline that passes from north to south along the Ural Mountains, the border with Kazakhstan to the Caspian Sea, then along the State borders with Azerbaijan and Georgia in the North Caucasus to the Black Sea.

This PEMA is used solely for the purpose of the present Protocol.

P. Annex IV

For annex IV the following text is substituted:

Limit values for emissions of sulphur from stationary sources

1. Section A applies to Parties other than Canada and the United States of America, section B applies to Canada and section C applies to the United States of America.

A. Parties other than Canada and the United States of America

2. For the purpose of this section “emission limit value” (ELV) means the quantity of SO₂ (or SO_x, where mentioned as such) contained in the waste gases from an installation that is not to be exceeded. Unless otherwise specified, it shall be calculated in terms of mass of SO₂ (SO_x) 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 the waste 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.

3. Compliance with ELVs, minimum desulphurization rates, sulphur recovery rates and sulphur content limit values shall be verified:

(a) Emissions shall be monitored through measurements or through calculations achieving at least the same accuracy. Compliance with ELVs shall be verified through continuous or discontinuous measurements, type approval, or any other technically sound method including verified calculation methods. In case of continuous measurements, compliance with the ELV is achieved if the validated monthly emission average does not exceed the limit value, unless otherwise specified for the individual source category. In case of discontinuous measurements or other appropriate determination or calculation procedures, compliance with the ELV is achieved if the mean value based on an appropriate number of measurements under representative conditions does not exceed the ELV. The inaccuracy of the measurement methods may be taken into account for verification purposes;

(b) In case of combustion plants applying the minimum rates of desulphurization set out in paragraph 5.1 (b), the sulphur content of the fuel shall also be regularly monitored and the competent authorities shall be informed of substantial changes in the type of fuel used. The desulphurization rates shall apply as monthly average values;

(c) Compliance with the minimum sulphur recovery rate shall be verified through regular measurements or any other technically sound method;

(d) Compliance with the sulphur limit values for gas oil shall be verified through regular targeted measurements.

4. Monitoring of relevant polluting substances and measurements of process parameters, as well as the quality assurance of automated measuring systems and the reference measurements to calibrate those systems, shall be carried out in accordance with European Committee for Standardization (CEN) standards. If CEN standards are not available, International Organization for Standardization (ISO) standards, national or international standards which will ensure the provision of data of an equivalent scientific quality shall apply.

5. The following subparagraphs set out special provisions for combustion plants referred to in paragraph 7.

5.1 The competent authority may grant derogation from the obligation to comply with the emission limit values provided for in paragraph 7 in the following cases:

[(a) For a combustion plant which to this end normally uses low-sulphur fuel, in cases where the operator is unable to comply with those limit values because of an interruption in the supply of low-sulphur fuel resulting from a serious shortage;]

[(b) For a combustion plant firing indigenous solid fuel, which cannot comply with the emission limit values provided for in paragraph 7, instead at least the following limit values for the rates of desulphurization have to be met:

- (i) Existing plants: 50–100 MWth: 80%;
- (ii) Existing plants: 100–300 MWth: 90%;
- (iii) Existing plants: > 300 MWth: 95%;
- (iv) New plants: 50–300 MWth: 93%;
- (v) New plants: > 300 MW: 97%;]

[(c) For combustion plants normally using gaseous fuel which 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;]

(d) [For existing combustion plants not operated more than 17,500 operating hours, starting from 1 January 2016 and ending no later than 31 December 2023;]

[For existing combustion plants using solid or liquid fuels not operated more than 1,500 operating hours per year as a rolling average over a period of five years], instead the following ELVs apply:

- (i) For solid fuels: 800 mg/m³;
- (ii) For liquid fuels: 850 mg/m³ for plants with a rated thermal input not exceeding 300 MWth and 400 mg/m³ for plants with a rated thermal input greater than 300 MWth.]

5.2 Where a combustion plant is extended by at least 50 MWth, the ELV specified in paragraph 7 for new installations shall apply to the extensional part affected by the change. The ELV is calculated as an average weighted by the *actual* thermal input for both the existing and the new part of the plant.

5.3 Parties shall ensure that provisions are made in the permits for procedures relating to malfunction or breakdown of the abatement equipment.

5.4 In the case of a multi-fuel firing combustion plant involving the simultaneous use of two or more fuels, the competent authority shall determine the ELV as the weighted average of the ELVs for the individual fuels, on the basis of the thermal input delivered by each fuel.

6. Parties may apply rules by which combustion plants and process plants within a mineral oil refinery may be exempted from compliance with the individual SO₂ limit values set out in this annex, provided that they are complying with a bubble SO₂ limit value determined on the basis of the best available techniques.

7. Combustion plants with a rated thermal input exceeding 50 MWth:¹⁰

Table 1
Limit values for SO₂ emissions from combustion plants^{a/}

Fuel type	Thermal input [(MWth)]	ELV for SO ₂ mg/m ³ ^{b/}	
		Option 2	Option 3
Solid fuels	50–100	New plants: 400 (coal, lignite and other solid fuels) 300 (peat)	New plants: 200 (biomass)
		Existing plants: 400 (coal, lignite and other solid fuels) 300 (peat) 200 (biomass)	[Existing plants: 2000 (coal, lignite) 2000 (peat) 2000 biomass) – delete]
	100–300	New plants: 200 (coal, lignite and other solid fuels) 300 (peat)	New plants: 200 (biomass)
		Existing plants: 250 (coal, lignite and other solid fuels) 300 (peat) 200 (biomass)	[Existing plants: 2000 (coal, lignite) 2000 (peat) 2000 (biomass) – delete]
	>300	New plants: 150 (coal, lignite and other solid fuels) (FBC: 200) 150 (peat) (FBC: 200) 150 (biomass)	
		Existing plants: 200 (coal, lignite and other solid fuels) 200 (peat) 200 (biomass)	[Existing plants: 1200 (coal, lignite) 1200 (peat) 1200 (biomass) – delete]

¹⁰ The rated thermal input of the combustion plant is calculated as the sum of the input of all units connected to a common stack. Individual units below 15 MWth shall not be considered when calculating the total rated thermal input.

Fuel type	Thermal input [(MWth)]	ELV for SO ₂ mg/m ³ ^{b/}	
		Option 2	Option 3
Liquid fuels	50–100	New plants: 350 Existing plants: 350	[Existing plants: 1700 – delete]
	100–300	New plants: 200 Existing plants: 250	[Existing plants: 1700 – delete]
	>300	New plants: 150 Existing plants: 200	New plants: 200 Existing plants: 1,700
Gaseous fuels in general	>50		New plants: 35 Existing plants: 35
Liquefied gas	>50	New plants: 5 Existing plants: 5	
Coke oven gas or blast furnace gas	>50	New plants: 200 for blast furnace gas 400 for coke oven gas Existing plants: 200 for blast furnace gas 400 for coke oven gas	
Gasified refinery residues	> 50	New plants: 35	Existing plants: 800

Note: FBC = fluidized bed combustion (circulating, pressurized, bubbling).

^{a/} In particular, the ELVs shall not apply to:

- Plants in which the products of combustion are used for direct heating, drying, or any other treatment of objects or materials;
- Post-combustion plants designed to purify the waste gases by combustion which are not operated as independent combustion plants;
- Facilities for the regeneration of catalytic cracking catalysts;
- Facilities for the conversion of hydrogen sulphide into sulphur;
- Reactors used in the chemical industry;
- Coke battery furnaces;
- Cowpers;
- [Recovery boilers within installations for the production of pulp;]
- Waste incinerators; and
- Plants powered by diesel, petrol or gas engines or by combustion turbines, irrespective of the fuel used.

^{b/} The O₂ reference content is 6% for solid fuels and 3% for liquid and gaseous fuels.

8. Gas oil:

Table 2
Limit values for the sulphur content of gas oil^{a/}

<i>Sulphur content (per cent by weight)</i>	
Gas oil	< 0.10

^{a/} “Gas oil” means any petroleum-derived liquid fuel, excluding marine fuel, falling within CN code 2710 19 25, 2710 19 29, 2710 19 45 or 2710 19 49, or any petroleum-derived liquid fuel, excluding marine fuel, of which less than 65% by volume (including losses) distils at 250° C and of which at least 85% by volume (including losses) distils at 350° C by the ASTM D86 method. Diesel fuels, i.e., gas oils falling within CN code 2710 19 41 and used for self-propelling vehicles, are excluded from this definition. Fuels used in non-road mobile machinery and agricultural tractors are also excluded from this definition.

9. Mineral oil and gas refineries:

Sulphur recovery units: for plants that produce more than 50 Mg of sulphur a day:

Table 3
Limit value expressed as a minimum sulphur recovery rate of sulphur recovery units

<i>Plant type</i>	<i>Minimum sulphur recovery rate^{a/} (%)</i>	
	<i>Option 2</i>	<i>Option 3</i>
New plant		99.5
Existing plant	98.5	[97 – delete]

^{a/} The sulphur recovery rate is the percentage of the imported H₂S converted to elemental sulphur as a yearly average.

10. Titanium dioxide production:

Table 4
Limit values for SO_x emissions released from titanium dioxide production (annual average)

<i>Plant type</i>	<i>ELV for SO_x (expressed as SO₂) [(kg/t of TiO₂)]</i>
	<i>Option 2</i>
Sulphate process, total emission	6
Chloride process, total emission	1.7

B. Canada

11. Limit values for controlling emissions of sulphur oxides will be determined for stationary sources, as appropriate, taking into account information on available control technologies, limit values applied in other jurisdictions, and the documents below:

- (a) Order Adding Toxic Substances to Schedule 1 to the Canadian Environmental Act, 1999. SOR/2011-34;
- (b) Proposed Regulation, Order Adding Toxic Substances to Schedule 1 to the Canadian Environmental Protection Act, 1999;
- (c) New Source Emission Guidelines for Thermal Electricity Generation;
- (d) National Emission Guidelines for Stationary Combustion Turbines. PN1072; and
- (e) Operating and Emission Guidelines for Municipal Solid Waste Incinerators. PN1085.

C. United States of America

12. Limit values for controlling emissions of sulphur dioxide from new stationary sources in the following stationary source categories are specified in the following documents:

- (a) Electric Utility Steam Generating Units — 40 Code of Federal Regulations (C.F.R.) Part 60, Subpart D, and Subpart Da;
- (b) Industrial-Commercial-Institutional Steam Generating Units — 40 C.F.R. Part 60, Subpart Db, and Subpart Dc;
- (c) Sulphuric Acid Plants — 40 C.F.R. Part 60, Subpart H;
- (d) Petroleum Refineries — 40 C.F.R. Part 60, Subpart J and Subpart Ja;
- (e) Primary Copper Smelters — 40 C.F.R. Part 60, Subpart P;
- (f) Primary Zinc Smelters — 40 C.F.R. Part 60, Subpart Q;
- (g) Primary Lead Smelters — 40 C.F.R. Part 60, Subpart R;
- (h) Stationary Gas Turbines — 40 C.F.R. Part 60, Subpart GG;
- (i) Onshore Natural Gas Processing — 40 C.F.R. Part 60, Subpart LLL;
- (j) Municipal Waste Combustors — 40 C.F.R. Part 60, Subpart Ea, and Subpart Eb;
- (k) Hospital/Medical/Infectious Waste Incinerators — 40 C.F.R. Part 60, Subpart Ec;
- (l) Stationary Combustion Turbines — 40 C.F.R. Part 60, Subpart KKKK;
- (m) Small Municipal Waste Combustors — 40 C.F.R. Part 60, Subpart AAAA;
- (n) Commercial and Industrial Solid Waste Combustors — 40 C.F.R. Part 60, Subpart CCCC; and
- (o) Other Solid Waste Combustors — 40 C.F.R. Part 60, Subpart EEEE.

Q. Annex V

For annex V the following text is substituted:

Limit values for emissions of nitrogen oxides from stationary sources

1. Section A applies to Parties other than Canada and the United States of America, section B applies to Canada and section C applies to the United States of America.

A. Parties other than Canada and the United States of America

2. For the purpose of this section “emission limit value” (ELV) means the quantity of NO_x (sum of NO and NO₂, expressed as NO₂) contained in the waste gases from an installation that is not to be exceeded. Unless otherwise specified, it shall be calculated in terms of mass of NO_x 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 the waste 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.

3. Emissions shall be monitored in all cases via measurements of NO_x or through calculations or a combination of both achieving at least the same accuracy. Compliance with ELVs shall be verified through continuous or discontinuous measurements, type approval, or any other technically sound method including verified calculation methods. In case of continuous measurements, compliance with the ELVs is achieved if the validated monthly emission average does not exceed the limit values. In case of discontinuous measurements or other appropriate determination or calculation procedures, compliance with the ELVs is achieved if the mean value based on an appropriate number of measurements under representative conditions does not exceed the ELV. The inaccuracy of the measurement methods may be taken into account for verification purposes.

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

5. Special provisions for combustion plants referred to in paragraph 6:

5.1 The competent authority may grant derogation from the obligation to comply with the ELVs provided for in paragraph 6 in the following cases:

(a) For combustion plants normally using gaseous fuel which 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;

[(b) For existing combustion plants not operated more than 17,500 operating hours, starting from 1 January 2016 and ending no later than 31 December 2023 or

For existing combustion plants other than onshore gas turbines (covered by paragraph 7) using solid or liquid fuels not operated more than 1,500 operating hours per year as a rolling average over a period of five years, instead the following ELVs apply:

- (i) For solid fuels: 450 mg/m³;
- (ii) For liquid fuels: 450 mg/m³.]

5.2 Where a combustion plant is extended by at least 50 MWth, the ELV specified in paragraph 6 for new installations shall apply to the extensional part affected by the change. The ELV is calculated as an average weighted by the *actual* thermal input for both the existing and the new part of the plant.

5.3 Parties shall ensure that provisions are made in the permits for procedures relating to malfunction or breakdown of the abatement equipment.

5.4 In the case of a multi-fuel firing combustion plant involving the simultaneous use of two or more fuels, the competent authority shall determine the ELV as the weighted average of the ELVs for the individual fuels, on the basis of the thermal input delivered by each fuel. Parties may apply rules by which combustion plants and process plants within a mineral oil refinery may be exempted from compliance with the individual NO_x limit values set out in this annex, provided that they are complying with a bubble NO_x limit value determined on the basis of the best available techniques.

6. Combustion plants with a rated thermal input exceeding 50 MWth:¹¹

Table 1

Limit values for NO_x emissions released from combustion plants^{a/}

Fuel type	Thermal input [MWth]	ELV for NO _x (mg/m ³) ^{b/}	
		Option 2	Option 3
Solid fuels	50–100	New plants: 300 (coal, lignite and other solid fuels) (pulverized lignite: 450) 250 (biomass, peat)	
		Existing plants: 300 (coal, lignite and other solid fuels) (pulverized lignite: 450) 250 (biomass, peat)	[Existing plants: 600 (coal, lignite) 600 (biomass, peat – delete]

¹¹ The rated thermal input of the combustion plant is calculated as the sum of the input of all units connected to a common stack. Individual units below 15 MWth shall not be considered when calculating the total rated input.

<i>Fuel type</i>	<i>Thermal input [MWth]</i>	<i>ELV for NO_x (mg/m³)^{b/}</i>	
		<i>Option 2</i>	<i>Option 3</i>
Liquid fuels	100–300	New plants: 200 (coal, lignite and other solid fuels) 200 (biomass, peat) Existing plants: 200 (coal, lignite and other solid fuels) 250 (biomass, peat)	[Existing plants: 600 (coal, lignite) 600 (biomass, peat – delete)]
	>300	New plants: 150 (coal, lignite and other solid fuels) (general) 150 (biomass, peat) Existing plants: 200 (coal, lignite and other solid fuels) 200 (biomass, peat)	New plants: 200 (pulverized lignite)
	50–100	New plants: 300 Existing plants: 450	
	100–300	New plants: 150 Existing plants: 200 (general)	Existing plants within refineries and chemical installations: 450 for firing of distillation and conversion residues from crude oil refining for own consumption in combustion plants and for firing liquid production residue as non-commercial fuel
	>300	New plants: 100 Existing plants: 150 (general) Existing plants within refineries and chemical installations: 450 for firing of distillation and conversion residues from crude oil refining for own consumption in combustion plants and for firing liquid production residue as non-commercial fuel (< 500 MWth)	[Existing plants: 400 – delete]

Fuel type	Thermal input [(MWth)]	ELV for NO _x (mg/m ³) ^{b/}	
		Option 2	Option 3
Natural gas	50–300	New plants: 100 Existing plants: 100	
	>300	New plants: 100 Existing plants: 100	
Other gaseous fuels	>50	New plants: 200 Existing plants: 300	

^{a/} In particular, the ELVs shall not apply to:

- Plants in which the products of combustion are used for direct heating, drying, or any other treatment of objects or materials;
- Post-combustion plants designed to purify the waste gases by combustion which are not operated as independent combustion plants;
- Facilities for the regeneration of catalytic cracking catalysts;
- Facilities for the conversion of hydrogen sulphide into sulphur;
- Reactors used in the chemical industry;
- Coke battery furnaces;
- Cowpers;
- [Recovery boilers within installations for the production of pulp;]
- Waste incinerators; and
- Plants powered by diesel, petrol or gas engines or by combustion turbines, irrespective of the fuel used.

^{b/} The O₂ reference content is 6% for solid fuels and 3% for liquid and gaseous fuels.

7. Onshore combustion turbines with a rated thermal input exceeding 50 MWth: the NO_x ELVs expressed in mg/Nm³ (at a reference O₂ content of 15%) are to be applied to a single turbine. The ELVs in table 2 apply only above 70% load.

Table 2

Limit values for NO_x emissions released from onshore combustion turbines (including Combined Cycle Gas turbines (CCGT))

Fuel type	Thermal input [(MWth)]	ELV for NO _x (mg/m ³) ^{a/}	
		Option 1	Option 2
Liquid fuels (light and medium distillates)	> 50	New plants: 50	
		Existing plants: 90 200 in case of plants operating less than 1,500 hours a year	[Existing plants: 120- delete]

Fuel type	Thermal input [(MWh)]	ELV for NO _x (mg/m ³) ^{a/}	
		Option 1	Option 2
Natural gas ^{b/}	> 50	Existing plants: 50 (general) ^{c/, d/} 150 in case of plants operating less than 1,500 hours per year	New plants: 50 (in general) ^{d/}
Other gases	> 50		New plants: 50 Existing plants: 120 200 in case of plants operating less than 1,500 hours a year

^{a/} Gas turbines for emergency use that operate less than 500 hours per year are not covered.

^{b/} Natural gas is naturally occurring methane with not more than 20% (by volume) of inert gases and other constituents.

^{c/} 75 mg/Nm³ in the following cases, where the efficiency of the gas turbine is determined at ISO base load conditions:

- (i) Gas turbines, used in combined heat and power systems having an overall efficiency greater than 75%;
- (ii) Gas turbines used in combined cycle plants having an annual average overall electrical efficiency greater than 55%;
- (iii) Gas turbines for mechanical drives.

^{d/} For single gas turbines not falling into any of the categories mentioned under footnote c/, but having an efficiency greater than 35% — determined at ISO base load conditions — the ELV for NO_x shall be $50 \times \eta / 35$ where η is the gas-turbine efficiency at ISO base load conditions expressed as a percentage.

8. Cement production:

Table 3
Limit values for NO_x emissions released from cement clinker production^{a/}

Plant type	ELV for NO _x [(mg/Nm ³)]	
	Option 2	Option 3
General (existing and new installations)		500
Existing lepol and long rotary kilns in which no waste is co-incinerated	800	

^{a/} Installations for the production of cement clinker in rotary kilns with a capacity >500 Mg/day or in other furnaces with a capacity >50 Mg/day. The O₂ reference content is 10%.

9. Stationary engines:

Table 4

Limit values for NO_x emissions released from new stationary engines

<i>Engine type, power, fuel specification</i>	<i>ELV 1^{a/, b/, c/} [(mg/Nm³)]</i>	<i>ELV 2^{a/, b/, c/} [(mg/Nm³)]</i>	<i>ELV 3^{a/} [(mg/Nm³)]</i>
Gas engines > 1 MWth			
Spark ignited (=Otto) engines all gaseous fuels		95 (enhanced lean burn)	190 Standard lean burn or rich burn [with catalyst]
Dual fuel engines > 1 MWth			
In gas mode (all gaseous fuels)		190	
In liquid mode (all liquid fuels)			
1–20 MWth	225		
>20 MWth	225 ^{c/}		
Diesel engines > 5 MWth (compression ignition)			
<i>Slow (< 300 rpm)/ Medium (300- 1,200 rpm)/ speed</i>			
5–20 MWth			
Heavy Fuel Oil (HFO) and bio-oils	225		
Light Fuel Oil (LFO) and Natural Gas (NG)		190	
>20 MWth			
HFO and bio-oils	190		
LFO and NG		190	
<i>High speed (>1,200 rpm)</i>		190	

Note: The reference oxygen content is 15%.¹²

^{a/} These ELVs do not apply to engines running less than 500 hours a year.

^{b/} Where SCR cannot currently be applied for technical and logistical reasons [like on remote islands] or where the availability of sufficient amounts of high quality fuel cannot be guaranteed, a transition period of 10 years after the entry into force of the Protocol may be for diesel engines and dual fuel engines during which the following ELVs apply:

¹² The conversion factor from the limit values in the current Protocol (at 5% oxygen content) is 2,66 (16/6).

Thus, the limit value of:

- 190 mgNm³ at 15 % O₂ corresponds to 500 mg/Nm³ at 5 % O₂,
- 95 mg/Nm³ at 15 % O₂ corresponds to 250 mg/Nm³ at 5 % O₂,
- 225 mg/Nm³ at 15 % O₂ corresponds to 600 mg/Nm³ at 5 % O₂.

- (i) Dual fuel engines: 1,850 mg/Nm³ in liquid mode; 380 mg/Nm³ in gas mode;
- (ii) Diesel engines — Slow (< 300 rpm) and Medium (300–1,200 rpm)/speed:
1,300 mg/Nm³ for engines between 5 and 20 MWth and 1,850 mg/Nm³ for engines
> 20 MWth;
- (iii) Diesel engines — High speed (> 1200 rpm): 750 mg/Nm³.

^{c/} Engines running between 500 and 1,500 operational hours per year may be exempted from compliance with these ELVs in case they are applying [is to apply [the upper values of ELV3] primary measures to limit NO_x emissions and meet the ELVs set out in footnote b/];

[^{e/} A derogation from the obligation to comply with the emission limit values can be granted to combustion plants using gaseous fuel which 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. The exception time period shall not exceed 10 days except where there it is an overriding need to maintain energy supplies. – ~~delete~~]

[[Since engines running with higher energy efficiency consume less fuel and emit therefore less CO₂ and since higher efficiency of the engines can lead to higher temperatures and therefore to higher NO_x concentrations in the flue gases, a NO_x bonus using the formula [ELV x actual efficiency / reference efficiency] could be justified .] – ~~delete~~]

10. Iron ore sinter plants:

Table 5

Limit values for NO_x emissions released from iron ore sinter plants

<i>Plant type</i>	<i>ELV for NO_x [(mg/Nm³)]</i>
	<i>Option 2</i>
Sinter plants: New installation	400
Sinter plants: Existing installation	400

[^{a/} Production and processing of metals: metal ore roasting or sintering installations, installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting with a capacity exceeding 2.5 Mg/hour, installations for the processing of ferrous metals (hot rolling mills > 20 Mg/hour of crude steel).

^{b/} As an exemption to paragraph 3, these ELVs should be considered as averaged over a substantial period of time.]

11. Nitric acid production:

Table 6

Limit values for NO_x emissions from nitric acid production excluding acid concentration units

<i>Type of installations</i>	<i>ELV for NO_x [(mg/Nm³)]</i>
	<i>Option 2</i>
New installations	160
Existing installations	190

B. Canada

12. Limit values for controlling emissions of NO_x will be determined for stationary sources, as appropriate, taking into account information on available

control technologies, limit values applied in other jurisdictions, and the documents below:

- (a) New Source Emission Guidelines for Thermal Electricity Generation;
- (b) National Emission Guidelines for Stationary Combustion Turbines. PN1072;
- (c) National Emission Guidelines for Cement Kilns. PN1284;
- (d) National Emission Guidelines for Industrial/Commercial Boilers and Heaters. PN1286;
- (e) Operating and Emission Guidelines for Municipal Solid Waste Incinerators. PN1085;
- (f) Management Plan for Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOCs) — Phase I. PN1066; and
- (g) Operating and Emission Guidelines for Municipal Solid Waste Incinerators. PN1085.

C. United States of America

13. Limit values for controlling emissions of NO_x from new stationary sources in the following stationary source categories are specified in the following documents:

- (a) Coal-fired Utility Units — 40 Code of Federal Regulations (C.F.R.) Part 76;
- (b) Electric Utility Steam Generating Units — 40 C.F.R. Part 60, Subpart D, and Subpart Da;
- (c) Industrial-Commercial-Institutional Steam Generating Units — 40 C.F.R. Part 60, Subpart Db;
- (d) Nitric Acid Plants — 40 C.F.R. Part 60, Subpart G;
- (e) Stationary Gas Turbines — 40 C.F.R. Part 60, Subpart GG;
- (f) Municipal Waste Combustors — 40 C.F.R. Part 60, Subpart Ea, and Subpart Eb;
- (g) Hospital/Medical/Infectious Waste Incinerators — 40 C.F.R. Part 60, Subpart Ec;
- (h) Petroleum Refineries — 40 C.F.R. Part 60, Subpart J, and Subpart Ja;
- (i) Stationary Internal Combustion Engines — Spark Ignition, 40 C.F.R. Part 60, Subpart JJJ;
- (j) Stationary Internal Combustion Engines — Compression Ignition, 40 C.F.R. Part 60, Subpart IIII;
- (k) Stationary Combustion Turbines — 40 C.F.R. Part 60, Subpart KKKK;
- (l) Small Municipal Waste Combustors — 40 C.F.R. Part 60, Subpart AAAA;
- (m) Portland Cement — 40 C.F.R. Part 60, Subpart F;

- (n) Commercial and Industrial Solid Waste Combustors — 40 C.F.R. Part 60, Subpart CCCC; and
- (o) Other Solid Waste Combustors — 40 C.F.R. Part 60, Subpart EEEE.

R. Annex VI

1. In annex VI, paragraph 2:
 - (a) The words “non-methane volatile organic compound (NMVOC)” are replaced by the word “VOC”; and
 - (b) The words “8 to 21” are replaced by the words “8 to 22”.
2. In paragraph 3:
 - (a) The words “the following source categories are defined” are inserted at the end of the chapeau;
 - (b) In subparagraph 3 (a):
 - (i) The word “excluding” is replaced by the word “including”; and
 - (ii) The words “covered by relevant documents on mobile sources” are deleted;
 - (c) In subparagraph 3 (b), the words “process” and “processes” are replaced by the word “activity”;
 - (d) In subparagraph 3 (c), the word “process” is replaced by the word “activity”;
 - (e) For the chapeau to subparagraph 3 (d) there is substituted:
 - (d) “Coating activity” means any activity in which a single or multiple application of a continuous film of coating is laid onto:
 - (f) In subparagraph 3 (d) (i), the words “(see below)” are deleted;
 - (g) In subparagraph 3 (d) (v):
 - (i) The comma after the word “etc.” is replaced by a semicolon; and
 - (ii) The words “wooden surfaces, textile, fabric, film and paper surfaces.” are deleted.
 - (h) New subparagraphs to 3 (d) are added as follows:
 - (vi) Wooden surfaces;
 - (vii) Textile, fabric, film and paper surfaces; and
 - (viii) Leather.
 - (i) In the final paragraph under subparagraph 3 (d):
 - (i) All instances of the words “process” and “processes” are replaced by the word “activity”, except in the third sentence where “processes” is replaced with “activities”; and
 - (ii) The word “included” is replaced by the words “covered by this definition”;
 - (j) In subparagraph 3 (e), the word “processes” is replaced by the word “activity”;
 - (k) In subparagraph 3 (f), the word “process” is replaced by the word “activity”;

- (l) In subparagraph 3 (h):
 - (i) The word “process” is replaced by the word “activity”; and
 - (ii) The word “sub-processes” is replaced by the word “sub-activities”;
 - (m) In subparagraph 3 (h) (i), the word “process” is replaced by the word “activity”;
 - (n) In subparagraph 3 (h) (ii), the word “process” is replaced by the word “activity”;
 - (o) In subparagraph 3 (h) (iv), the word “process” is replaced by the word “activity”;
 - (p) In subparagraph 3 (h) (vi), the word “process” is replaced by the word “activity”;
 - (q) In subparagraph 3 (h) (vii), the words “a process” are replaced by the words “an activity”;
 - (r) In subparagraph 3 (j), the word “process” is replaced by the word “activity” and the word “processes” is replaced by the word “activities”;
 - (s) In subparagraph 3 (k):
 - (i) Both instances of the word “process” in the first sentence are replaced by the word “activity”; and
 - (ii) The first instance of the word “process” in the second sentence is replaced by the word “activity”;
 - (t) In subparagraph 3 (m):
 - (i) For subparagraph (m) (i) there is substituted:
 - (i) The original coating of road vehicles, or part of them, with refinishing-type materials, where this is carried out away from the original manufacturing line, or the coating of trailers (including semi-trailers);
 - (ii) For subparagraph (m) (ii) there is substituted:
 - (ii) Vehicle refinishing, defined as the coating of road vehicles, or part of them, carried out as part of vehicle repair, conservation or decoration outside manufacturing installations, is not covered by this annex. The products used as part of this activity are considered in annex XI;
 - (iii) Subparagraph (m) (iii) is deleted;
 - (u) For subparagraph 3 (n) there is substituted:
 - (n) “Wood impregnation” means any activity giving a loading of preservative in timber;
 - (v) For subparagraph 3 (p) there is substituted:
 - (p) “Organic compound” means any compound containing at least the element carbon and one or more of hydrogen, halogens, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates;
 - (w) New subparagraphs are inserted after subparagraph 3 (p) as follows:

(p bis) “Volatile organic compound” (VOC) means any organic compound as well as the fraction of creosote, having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use;

(p ter) “Organic solvent” means any VOC which is used alone or in combination with other agents, and without undergoing a chemical change, to dissolve raw material, products or waste materials, or is used as a cleaning agent to dissolve contaminants, or as a dissolver, or as a dispersion medium, or as a viscosity adjuster, or as a surface tension adjuster, or a plasticizer, or as a preservative;

(x) In subparagraph 3 (q), the word “gas” is replaced by the word “gases”;

(y) A new subparagraph is inserted after subparagraph 3 (q) as follows:

(q bis) “Winding wire coating” means any coating activity of metallic conductors used for winding the coils in transformers and motors, etc;

(z) In subparagraph 3 (r):

(i) The words “of NMVOCs” are deleted after the words “Fugitive emission”;

(ii) The word “NMVOC” before the words “into air” is replaced by the word “VOC”;

(iii) A semicolon is inserted after the word “product”;

(iv) The word “and” after the word “product” is replaced by the word “this”;

(v) The word “NMVOCs” before the word “released” is replaced by the word “VOCs”; and

(vi) The words “limit values are” are replaced by the words “emissions may be”;

(aa) In subparagraph 3 (s), all instances of the word “NMVOCs” are replaced by the word “VOCs”;

(bb) In subparagraph 3 (u):

(i) The words ““Limit value”” are replaced by the words ““Emission limit value” (ELV)”;

(ii) The words “a gaseous substance contained in the waste gases” are replaced by the words “VOC, except methane, emitted”;

(iii) The words “Unless otherwise specified, it shall be calculated in terms of mass of pollutant” are replaced by the words “For waste gases, it is expressed in terms of mass of VOC”;

(iv) The words “For solvent-using installations, limit values are given as mass unit per characteristic unit of the respective activity” are deleted;

(v) The word “gas” at the end of the penultimate sentence is replaced by the word “gases”;

(vi) The words “Limit values generally address all volatile organic compounds except methane (no further distinction is made, e.g. in terms of reactivity or toxicity)” are deleted;

(vii) The words “Emission limit values for waste gases are indicated as ELVc; emission limit values for fugitive emissions are indicated as ELVf.” are added at the end of the subparagraph;

(cc) The following new subparagraphs are added at the end of paragraph 3:

(x) “Footwear manufacture” means any activity of producing complete footwear or part of it;

(y) “Solvent consumption” means the total input of organic solvents into an installation per calendar year, or any other 12-month period, less any VOCs that are recovered for reuse.

3. For paragraphs 4 to 23 there is substituted:

4. The following requirements shall be satisfied:

(a) Emissions shall be monitored in all cases via measurements or through calculations¹³ achieving at least the same accuracy. Compliance with ELVs shall be verified through continuous or discontinuous measurements, type approval, or any other technically sound method. For the emissions in waste gases, in case of continuous measurements, compliance with the ELVs is achieved if the validated daily emission average does not exceed the ELVs. In case of discontinuous measurements or other appropriate determination procedures, compliance with the ELVs is achieved if the average of all the readings or other procedures within one monitoring exercise does not exceed the limit values. The inaccuracy of the measurement methods may be taken into account for verification purposes. The fugitive and total ELVs apply as annual averages;

(b) The concentrations of air pollutants in gas-carrying ducts shall be measured in a representative way. Monitoring of relevant polluting substances and measurements of process parameters, as well as the quality assurance of automated systems and the reference measurements 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.

5. The following ELVs apply for waste gases containing substances harmful to human health:

(a) 20 mg/Nm³ (expressed as the mass sum of individual compounds) for discharges of halogenated VOCs, [volatile organic compounds] which are assigned the following risk phrases: “suspected of causing cancer” and/or “suspected of causing genetic defects”, where the mass flow of the sum of the considered compounds is greater than or equal to 100 g/h; and

(b) 2 mg/Nm³ (expressed as the mass sum of individual compounds) for discharges of VOCs, [volatile organic compounds] which are assigned the following risk phrases: “may cause cancer”, “may cause genetic defects”, “may cause cancer by inhalation”, “may damage fertility”, “may damage the unborn child”, where the mass flow of the sum of the considered compounds is greater than or equal to 10 g/h.

6. For the source categories listed in paragraphs 9 to 22 where it is demonstrated to the satisfaction of the competent authority that for an individual installation compliance with the fugitive emission limit value (ELVf) is not technically and economically feasible, the competent authority may exempt that installation provided that significant risks to human health or the environment are

¹³ Belarus has suggested that greater clarity should be provided concerning calculation methods either within the body of the Protocol itself, i.e., in a separate part of the annex, or in a guidance document.

not expected and that the operator demonstrates to the satisfaction of the competent authority that the best available techniques are used.

7. The limit values for VOC emissions for the source categories defined in paragraph 3 shall be as specified in paragraphs 8 to 22 below.

8. Storage and distribution of petrol:

(a) Petrol storage installations at terminals, when above the threshold values mentioned in table 1, must be either:

(i) Fixed-roof tanks, which are connected to a vapour recovery unit meeting the ELVs set out in table 1 or;

(ii) Designed with a floating roof, either external or internal, equipped with primary and secondary seals meeting the reduction efficiency set out in table 1;

(b) As a derogation from the above-mentioned requirements, fixed-roof tanks, which were in operation prior to 1 January 1996 and which are not connected to a vapour recovery unit, must be equipped with a primary seal which is achieving a reduction efficiency of 90%.

Table 1

Limit values for VOC emissions from the storage and distribution of petrol, excluding the loading of seagoing ships (stage I)

<i>Activity</i>	<i>Threshold value</i>	<i>Option 3</i>
		<i>ELV or reduction efficiency</i>
Loading and unloading of mobile container at terminals	5,000 m ³ petrol throughput annually	10g VOC/Nm ³ including methane ^{a/}
Storage installations at terminals	Existing terminals or tank farms with a petrol throughput of 10,000 Mg/year or more New terminals (without thresholds except for terminals located in small remote islands with a throughput less than 5,000 Mg/year)	95% ^{b/}
Service stations	Petrol throughput larger than 100 m ³ /year	0.01% w/w of the throughput ^{c/}

^{a/} The vapour displaced by the filling of petrol storage tanks shall be displaced either into other storage tanks or into abatement equipment meeting the limit values in the table above.

^{b/} Reduction efficiency expressed in % compared to a comparable fixed-roof tank with no vapour-containment controls, i.e., with only a vacuum/pressure relief valve.

^{c/} Vapours displaced by the delivery of petrol into storage installations at service stations and in fixed-roof tanks used for the intermediate storage of vapours must be returned through a vapour-tight connection line to the mobile container delivering the petrol. Loading operations may not take place unless the arrangements are in place and properly functioning. Under these conditions, no additional monitoring of the compliance with the limit value is required.

Table 1 bis
Limit values for VOC emissions for car refuelling at service station (stage II)

<i>Threshold values</i>	<i>Minimum vapour capture efficiency % w/w^{a/}</i>
New service station if its actual or intended throughput is greater than 500 m ³ per annum	
Existing service station if its actual or intended throughput is greater than 3,000 m ³ per annum as of 2019	
Existing service station if its actual or intended throughput is greater than 500 m ³ per annum and which undergoes a major refurbishment	

^{a/} The capture efficiency of the systems has to be certified by the manufacturer in accordance with relevant technical standards or type approval procedures.

9. Adhesive coating:

Table 2
Limit values for adhesive coating

<i>Activity and threshold</i>	<i>ELV for VOC</i> <i>[(daily for ELVc and yearly for ELVf and total ELV)]</i>	
	<i>Option 2</i>	<i>Option 3</i>
Footwear Manufacture (solvent consumption > 5 Mg/year)		25 ^{a/} g VOC / pair of shoes
Other adhesive coating (solvent consumption 5–15 Mg/year)		ELVc = 50 mg ^{b/} C/Nm ³ ELVf = 25 wt-% or less of the solvent input <i>Or</i> total ELV of 1.2 kg or less of VOC/kg of solid input
Other adhesive coating (solvent consumption 15–200 Mg/year)		ELVc = 50 mg ^{b/} C/Nm ³ ELVf = 20 wt-% or less of the solvent input <i>Or</i> total ELV of 1 kg or less of VOC/kg of solid input
Other adhesive coating (solvent consumption > 200 Mg/year)	ELVc = 50 mg ^{c/} C/Nm ³ ELVf = 15 wt-% or less of the solvent input <i>Or</i> total ELV of 0.8 kg or less of VOC/kg of solid input	

^{a/} Total ELVs are expressed in grams of solvent emitted per pair of complete footwear produced.

^{b/} If techniques are used which allow reuse of recovered solvent, the limit value shall be 150 mg C/Nm³.

^{c/} If techniques are used which allow reuse of recovered solvent, the limit value shall be 100 mg C/Nm³.

10. Wood and plastic lamination:

Table 3
Limit values for wood and plastic lamination

Activity and threshold	ELV for VOC [(yearly)]	
	Options 1, 2 and 3	
Wood and plastic laminating (solvent consumption > 5 Mg/year)	Total ELV of 30 g VOC/m ² of final product	

11. Coating activities (vehicle coating industry):

Table 4
Limit values for coating activities in the vehicle industry

Activity and threshold	ELV for VOC [(yearly for total ELV)]	
	Option 2 ^{a/}	Option 3 ^{a/}
Manufacture of cars (M1, M2) (solvent consumption > 15 Mg/year and ≤ 5,000 coated items a year or > 3,500 chassis built)		90 g VOC/m ² or 1.5 kg/ body + 70 g/m ²
Manufacture of cars (M1, M2) (solvent consumption 15–200 Mg/year and > 5,000 coated items a year)		<i>Existing installations:</i> 60g VOC/m ² or 1.9 kg/ body + 41 g/m ² <i>New installations:</i> 45 g VOC/m ² or 1.3 kg/body + 33 g/m ²
Manufacture of cars (M1, M2) (solvent consumption > 200 Mg/year and > 5,000 coated items a year)	35 g VOC/m ² or 1 kg/body + 26 g/m ² ^{b/}	[<i>Existing installations:</i> 60g VOC/m ² or 1.9 kg/ body + 41 g/m ² - <u>delete</u>]
Manufacture of truck cabins (N1, N2, N3) (solvent consumption > 15 Mg/year and ≤ 5,000 coated items/year)		<i>Existing installations:</i> 85 g VOC/m ² <i>New installations:</i> 65 g VOC/m ²
Manufacture of truck cabins (N1, N2, N3) (solvent consumption 15–200 Mg/year and > 5,000 coated items a year)		<i>Existing installations:</i> 75 g VOC/m ² <i>New installations:</i> 55 g VOC/m ²
Manufacture of truck cabins (N1, N2, N3) (solvent consumption > 200 Mg/year and > 5,000 coated items a year)	55 g VOC/m ²	[<i>Existing installations:</i> 75 g VOC/m ² - <u>delete</u>]
Manufacture of trucks and vans (solvent consumption > 15 Mg/year)		<i>Existing installations:</i> 120 g VOC/m ²

<i>Activity and threshold</i>	<i>ELV for VOC [(yearly for total ELV)]</i>	
	<i>Option 2 ^{a/}</i>	<i>Option 3 ^{a/}</i>
Mg/year and ≤ 2,500 coated items a year)		<i>New installations: 90 g VOC/m²</i>
Manufacture of trucks and vans (solvent consumption 15–200 Mg/year and > 2,500 coated items a year)		<i>Existing installations: 90 g VOC/m²</i> <i>New installations: 70 g VOC/m²</i>
Manufacture of trucks and vans (solvent consumption > 200 Mg/year and > 2,500 coated items a year)	50 g VOC/m ²	[<i>Existing installations: 90 g VOC/m² - <u>delete</u></i>]
Manufacture of buses (solvent consumption > 15 Mg/year and ≤ 2,000 coated items a year)		<i>Existing installations: 290 g VOC/m²</i> <i>New installations: 210 g VOC/m²</i>
Manufacture of buses (solvent consumption 15–200 Mg/year and > 2,000 coated items a year)		<i>Existing installations: 225 g VOC/m²</i> <i>New installations: 150 g VOC/m²</i>
Manufacture of buses (solvent consumption > 200 Mg/year and > 2,000 coated items a year)	150 g VOC/m ²	[<i>Existing installations: 225 g VOC/m² - <u>delete</u></i>]

^{a/} The total limit values are expressed in terms of mass of organic solvent (g) emitted in relation to the surface area of product (m²). The surface area of the product is defined as the surface area calculated from the total electrophoretic coating area and the surface area of any parts that might be added in successive phases of the coating process which are coated with the same coatings. The surface of the electrophoretic coating area is calculated using the formula: (2 x total weight of product shell)/(average thickness of metal sheet x density of metal sheet). The total ELVs defined in the table above refer to all process stages carried out at the same installation from electrophoretic coating, or any other kind of coating process through the final wax and polish of top-coating inclusive, as well as solvent used in cleaning of process equipment, including spray booths and other fixed equipment, both during and outside of production time.

^{b/} For existing plants achieving these levels may entail cross-media effects, high capital costs and long payback periods. Major step decreases in VOC emissions necessitate changing the type of paint system and/or the paint application system and/or the drying system and this usually involves either a new installation or a complete refurbishment of a paint shop and requires significant capital investment.

12. Coating activities (metal, textile, fabric, film, plastic, paper and wooden surfaces coating):

Table 5

Limit values for coating activities in various industrial sectors

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Option 2	Option 3
Wood coating (solvent consumption 15–25 Mg/year)		ELVc = 100 ^{a/} mg C/Nm ³ ELVf = 25 wt-% or less of the solvent input <i>Or</i> total ELV of 1.6 kg or less of VOC/kg of solid input
Wood coating (solvent consumption 25–200 Mg/year)		ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ELVf = 20 wt-% or less of the solvent input <i>Or</i> total ELV of 1 kg or less of VOC/kg of solid input
Wood coating (solvent consumption > 200 Mg/year)	ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ELVf = 15 wt-% or less of the solvent input <i>Or</i> total ELV of 0.75 kg or less of VOC/kg of solid input	
Coating of metal and plastics (solvent consumption 5–15 Mg/year)		ELVc = 100 ^{a/, b/} mg C/Nm ³ ELVf = 25 ^{b/} wt-% or less of the solvent input <i>Or</i> total ELV of 0.6 kg or less of VOC/kg of solid input
Other coating, including textile, fabric film and paper (excluding web screen printing for textiles, see printing) (solvent consumption 5–15 Mg/year)		ELVc = 100 ^{a/, b/} mg C/Nm ³ ELVf = 25 ^{b/} wt-% or less of the solvent input <i>Or</i> total ELV of 1.6 kg or less of VOC/kg of solid input
Textile, fabric, film and paper coating (excluding web screen printing for textiles, see printing) (solvent consumption > 15 Mg/year)		ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ^{b/, c/} ELVf = 20 ^{b/} wt-% or less of the solvent input <i>Or</i> total ELV of 1 kg or less of VOC/kg of solid input

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Option 2	Option 3
Coating of plastic workpieces (solvent consumption 15–200 Mg/year)		ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ^{b/} ELVf = 20 ^{b/} wt-% or less of the solvent input Or total ELV of 0.375 kg or less of VOC/kg of solid input
Coating of plastic workpieces (solvent consumption > 200 Mg/year)	ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ^{b/} ELVf = 20 ^{b/} wt-% or less of the solvent input Or total ELV of 0.35 kg or less of VOC/kg of solid input	
Coating of metal surfaces (solvent consumption 15–200 Mg/year)		ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ^{b/} ELVf = 20 ^{b/} wt-% or less of the solvent input Or total ELV of 0.375 kg or less of VOC/kg of solid input Exception for coatings in contact with food: Total ELV of 0.5825 kg or less of VOC/kg of solid input
Coating of metal surfaces (solvent consumption >200 Mg/year)	ELVc = 50 mg C/Nm ³ for drying and 75 mg C/Nm ³ for coating ^{b/} ELVf = 20 ^{b/} wt-% or less of the solvent input Or total ELV of 0.33 kg or less of VOC/kg of solid input	Exception for coatings in contact with food: Total ELV of 0.5825 kg or less of VOC/kg of solid input

^{a/} Limit value applies to coating applications and drying processes operated under contained conditions.

^{b/} If contained coating conditions are not possible (boat construction, aircraft coating, etc.), installations may be granted exemption from these values. The reduction scheme is then to be used, unless it is demonstrated to the satisfaction of the competent authority that this option is not technically and economically feasible. In this case, the operator must demonstrate to the satisfaction of the competent authority that the best available technique is used.

^{c/} If, for textile coating, techniques are used which allow reuse of recovered solvents, the limit value shall be 150 mg C/Nm³ for drying and coating together.

13. Coating activities (leather and winding wire coating):

Table 6

Limit values for leather and winding wire coating

Activity and threshold	ELV for VOC[(yearly for total ELV)]
	Options 1, 2 and 3
Leather coating in furnishing and particular leather goods used as small consumer goods like bags, belts, wallets, etc. (solvent consumption > 10 Mg/year)	Total ELV of 150 g/m ²
Other leather coating (solvent consumption 10–25 Mg/year)	Total ELV of 85 g/m ²
Other leather coating (solvent consumption > 25 Mg/year)	Total ELV of 75 g/m ²
Winding wire coating (solvent consumption > 5 Mg/year)	Total ELV of 10 g/kg applies for installations where average diameter of wire ≤ 0,1 mm Total ELV of 5 g/kg applies for all other installations

14. Coil coating:

Table 7

Limit values for coil coating

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]
	Option 3
Existing installation (solvent consumption 25–200 Mg/year)	ELVc = 50 mg ^{a/} C/Nm ³ ELVf = 10 wt-% or less of the solvent input Or total ELV of 0.45 kg or less of VOC/kg of solid input
Existing installation (solvent consumption > 200 Mg/year)	ELVc = 50 mg ^{a/} C/Nm ³ ELVf = 10 wt-% or less of the solvent input Or total ELV of 0.45 kg or less of VOC/kg of solid input
New installation (solvent consumption 25–200 Mg/year)	ELVc = 50 mg C/Nm ^{3 a/} ELVf = 5 wt-% or less of the solvent input Or total ELV of 0.3 kg or less of VOC/kg of solid input
New installation (solvent consumption > 200 Mg/year)	ELVc = 50 mg ^{a/} C/Nm ³ ELVf = 5 wt-% or less of the solvent input Or total ELV of 0.3 kg or less of VOC/kg of solid input

^{a/} If techniques are used which allow reuse of recovered solvent, the limit value shall be 150 mg C/Nm³.

15. Dry cleaning:

Table 8

Limit values for dry cleaning

Activity	ELV for VOC ^{a/, b/} [(yearly for total ELV)]
	Option 3
New and existing installations	Total ELV of 20 g VOC/kg

^{a/} Limit value for total emissions of VOCs calculated as mass of emitted VOC per mass of cleaned and dried product.

^{b/} This emission level can be achieved by using at least type IV machines or more efficient ones.

16. Manufacturing of coatings, varnishes, inks and adhesives:

Table 9

Limit values form manufacturing of coatings, varnishes, inks and adhesives

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]
	Option 3
New and existing installations with solvent consumption between 100 and 1,000 Mg/year	ELVc = 150 mg C/Nm ³ ELVf ^{a/} = 5 wt-% or less of the solvent input Or total ELV of 5 wt-% or less of the solvent input
New and existing installations with solvent consumption > 1,000 Mg/year	ELVc = 150 mg C/Nm ³ ELVf ^{a/} = 3 wt-% or less of the solvent input Or total ELV of 3 wt-% or less of the solvent input

^{a/} The fugitive limit value does not include solvents sold as part of a preparation in a sealed container.

17. Printing activities (flexography, heat-set web offset, publication rotogravure, etc.):

Table 10

Limit values for printing activities

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Option 2	Option 3
Heat-set offset (solvent consumption 15–25 Mg/year)		ELVc = 100 mg C/Nm ³ ELVf = 30 wt-% or less of the solvent input ^{a/}
Heat-set offset (solvent consumption		New and existing installations

<i>ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]</i>		
<i>Activity and threshold</i>	<i>Option 2</i>	<i>Option 3</i>
25–200 Mg/year)		ELVc = 20 mg C/Nm ³ ELVf = 30 wt-% or less of the solvent input ^{a/}
Heat-set offset (solvent consumption >200 Mg/year)	For new and upgraded presses Total ELV = 10 wt-% or less of the ink consumption ^{a/} For existing <u>presses</u> Total ELV = 15 wt-% or less of the ink consumption ^{a/}	existing installations [ELVc = 20 mg/Nm ³ ELVf = 30 wt-% or less of the solvent input ^{a/} - delete]
Publication gravure (solvent consumption 25–200 Mg/year)	For new installations	ELVc = 75 mg C/Nm ³ ELVf = 10 wt-% or less of the solvent input <i>Or</i> total ELV of 0.6 kg or less of VOC/kg of solid input
	For existing installations	ELVc = 75 mg C/Nm ³ ELVf = 15 wt-% or less of the solvent input <i>Or</i> total ELV of 0.8 kg or less of VOC/kg of solid input
Publication gravure (solvent consumption > 200 Mg/year)	For new installations Total ELV = 5 wt-% or less of the solvent input	[ELVc = 75 mg C/Nm ³ ELVf = 10 wt-% or less of the solvent input <i>Or</i> total ELV of 0.6 kg or less of VOC/kg of solid input – <u>delete</u>]
	For existing installations Total ELV = 7 wt-% or less of the solvent input	[ELVc = 75 mg C/Nm ³ ELVf = 15 wt-15% or less of the solvent input <i>Or</i> total ELV of 0.8 kg or less of VOC/kg of solid input – delete]

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Option 2	Option 3
Packaging rotogravure and flexography (solvent consumption 15–25 Mg/year)		ELVc = 100 mg C/Nm ³ ELVf = 25 wt-% or less of the solvent input <i>Or</i> total ELV of 1.2 kg or less of VOC/kg of solid input
Packaging rotogravure and flexography (solvent consumption 25–200 Mg/year) and rotary screen printing (solvent consumption > 30 Mg/year)		ELVc = 100 mg C/Nm ³ ELVf = 20 wt-% or less of the solvent input <i>Or</i> total ELV of 1.0 kg or less of VOC/kg of solid input
Packaging rotogravure and flexography (solvent consumption > 200 Mg/year)	<p><i>For plants with all machines connected to oxidation:</i></p> <p>Total ELV = 0.5 kg VOC/kg of solid input</p> <p><i>For plants with all machines connected to carbon adsorption:</i></p> <p>Total ELV = 0.6 kg VOC/kg of solid input</p> <p><i>For existing mixed plants where some existing machines may not be attached to an incinerator or solvent recovery:</i></p> <p>Emissions from <i>the machines connected to oxidizers or carbon adsorption</i> are below the emission limits of 0.5 or 0.6 kg VOC/kg of solid input respectively.</p> <p><i>For machines not connected to gas treatment:</i> use of low solvent or solvent free products, connection to waste gas treatment when there is spare capacity and preferentially run high solvent content work on machines connected to waste gas treatment.</p> <p>Total emissions below 1.0 kg VOC/kg of solid input</p>	<p>[For existing installations</p> <p>ELVc = 100 mg C/Nm³</p> <p>ELVf = 20 wt-% or less of the solvent input</p> <p><i>Or</i> total ELV = 25% of reference emission^{b/} - delete]</p>

^{a/} Residual solvent in the finished product is not taken into account in the calculation of the fugitive emission.

18. Manufacturing of pharmaceutical products:

Table 11

Limit values for manufacturing of pharmaceutical products

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Option 3	
New installations (solvent consumption > 50 Mg/year)	ELVc = 20 mg C/Nm ³ ^{a/,b/}	ELVf = 5 wt-% or less of the solvent input ^{b/}
Existing installations (solvent consumption > 50 Mg/year)	ELVc = 20 mg C/Nm ³ ^{a/,c/}	ELVf = 15 wt-% or less of the solvent input ^{c/}

^{a/} If techniques are used which allow reuse of recovered solvents, the limit value shall be 150 mg C/Nm³.

^{b/} A total limit value of 5% of solvent input may be applied instead of applying ELVc and ELVf.

^{c/} A total limit value of 15% of solvent input may be applied instead of applying ELVc and ELVf.

19. Conversion of natural or synthetic rubber:

Table 12

Limit values for conversion of natural or synthetic rubber

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Options 1, 2 and 3	
New and existing installations: conversion of natural or synthetic rubber (solvent consumption > 15 Mg/year)	ELVc = 20 ^{a/} ELVf = 25 ^{b/}	Or total ELV = 25% of solvent input

^{a/} If techniques are used which allow reuse of recovered solvent, the limit value shall be 150 mg C/Nm³.

^{b/} The fugitive limit does not include solvents sold as part of a preparation in a sealed container.

20. Surface cleaning:

Table 13

Limit values for surface cleaning

Activity and threshold	Threshold value for solvent consumption (Mg/year)	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
		Option 3	
Surface cleaning using substances mentioned in paragraph 3 (z) (i) of this annex	1–5	ELVc = 20 mg compound/Nm ³	ELVf = 15% of solvent input
	> 5	ELVc = 20 mg compound/Nm ³	ELVf = 10% of solvent input

Other surface cleaning	2–10	ELVc = 75 mg C/Nm ³ ^{a/}	ELVf = 20% ^{a/} of solvent input
	> 10	ELVc = 75 mg C/Nm ³ ^{a/}	ELVf = 15% ^{a/} of solvent input

^{a/} Installations which demonstrate to the competent authority that the average organic solvent content of all cleaning material used does not exceed 30% w/w are exempt from applying these values.

21. Vegetable oil and animal fat extraction and vegetable oil refining processes:

Table 14

Limit values for extraction of vegetable and animal fat and refining of vegetable oil

Activity and threshold	ELV for VOC [(yearly for total ELV)]	
	Options 1, 2 and 3	
New and existing installations (solvent consumption > 10 Mg/year)	Total ELV (kg VOC/Mg product)	
	Animal fat:	1.5
	Castor:	3.0
	Rape seed:	1.0
	Sunflower seed:	1.0
	Soya beans (normal crush):	0.8
	Soya beans (white flakes):	1.2
	Other seeds and vegetable material:	3.0 ^{a/}
	All fractionation processes, excluding degumming: ^{b/}	1.5
Degumming:	4.0	

^{a/} Limit values for total emissions of VOCs from installations treating single batches of seeds or other vegetable material shall be set case by case by the competent authorities on the basis of the best available techniques.

^{b/} The removal of gum from the oil.

22. Impregnation of wood:

Table 15

Limit values for impregnation of wood

Activity and threshold	ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]	
	Option 2	Option 3
Wood impregnation (solvent consumption 25–200 Mg/year)		ELVc = 100 ^{a/} mg C/Nm ³ ELVf = 45 wt-% or less of the solvent input Or 11 kg or less of VOC/m ³

<i>Activity and threshold</i>	<i>ELV for VOC [(daily for ELVc and yearly for ELVf and total ELV)]</i>	
	<i>Option 2</i>	<i>Option 3</i>
Wood impregnation (solvent consumption > 200 Mg/year)	ELVc = 100 ^{a/} mg C/Nm ³ ELVf = 35 wt-% or less of the solvent input <i>Or</i> 9 kg or less of VOC/m ³	

^{a/} Does not apply to impregnation with creosote.

B. Canada

23. Limit values for controlling emissions of VOCs will be determined for stationary sources, as appropriate, taking into account information on available control technologies, limit values applied in other jurisdictions, and the documents below:

- (a) VOC Concentration Limits for Architectural Coatings Regulations — SOR/2009-264;
- (b) VOC Concentration Limits for Automotive Refinishing Products. SOR/2009-197;
- (c) Proposed regulations for VOC Concentrations Limits for Certain Products;
- (d) Guidelines for the Reduction of Ethylene Oxide Releases from Sterilization Applications;
- (e) Environmental Guideline for the Control of Volatile Organic Compounds Process Emissions from New Organic Chemical Operations. PN1108;
- (f) Environmental Code of Practice for the Measurement and Control of Fugitive VOC Emissions from Equipment Leaks. PN1106;
- (g) A Program to Reduce Volatile Organic Compound Emissions by 40 Percent from Adhesives and Sealants. PN1116;
- (h) A Plan to Reduce VOC Emissions by 20 Percent from Consumer Surface Coatings. PN1114;
- (i) Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks. PN1180;
- (j) Environmental Code of Practice for Vapour Recovery during Vehicle Refueling at Service Stations and Other Gasoline Dispensing Facilities. PN1184;
- (k) Environmental Code of Practice for the Reduction of Solvent Emissions from Commercial and Industrial Degreasing Facilities. PN1182;
- (l) New Source Performance Standards and Guidelines for the Reduction of Volatile Organic Compound Emissions from Canadian Automotive Original Equipment Manufacturer (OEM) Coating Facilities. PN1234;
- (m) Environmental Guideline for the Reduction of Volatile Organic Compound Emissions from the Plastics Processing Industry. PN1276;

- (n) National Action Plan for the Environmental Control of Ozone-Depleting Substances (ODS) and Their Halocarbon Alternatives. PN1291;
- (o) Management Plan for Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOCs) — Phase I. PN1066;
- (p) Environmental Code of Practice for the Reduction of Volatile Organic Compound Emissions from the Commercial/Industrial Printing Industry. PN1301;
- (q) Recommended CCME¹⁴ Standards and Guidelines for the Reduction of VOC Emissions from Canadian Industrial Maintenance Coatings. PN1320; and
- (r) Guidelines for the Reduction of VOC Emissions in the Wood Furniture Manufacturing Sector. PN1338.

C. United States of America

24. Limit values for controlling emissions of VOCs from new stationary sources in the following stationary source categories are specified in the following documents:

- (a) Storage Vessels for Petroleum Liquids — 40 Code of Federal Regulations (C.F.R.) Part 60, Subpart K, and Subpart Ka;
- (b) Storage Vessels for Volatile Organic Liquids — 40 C.F.R. Part 60, Subpart Kb;
- (c) Petroleum Refineries — 40 C.F.R. Part 60, Subpart J;
- (d) Surface Coating of Metal Furniture — 40 C.F.R. Part 60, Subpart EE;
- (e) Surface Coating for Automobile and Light Duty Trucks — 40 C.F.R. Part 60, Subpart MM;
- (f) Publication Rotogravure Printing — 40 C.F.R. Part 60, Subpart QQ;
- (g) Pressure Sensitive Tape and Label Surface Coating Operations — 40 C.F.R. Part 60, Subpart RR;
- (h) Large Appliance, Metal Coil and Beverage Can Surface Coating — 40 C.F.R. Part 60, Subpart SS, Subpart TT and Subpart WW;
- (i) Bulk Gasoline Terminals — 40 C.F.R. Part 60, Subpart XX;
- (j) Rubber Tire Manufacturing — 40 C.F.R. Part 60, Subpart BBB;
- (k) Polymer Manufacturing — 40 C.F.R. Part 60, Subpart DDD;
- (l) Flexible Vinyl and Urethane Coating and Printing — 40 C.F.R. Part 60, Subpart FFF;
- (m) Petroleum Refinery Equipment Leaks and Wastewater Systems — 40 C.F.R. Part 60, Subpart GGG and Subpart QQQ;
- (n) Synthetic Fiber Production — 40 C.F.R. Part 60, Subpart HHH;
- (o) Petroleum Dry Cleaners — 40 C.F.R. Part 60, Subpart JJJ;

¹⁴ Canadian Council of Ministers of the Environment.

- (p) Onshore Natural Gas Processing Plants — 40 C.F.R. Part 60, Subpart KKK;
 - (q) SOCFMI Equipment Leaks, Air Oxidation Units, Distillation Operations and Reactor Processes — 40 C.F.R. Part 60, Subpart VV, Subpart III, Subpart NNN and Subpart RRR;
 - (r) Magnetic Tape Coating — 40 C.F.R. Part 60, Subpart SSS;
 - (s) Industrial Surface Coatings — 40 C.F.R. Part 60, Subpart TTT;
 - (t) Polymeric Coatings of Supporting Substrates Facilities — 40 C.F.R. Part 60, Subpart VVV;
 - (u) Stationary Internal Combustion Engines — Spark Ignition, 40 C.F.R. Part 60, Subpart JJJJ;
 - (v) Stationary Internal Combustion Engines — Compression Ignition, 40 C.F.R. Part 60, Subpart IIII and
 - (w) New and in-use portable fuel containers — 40 C.F.R. Part 59, Subpart F.
25. Limit values for controlling emissions of VOC from new and existing sources subject to National Emission Standards for Hazardous Air Pollutants (HAPs) are specified in the following documents:
- (a) Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry — 40 C.F.R. Part 63, Subpart F;
 - (b) Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry: Process Vents, Storage Vessels, Transfer Operations, and Wastewater — 40 C.F.R. Part 63, Subpart G;
 - (c) Organic HAPs: Equipment Leaks — 40 C.F.R. Part 63, Subpart H;
 - (d) Commercial ethylene oxide sterilizers — 40 C.F.R. Part 63, Subpart O;
 - (e) Bulk gasoline terminals and pipeline breakout stations — 40 C.F.R. Part 63, Subpart R;
 - (f) Halogenated solvent degreasers — 40 C.F.R. Part 63, Subpart T;
 - (g) Polymers and resins (Group I) — 40 C.F.R. Part 63, Subpart U;
 - (h) Polymers and resins (Group II) — 40 C.F.R. Part 63, Subpart W;
 - (i) Secondary lead smelters — 40 C.F.R. Part 63, Subpart X;
 - (j) Marine tank vessel loading — 40 C.F.R. Part 63, Subpart Y;
 - (k) Petroleum refineries — 40 C.F.R. Part 63, Subpart CC;
 - (l) Offsite waste and recovery operations — 40 C.F.R. Part 63, Subpart DD;
 - (m) Magnetic tape manufacturing — 40 C.F.R. Part 63, Subpart EE;
 - (n) Aerospace manufacturing — 40 C.F.R. Part 63, Subpart GG;
 - (o) Oil and natural gas production — 40 C.F.R. Part 63, Subpart HH;
 - (p) Ship building and ship repair — 40 C.F.R. Part 63, Subpart II;
 - (q) Wood furniture — 40 C.F.R. Part 63, Subpart JJ;

- (r) Printing and publishing — 40 C.F.R. Part 63, Subpart KK;
- (s) Pulp and paper II (combustion) — C.F.R. Part 63, Subpart MM;
- (t) Storage tanks — 40 C.F.R. Part 63, Subpart OO;
- (u) Containers — 40 C.F.R. Part 63, Subpart PP;
- (v) Surface impoundments — 40 C.F.R. Part 63, Subpart QQ;
- (w) Individual drain systems — 40 C.F.R. Part 63, Subpart RR;
- (x) Closed vent systems — 40 C.F.R. Part 63, Subpart SS;
- (y) Equipment leaks: control level 1 — 40 C.F.R. Part 63, Subpart TT;
- (z) Equipment leaks: control level 2 — 40 C.F.R. Part 63, Subpart UU;
- (aa) Oil-Water Separators and Organic-Water Separators — 40 C.F.R. Part 63, Subpart VV;
- (bb) Storage Vessels (Tanks): Control Level 2 — 40 C.F.R. Part 63, Subpart WW;
- (cc) Ethylene Manufacturing Process Units — 40 C.F.R. Part 63, Subpart XX;
- (dd) Generic Maximum Achievable Control Technology Standards for several categories — 40 C.F.R. Part 63, Subpart YY;
- (ee) Hazardous waste combustors — 40 C.F.R. Part 63, Subpart EEE;
- (ff) Pharmaceutical manufacturing — 40 C.F.R. Part 63, Subpart GGG;
- (gg) Natural Gas Transmission and Storage — 40 C.F.R. Part 63, Subpart HHH;
- (hh) Flexible Polyurethane Foam Production — 40 C.F.R. Part 63, Subpart III;
- (ii) Polymers and Resins: group IV — 40 C.F.R. Part 63, Subpart JJJ;
- (jj) Portland cement manufacturing — 40 C.F.R. Part 63, Subpart LLL;
- (kk) Pesticide active ingredient production — 40 C.F.R. Part 63, Subpart MMM;
- (ll) Polymers and resins: group III — 40 C.F.R. Part 63, Subpart OOO;
- (mm) Polyether polyols — 40 C.F.R. Part 63, Subpart PPP;
- (nn) Secondary aluminum production — 40 C.F.R. Part 63, Subpart RRR;
- (oo) Petroleum refineries — 40 C.F.R. Part 63, Subpart UUU;
- (pp) Publicly owned treatment works — 40 C.F.R. Part 63, Subpart VVV;
- (qq) Nutritional Yeast Manufacturing — 40 C.F.R. Part 63, Subpart CCCC;
- (rr) Organic liquids distribution (non-gasoline) — 40 C.F.R. Part 63, Subpart EEEE;
- (ss) Miscellaneous organic chemical manufacturing — 40 C.F.R. Part 63, Subpart FFFF;

- (tt) Solvent Extraction for Vegetable Oil Production — 40 C.F.R. Part 63, Subpart GGGG;
- (uu) Auto and Light Duty Truck Coatings — 40 C.F.R. Part 63, Subpart IIII;
- (vv) Paper and Other Web Coating — 40 C.F.R. Part 63, Subpart JJJJ;
- (ww) Surface Coatings for Metal Cans — 40 C.F.R. Part 63, Subpart KKKK;
- (xx) Miscellaneous Metal Parts and Products Coatings — 40 C.F.R. Part 63, Subpart MMMM;
- (yy) Surface Coatings for Large Appliances — 40 C.F.R. Part 63, Subpart NNNN;
- (zz) Printing, Coating and Dyeing of Fabric — 40 C.F.R. Part 63, Subpart OOOO;
- (aaa) Surface Coating of Plastic Parts and Products — 40 C.F.R. Part 63, Subpart PPPP;
- (bbb) Surface Coating of Wood Building Products — 40 C.F.R. Part 63, Subpart QQQQ;
- (ccc) Metal Furniture Surface Coating — 40 C.F.R. Part 63, Subpart RRRR;
- (ddd) Surface coating for metal coil — 40 C.F.R. Part 63, Subpart SSSS;
- (eee) Leather finishing operations — 40 C.F.R. Part 63, Subpart TTTT;
- (fff) Cellulose products manufacturing — 40 C.F.R. Part 63, Subpart UUUU;
- (ggg) Boat manufacturing — 40 C.F.R. Part 63, Subpart VVVV;
- (hhh) Reinforced Plastics and Composites Production — 40 C.F.R. Part 63, Subpart WWWW;
- (iii) Rubber tire manufacturing — 40 C.F.R. Part 63, Subpart XXXX;
- (jjj) Stationary Combustion Engines — 40 C.F.R. Part 63, Subpart YYYYY;
- (kkk) Stationary Reciprocating Internal Combustion Engines: Compression Ignition — 40 C.F.R. Part 63, Subpart ZZZZ;
- (lll) Semiconductor manufacturing — 40 C.F.R. Part 63, Subpart BBBB;
- (mmm) Iron and steel foundries — 40 C.F.R. Part 63, Subpart EEEEE;
- (nnn) Integrated iron and steel manufacturing — 40 C.F.R. Part 63, Subpart FFFFF;
- (ooo) Asphalt Processing and Roofing Manufacturing — 40 C.F.R. Part 63, Subpart LLLLL;
- (ppp) Flexible Polyurethane Foam Fabrication — 40 C.F.R. Part 63, Subpart MMMM;
- (qqq) Engine test cells/stands — 40 C.F.R. Part 63, Subpart PPPPP;
- (rrr) Friction products manufacturing — 40 C.F.R. Part 63, Subpart QQQQ;

- (sss) Refractory products manufacturing — 40 C.F.R. Part 63, Subpart SSSSS;
- (ttt) Hospital ethylene oxide sterilizers — 40 C.F.R. Part 63, Subpart WWWW;
- (uuu) Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities — 40 C.F.R. Part 63, Subpart BBBB;
- (vvv) Gasoline Dispensing Facilities — 40 C.F.R. Part 63, Subpart CCCCC;
- (www) Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources — 40 C.F.R. Part 63, Subpart HHHH;
- (xxx) Acrylic Fibers/Modacrylic Fibers Production (Area Sources) — 40 C.F.R. Part 63, Subpart LLLLL;
- (yyy) Carbon Black Production (Area Sources) — 40 C.F.R. Part 63, Subpart MMMM;
- (zzz) Chemical Manufacturing Area Sources: Chromium Compounds — 40 C.F.R. Part 63, Subpart NNNN;
- (aaaa) Chemical Manufacturing for Area Sources — 40 C.F.R. Part 63, Subpart VVVV;
- (bbbb) Asphalt Processing and Roofing Manufacturing (Area Sources) — 40 C.F.R. Part 63, Subpart AAAAAA; and
- (cccc) Paints and Allied Products Manufacturing (Area Sources) — 40 C.F.R. Part 63, Subpart CCCCCC.

S. Annex VII

1. In paragraph 1 (a):
 - (a) A colon is inserted after the words “stationary sources”;
 - (b) The words “(i) In the case of a Party that is not a country with an economy in transition,” are inserted before the words “one year”; and
 - (c) A new subparagraph (a) (ii) is inserted as follows:
 - (ii) In the case of a Party that is a country with an economy in transition, up to five years after entry into force of the present Protocol for the Party in question;
2. In paragraph 1 (b):
 - (a) In subparagraph (b) (i):
 - (i) The words “for the Party in question” are inserted after the words “present Protocol”; and
 - (ii) The year “2007” is replaced by the year “2020”.
 - (b) In subparagraph (b) (ii):
 - (i) The word “eight” is replaced by the word “fifteen”; and
 - (ii) The words “for the Party in question” are inserted at the end of the subparagraph.
3. In paragraph 2, all instances of the figure “II” are replaced by the number “2”.

4. In subparagraphs 2 (i) and 2 (ii), the words “for the Party in question” are inserted after the words “present Protocol”.
5. Paragraph 3 is deleted.
6. A new paragraph 4 is inserted as follows:
 - [4. The timescales for the application of the limit values for VOC in products not covered by annex VI referred to in article 3, paragraph 7, shall be:
 - [(a) In the case of a Party that is not a country with an economy in transition], one year after the date of entry into force of the present Protocol for the Party in question; and
 - [(b) In the case of a Party that is a country with an economy in transition, five years after the date of entry into force of the present Protocol for the Party in question.]]

T. Annex VIII

For annex VIII the following text is substituted:

Limit values for fuels and new mobile sources

Introduction

1. Section A applies to Parties other than Canada and the United States of America, section B applies to Canada and section C applies to the United States of America.
2. The annex specifies emission limit values for NO_x, expressed as nitrogen dioxide (NO₂) equivalents, for hydrocarbons, most of which are volatile organic compounds, for carbon monoxide (CO) and for dust, as well as environmental specifications for marketed fuels for vehicles.
3. The timescales for applying the limit values in this annex are laid down in annex VII.

A. Parties other than Canada and the United States of America

Passenger cars and light-duty vehicles

4. Limit values for power-driven vehicles with at least four wheels and used for the carriage of passengers (category M) and goods (category N) are given in table 1.

Heavy-duty vehicles

5. Limit values for engines for heavy-duty vehicles are given in tables 2, 3 and 4, depending on the applicable test procedures.

Compression-ignition (CI) and spark-ignition (SI) non-road vehicles and machines

6. Limit values for agricultural and forestry tractors and other non-road vehicle/machine engines are listed in tables 5 to 7.
7. Limit values for locomotives and railcars are listed in tables 8 and 9.
8. Limit values for inland waterway vessels are listed in table 10.

9. Limit values for recreational crafts are listed in table 11.

Motorcycles and mopeds

10. Limit values for motorcycles and mopeds are given in tables 12 and 13.

Fuel quality

11. Environmental quality specifications for petrol and diesel are given in tables 14 and 15.

Table 1
Limit values for passenger cars and light-duty vehicles

			Limit values ^[d/ - delete] ^{aw}												
Category	Class, application date	Reference mass (RW) (kg)	Carbon monoxide		Total Hydrocarbons (HC)		NMVOC		Nitrogen oxides		Hydrocarbons and nitrogen oxides combined		[Particulates ^{aw} - delete] Particulate matter		
			L1 (g/km)		L2 (g/km)		L3 (g/km)		L4 (g/km)		L2 + L4 (g/km)		L5 (g/km)		
			Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	
[Euro 3 - delete]	[M ^{b/} - delete]	[All - delete]	[2.3 - delete]	[0.64 - delete]	[0.20 - delete]	-	-	-	[0.15 - delete]	[0.50 - delete]	-	[0.56 - delete]	-	[0.05 - delete]	
	[N ₁ ^{d/} - delete]	[I - delete]	[RW ≤ 1305 - delete]	[2.3 - delete]	[0.64 - delete]	[0.20 - delete]	-	-	-	[0.15 - delete]	[0.50 - delete]	-	[0.56 - delete]	-	[0.05 - delete]
		[II - delete]	[1305 < RW ≤ 1760 - delete]	[4.17 - delete]	[0.80 - delete]	[0.25 - delete]	-	-	-	[0.18 - delete]	[0.65 - delete]	-	[0.72 - delete]	-	[0.07 - delete]
		[II - delete]	[1760 < RW - delete]	[5.22 - delete]	[0.95 - delete]	[0.29 - delete]	-	-	-	[0.21 - delete]	[0.78 - delete]	-	[0.86 - delete]	-	[0.10 - delete]
[Euro 4 - delete]	[M ^{b/} - delete]	[All - delete]	[1.0 - delete]	[0.50 - delete]	[0.10 - delete]	-	-	-	[0.08 - delete]	[0.25 - delete]	-	[0.30 - delete]	-	[0.025 - delete]	
	[N ₁ ^{c/} - delete]	[I - delete]	[RW 1305 - delete]	[1.0 - delete]	[0.50 - delete]	[0.10 - delete]	-	-	-	[0.08 - delete]	[0.25 - delete]	-	[0.30 - delete]	-	[0.025 - delete]
		[II - delete]	[1305 < RW ≤ 1760 - delete]	[1.81 - delete]	[0.63 - delete]	[0.13 - delete]	-	-	-	[0.10 - delete]	[0.33 - delete]	-	[0.39 - delete]	-	[0.04 - delete]
		[III - delete]	[1760 < RW - delete]	[2.27 - delete]	[0.74 - delete]	[0.16 - delete]	-	-	-	[0.11 - delete]	[0.39 - delete]	-	[0.46 - delete]	-	[0.06 - delete]
Euro 5	M ^{b/}	2009	All	1.0	0.50	0.10	-	0.068	-	0.06	0.18	-	0.23	0.0050	0.0050
	N ₁ ^{c/}	I, 2009	RW 1305	1.0	0.50	0.10	-	0.068	-	0.06	0.18	-	0.23	0.0050	0.0050
		II, 2010	1305 < RW ≤ 1760	1.81	0.63	0.13	-	0.090	-	0.075	0.235	-	0.295	0.0050	0.0050

Category	Class, application date	Reference mass (RW) (kg)	Limit values ^{a/} - delete ^{a/}												
			Carbon monoxide		Total Hydrocarbons (HC)		NMVOC		Nitrogen oxides		Hydrocarbons and nitrogen oxides combined		[Particulates ^{a/} - delete] Particulate matter		
			L1 (g/km)		L2 (g/km)		L3 (g/km)		L4 (g/km)		L2 + L4 (g/km)		L5 (g/km)		
			Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	
Euro 6	III, 2010	1760 < RW	2.27	0.74	0.16	-	0.108	-	0.082	0.28	-	0.35	0.0050	0.0050	
	N ₂	2010	2.27	0.74	0.16	-	0.108	-	0.082	0.28	-	0.35	0.0050	0.0050	
	M ^{b/}	2014	All	1.0	0.50	0.10	-	0.068	-	0.06	0.08	-	0.17	0.0050	0.0050
	N ₁ ^{c/}	I, 2014	RW ≤ 1305	1.0	0.50	0.10	-	0.068	-	0.06	0.08	-	0.17	0.0050	0.0050
		II, 2015	1305 < RW ≤ 1760	1.81	0.63	0.13	-	0.090	-	0.075	0.105	-	0.195	0.0050	0.0050
		III, 2015	1760 < RW	2.27	0.74	0.16	-	0.108	-	0.082	0.125	-	0.215	0.0050	0.0050
	N ₂	2015		2.27	0.74	0.16	-	0.108	-	0.082	0.125	-	0.215	0.0050	0.0050

[NB: the issue of particulates/km to be discussed further]

^{a/} Test cycle specified by [...]

^{b/} Except vehicles whose maximum mass exceeds 2,500 kg.

^{c/} And those category M vehicles specified in note b.

Table 2
Limit values for heavy-duty vehicles — European steady-state cycle (ESC) and European load-response (ELR) tests

	Application date	Carbon monoxide (g/kWh)	Hydrocarbons (g/kWh)	Nitrogen oxides (g/kWh)	Particulate matter (g/kWh)	Smoke (m ⁻¹)
B2 (“EURO V”)	2008	1.5	0.46	2.0	0.02	0.5
“EURO VI”	2013	1.5	0.13	0.40	0.010	

^{a/} For engines with a swept volume below 0.75 dm³ per cylinder and a rated power speed above 3,000 revolutions per minute.

Table 3
Limit values for heavy-duty vehicles — European transient cycle (ETC) test

	Application date	Carbon monoxide (g/kWh)	Non-methane hydrocarbons (g/kWh)	Methane ^{a/} (g/kWh)	Nitrogen oxides (g/kWh)	Particulates (g/kWh) ^{b/}
B2 EURO V	2008	4.0	0.55	1.1	2.0	0.03

^{a/} For natural gas engines only.

^{b/} Not applicable to gas-fuelled engines at stage B2.

^{c/} For engines with a swept volume below 0.75 dm³ per cylinder and a rated power speed above 3,000 revolutions per minute.

Table 4
Limit values for heavy-duty vehicles — European transient cycle (ETC) test

	Application date	Carbon monoxide (g/kWh)	Total hydrocarbons (g/kWh)	Non-methane hydrocarbons (g/kWh)	Methane (g/kWh)	Nitrogen oxides (g/kWh)	Particulates (g/kWh) ^{b/}
EURO VI (CI)	2013	4.0	0.160			0.40	0.010
EURO VI (PI)	2013	4.0		0.160	0.50	0.40	0.010

Note: PI = Positive ignition, CI = Compression ignition.

Table 5
Limit values for diesel engines for non-road mobile machines, agricultural and forestry tractors

Net power (P) (kW)	Application date	Carbon monoxide (g/kWh)	Hydrocarbons (g/kWh)	Nitrogen oxides (g/kWh)	Particulate matter (g/kWh)
130 ≤ P ≤ 560	2009	3.5	0.19	2.0	0.025
75 ≤ P < 130	2010	5.0	0.19	3.3	0.025
56 ≤ P < 75	2010	5.0	0.19	3.3	0.025
37 ≤ P < 56	2011	5.0		4.7	0.025

Table 6
Limit values for diesel engines for non-road mobile machines, agricultural and forestry tractors

<i>Net power (P) (kW)</i>	<i>Application date</i>	<i>Carbon monoxide (g/kWh)</i>	<i>Hydrocarbons (g/kWh)</i>	<i>Nitrogen oxides (g/kWh)</i>	<i>Particulate matter (g/kWh)</i>
$130 \leq P \leq 560$	2012	3.5	0.19	0.4	0.025
$56 \leq P < 130$	2013	5.0	0.19	0.4	0.025

[Note: Exhaust emissions from non-road machinery may not exceed the particle count of 1×10^{12} 1/kWh for solid particles with a diameter greater than 23 nm, calculated on the basis of the current recognized status of technology, namely the ECE particle measurement programme, and in accordance with the NRSC and NRTC test cycles specified in Directive 97/68/EC.]

Table 7
Limit values for spark-ignition engines for non-road mobile machines

<i>Displacement (cm³)</i>	<i>Carbon monoxide (g/kWh)</i>	<i>Sum of hydrocarbons and oxides of nitrogen (g/kWh)^{a/}</i>
Hand-held engines		
Disp < 20	805	50
$20 \leq \text{disp.} < 50$	805	50
Disp ≥ 50	603	72
Non-hand-held engines		
Disp < 66	[519 – delete] 610	50
$66 \leq \text{disp.} < 100$	[519 – delete] 610	40
$100 \leq \text{disp.} < 225$	[519 – delete] 610	16.1
Disp ≥ 225	[519 – delete] 610	12.1

^{a/} The NO_x emissions for all engine classes must not exceed 10 g/kWh.

Table 8
Limit values for engines used for propulsion of locomotives

<i>Net power (P) (kW)</i>	<i>Carbon monoxide (g/kWh)</i>	<i>Hydrocarbons (g/kWh)</i>	<i>Nitrogen oxides (g/kWh)</i>	<i>Particulate matter (g/kWh)</i>
$130 < P$	3.5	0.19	2.0	0.025

Table 9
Limit values for engines used for propulsion of railcars

<i>Net power (P) (kW)</i>	<i>Carbon monoxide (g/kWh)</i>	<i>Sum of hydrocarbons and oxides of nitrogen (g/kWh)</i>	<i>Particulate matter (g/kWh)</i>
$130 < P$	3.5	4.0	0.025

Table 10
Limit values for engines for propulsion of inland waterways vessels

<i>Displacement (litres per cylinder/kW)</i>	<i>Carbon monoxide (g/kWh)</i>	<i>Sum of hydrocarbons and oxides of nitrogen (g/kWh)</i>	<i>Particulate matter (g/kWh)</i>
Disp. < 0.9 Power ≥ 37 kWth	5.0	7.5	0.4
0.9 ≤ disp. < 1.2	5.0	7.2	0.3
1.2 ≤ disp. < 2.5	5.0	7.2	0.2
2.5 ≤ disp. < 5.0	5.0	7.2	0.2
5.0 ≤ disp. < 15	5.0	7.8	0.27
15 ≤ disp. < 20 Power < 3300 kWth	5.0	8.7	0.5
15 ≤ disp. < 20 Power > 3300 kWth	5.0	9.8	0.5
20 ≤ disp. < 25	5.0	9.8	0.5
25 ≤ disp. < 30	5.0	11.0	0.5

Table 11
Limit values for engines in recreational crafts

<i>Engine type</i>	<i>CO (g/kWh)</i> <i>CO = A + B/P_Nⁿ</i>			<i>Hydrocarbons (HC) (g/kWh)</i> <i>HC = A + B/P_Nⁿ^{a/}</i>			<i>NO_x</i> <i>[g/kWh]</i>	<i>PM</i> <i>[g/kWh]</i>
	<i>A</i>	<i>B</i>	<i>n</i>	<i>A</i>	<i>B</i>	<i>n</i>		
2-stroke	150	600	1	30	100	0.75	10	Not Appl.
4-stroke	150	600	1	6	50	0.75	15	Not Appl.
CI	5	0	0	1.5	2	0.5	9.8	1

Note: Not Appl. = Not Applicable.

^{a/} Where A, B and n are constants and P_N is the rate engine power in kW and the emissions are measured in accordance with the harmonized standards.

Table 12
Limit values for motorcycles (> 50 cm³; > 45 km/h)

<i>Engine size</i>	<i>Limit values</i>
Motorcycle < 150 cc	HC = 0.8 g/km NO _x = 0.15 g/km
Motorcycle > 150 cc	HC = 0.3 g/km NO _x = 0.15 g/km

Table 13
Limit values for mopeds ($\leq 50 \text{ cm}^3$; $< 45 \text{ km/h}$)

	Limit values	
	CO (g/km)	HC + NO _x (g/km)
II	1.0 ^{a/}	1.2

^{a/} For 3- and 4-wheelers, 3.5 g/km.

Table 14
Environmental specifications for marketed fuels to be used for vehicles equipped with positive-ignition engines — Type: Petrol

Parameter	Unit	Limits	
		Minimum	Maximum
Research octane number		95	-
Motor octane number		85	-
Reid vapour pressure, summer period ^{a/}	kPa	-	60
Distillation:			
evaporated at 100°C	% v/v	46	-
evaporated at 150°C	% v/v	75	-
Hydrocarbon analysis:			
- olefins	% v/v	-	18.0 ^{b/}
- aromatics		-	35
- benzene		-	1
Oxygen content	% m/m	-	3.7
Oxygenates:			
- Methanol, stabilizing agents must be added	% v/v	-	3
- Ethanol, stabilizing agents may be necessary	% v/v	-	10
- Isopropyl alcohol	% v/v	-	12
- Tert-butyl alcohol	% v/v	-	15
- Isobutyl alcohol	% v/v	-	15
- Ethers containing 5 or more carbon atoms per molecule	% v/v	-	22
Other oxygenates ^{c/}	% v/v	-	15
Sulphur content	mg/kg	-	10

^{a/} The summer period shall begin no later than 1 May and shall not end before 30 September. For Parties with arctic conditions the summer period shall begin no later than 1 June and not end before 31 August and the Reid Vapour Pressure (RVP) is limited to 70 kPa.

^{b/} Except for regular unleaded petrol (minimum motor octane number (MON) of 81 and minimum research octane number (RON) of 91), for which the maximum olefin content shall be 21% v/v. These limits shall not preclude the introduction on the market of a Party of another unleaded petrol with lower octane numbers than set out here.

^{c/} Other mono-alcohols with a final distillation point no higher than the final distillation point laid down in national specifications or, where these do not exist, in industrial specifications for motor fuels.

*Table 15
Environmental specifications for marketed fuels to be used for vehicles equipped
with compression-ignition engines — Type: Diesel fuel*

<i>Parameter</i>	<i>Unit</i>	<i>Limits</i>	
		<i>Minimum</i>	<i>Maximum</i>
Cetane number		51	-
Density at 15° C	kg/m ³	-	845
Distillation point: 95%	°C	-	360
Polycyclic aromatic hydrocarbons	% m/m	-	8
Sulphur content	mg/kg	-	10

B. Canada

12. Limit values for controlling emissions from fuels and mobile sources will be determined, as appropriate, taking into account information on available control technologies, limit values applied in other jurisdictions, and the documents below:

(a) Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations, SOR/2010–201;

(b) Marine Spark-Ignition Engine, Vessel and Off-Road Recreational Vehicle Emission Regulations, SOR/2011–10;

(c) Renewable Fuels Regulations, SOR/2010–189;

(d) Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals, SOR/2007–86;

(e) Off-Road Compression-Ignition Engine Emission Regulations, SOR/2005–32;

(f) On-Road Vehicle and Engine Emission Regulations, SOR/2003–2;

(g) Off-Road Small Spark-Ignition Engine Emission Regulations, SOR/2003–355;

(h) Sulphur in Diesel Fuel Regulations, SOR/2002–254;

(i) Gasoline and Gasoline Blend Dispensing Flow Rate Regulations SOR/2000–43;

(j) Sulphur in Gasoline Regulations, SOR/99–236;

(k) Benzene in Gasoline Regulations, SOR/97–493;

(l) Gasoline Regulations, SOR/90–247;

(m) Federal Mobile PCB Treatment and Destruction Regulations, SOR/90–5;

(n) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products;

(o) Canada-Wide Standards for Benzene, Phase 2;

(p) Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks. PN 1180;

(q) Environmental Code of Practice for Vapour Recovery in Gasoline Distribution Networks. PN 1057;

(r) Environmental Code of Practice for Light Duty Motor Vehicle Emission Inspection and Maintenance Programs — 2nd Edition. PN 1293;

(s) Joint Initial Actions to Reduce Pollutant Emissions that Contribute to Particulate Matter and Ground-level Ozone; and

(t) Operating and Emission Guidelines for Municipal Solid Waste Incinerators. PN 1085.

C. United States of America

13. Implementation of a mobile source emission control programme for light-duty vehicles, light-duty trucks, heavy-duty trucks and fuels to the extent required by sections 202 (a), 202 (g) and 202 (h) of the Clean Air Act, as implemented through:

(a) Registration of fuels and fuel additives — 40 C.F.R Part 79;

(b) Regulation of fuels and fuel additives — 40 C.F.R Part 80, including: Subpart A — general provisions; Subpart B — controls and prohibitions; Subpart D — reformulated gasoline; Subpart H — gasoline sulphur standards; Subpart I — motor vehicle diesel fuel; non-road, locomotive, and marine diesel fuel; and ECA marine fuel; Subpart L — gasoline benzene; and

(c) Control of emissions from new and in-use highway vehicles and engines — 40 C.F.R Part 85 and Part 86.

14. Standards for non-road engines and vehicles are specified in the following documents:

(a) Fuel sulphur standards for non-road diesel engines — 40 C.F.R Part 80, Subpart I;

(b) Aircraft engines — 40 C.F.R Part 87;

(c) Exhaust emission standards for non-road diesel engines — Tier 2 and 3; 40 C.F.R Part 89;

(d) Non-road compression-ignition engines — 40 C.F.R Part 89 and Part 1039;

(e) Non-road and marine spark-ignition engines — 40 C.F.R Part 90, Part 91, Part 1045, and Part 1054;

(f) Locomotives — 40 C.F.R Part 92 and Part 1033;

(g) Marine compression-ignition engines — 40 C.F.R Part 94 and Part 1042;

(h) New large non-road spark-ignition engines — 40 C.F.R Part 1048;

(i) Recreational engines and vehicles — 40 C.F.R Part 1051;

(j) Control of evaporative emissions from new and in-use non-road and stationary equipment — 40 C.F.R. Part 1060;

(k) Engine testing procedures — 40 C.F.R Part 1065; and

(l) General compliance provisions for non-road programs — 40 C.F.R Part 1068.

U. Annex IX

For annex IX the following text is substituted:

Measures for the control of emissions of ammonia from agricultural sources

1. This annex applies to Parties that are subject to obligations in article 3, paragraphs 8 (a) and (b), in accordance with the timescales established in annex VII.

Part A

2. This part of this annex describes the minimum measures for the control of ammonia emissions. These minimum measures can be reached by using the techniques for preventing and reducing ammonia emissions, according to the specifications listed in guidance adopted by the Executive Body.

3. When taking the minimum measures for the control of ammonia emissions, due account shall be taken of the need to reduce losses from the whole nitrogen cycle. Efforts shall be made to develop strategies for increasing nitrogen-use efficiency in crop and animal production. A high nitrogen-use efficiency is indicative for low nitrogen losses, low risk of pollution swapping and a high economic return on farm expenditure on nitrogen.

4. The provisions set out in paragraphs 10 to 18 apply to farms with more than 2,000 places for fattening pigs or 750 places for sows or 40,000 places for poultry.

5. All available on-farm nitrogen sources shall be assessed with the aim of ensuring the effective use of those sources in order to reduce emissions.

Advisory code of good agricultural practice

6. An advisory code of good agricultural practice to control ammonia emissions shall be established, published and disseminated, based on the Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions, adopted by the Executive Body at its nineteenth session (EB.AIR/WG.5/2001/7) and any amendment thereto. The advisory code shall take into account the specific conditions within the territory of the Party and shall include provisions on the following items:

- (a) Nitrogen management, taking into account the full nitrogen cycle;
- (b) Livestock feeding strategies;
- (c) Low-emission manure spreading approaches;
- (d) Low-emission manure storage systems;
- (e) Low-emission manure processing and composting systems;
- (f) Low-emission animal housing systems;
- (g) Possibilities for limiting ammonia emissions from the use of mineral fertilizers.

7. The advisory code shall be reviewed and, where necessary, updated at least every eight years and whenever the framework code is revised; it shall take into account the most recent insights and developments related to ammonia emissions

abatement. The code should be as far as feasible linked to or integrated within other codes of good agricultural practices describing good management of the overall nitrogen cycle.

Urea and ammonium carbonate fertilizers

8. The use of ammonium carbonate fertilizers shall be prohibited.
9. Steps shall be taken to limit ammonia emissions from the use of solid fertilizers based on urea as far as the Party in question considers them feasible. For field application of fertilizers based on urea, approaches should be used as listed in the guidance that have been shown to reduce ammonia emissions compared with the reference specified in the guidance, as far as the Party in question considers them applicable.

Livestock feeding strategies

10. Low-protein feeding strategies shall be used on all farms where animals are housed and where the diet is largely based on concentrate feed, as specified in the Guidance Document.

Animal housing

11. For animal housing, systems shall be used (as listed in the Guidance Document) that have been shown to reduce emissions as specified in table 1 below.

Table 1

Ammonia emission reduction requirements for animal housing

<i>Category</i>	<i>Minimum emission reduction compared with the reference^a</i>	<i>Exemptions/conditions</i>
Existing pig and poultry housing	15%	
New or largely rebuilt pig housing ^b	20% for mating/gestating sows 25% for growers/finishers 50% for farrowing sows 25% for weaners	
New and largely rebuilt broiler housing ^b	20%	Includes chicken, turkeys, geese and other poultry
New and largely rebuilt layer housing ^b	40%	30% for areas with a Mediterranean climate ^c

^a The reference specified is that listed in the guidance.

^b Where the housing on a farm installation covers more than one stage of pig rearing then the lowest emission reduction figure shall apply to the installation as a whole.

^c A type of climate characterized by hot, dry, sunny summers and a winter rainy season.

Manure storage outside of animal houses

12. For new slurry stores outside of animal houses, low-emission storage systems or techniques shall be used that have been shown to reduce ammonia emissions by 40 per cent or more compared with the reference, as listed in the guidance.
13. For existing slurry stores on farms, low-emission storage systems or techniques shall be used that have been shown to reduce ammonia emissions by 40

per cent as compared with the reference described in the guidance. For existing very large lagoons, ammonia emission reductions of 40 per cent should be achieved, as far as the Party considers it technically and economically feasible.

14. For existing and new stores for solid manure, low-emission storage systems such as described in the guidance should be used, so far as the Party considers them technically and economically feasible.

15. As far as technically and economically feasible, all livestock farms should have sufficient manure storage capacity to allow manure to be applied at times most suitable for crop growth.

Manure processing and composting

16. Whenever manure-processing and composting systems are used, these should be low-emission systems, as far as a Party considers it is feasible.

Manure application

17. For slurry and solid manure application, approaches shall be used as listed in the guidance that have been shown to reduce emissions as specified in table 2 below. This provision applies to the land application of slurry and solid manure from the farms described in paragraph 4 to both arable land and grassland as far as a Party considers them applicable, taking account of local soil and geomorphological conditions and farm structure.

18. Solid manure applied to land to be ploughed shall be incorporated within 12 hours of spreading as far as a Party considers this measure applicable, taking account of local soil and geomorphological conditions and farm structure.

Table 2

Ammonia emission reduction requirements for slurry and solid manure application to arable land and grassland

<i>Category</i>	<i>Minimum emission reduction compared with the reference^a</i>	<i>Exemptions/conditions</i>
For slurry application to arable land and grassland and for solid manure application to bare soil	To use methods that reduce emissions by at least 30% compared with the reference method	Use of small spreaders ^b A relaxation applies for application to grassland where the grass height is greater than 10 cm
For solid manure application only to arable crops before sowing	To use methods that reduce emissions by at least 30% compared with the reference method	

^a The reference specified is that listed in the guidance.

^b When using existing mobile slurry tankers and solid manure spreaders having less than 3m³ capacity, this requirement applies only as far as the Party considers it feasible.

19. For farm installations not covered by paragraph 4, low-emission slurry application techniques (as listed in the guidance) that have been shown to reduce emissions by at least 30 per cent compared with the reference specified in that guidance shall be used as far as the Party in question considers them applicable, taking account of local soil and geomorphological conditions, slurry type and farm structure.

Part B (recommendatory)

20. The provisions laid out in this part of this annex describe the minimum measures that can be undertaken as far as the Party in question considers them applicable for the control of ammonia emissions.

National nitrogen budgets and farm-level balances

21. National nitrogen budgets for agriculture should be established as far as is technically feasible, based on available statistics every five years in order to monitor the changes in overall losses of reactive nitrogen from agriculture, including emissions of ammonia and nitrous oxide to air and the leaching of N to groundwater and surface water.

22. Farm-level input-output balances can be established on all farms. These input-output balances can be used to show a relative improvement until a level of high efficiency is achieved, as specified in the guidance.

Ammonium sulphate and ammonium phosphate based fertilizers

23. For fertilizers based predominantly on ammonium sulphate or ammonium phosphate, when applied to calcareous soils approaches can be used as listed in the guidance that have been shown to reduce mean ammonia emissions as compared with the reference specified in the guidance.

Measures for the control of ammonia emissions from cattle farms

24. Recognizing that cattle farms [with greater than 50 animals] are a significant source of ammonia emissions, Parties are recommended to take the following priority measures, as listed in paragraphs 25 to 31, on such farms on the basis of the measures identified in the guidance.

Livestock feeding strategies

25. Low-protein feeding strategies should be used on all farms where animals are housed and where the diet is largely based on concentrate feed as specified in the guidance.

Animal housing

26. For animal housing, systems can be used as listed in the guidance that have been shown to reduce emissions compared with the reference specified in the guidance. Measures should be targeted in particular towards new or largely rebuilt housing.

Manure storage outside of animal houses

27. For slurry stores and very large lagoons outside of animal houses, low-emission storage systems or techniques should be used that have been shown to reduce ammonia emissions compared with the reference specified in the guidance.

28. For existing and new stores for solid manure, low-emission storage systems such as described in the guidance should be used, so far as the Party considers them technically and economically feasible.

29. As far as technically and economically feasible, all livestock farms should have sufficient manure storage capacity to allow manure to be applied at times most suitable for crop growth.

Manure processing and composting

30. Whenever manure-processing and composting systems are used, these should be low-emission systems, as far as it is considered feasible.

Manure application

31. Solid manure applied to land to be ploughed should be incorporated within 12 hours of spreading, as far as a Party considers this measure applicable, taking account of local soil and geomorphological conditions and farm structure.

V. Annex X

A new annex X is added as follows:

Annex X
Limit values for emissions of [total suspended particulates] [dust] [particulate matter] from stationary sources

1. Section A applies to Parties other than Canada and the United States of America, section B applies to Canada and section C applies to the United States of America.

A. Parties other than Canada and the United States of America

[2. In this section only, emission limit values are expressed in terms of “dust”, total particulate matter or “total suspended particulate matter” (TSP). TSP or dust means 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.]¹⁵

3. For the purpose of this section, “emission limit value” (ELV) means the quantity of dust contained in the waste gases from an installation that is not to be exceeded. 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 waste 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 via measurements or through calculations achieving at least the same accuracy. Compliance with limit values shall be verified through continuous or discontinuous measurements, type approval, or any other technically sound method including verified calculation methods. In case of continuous measurements, compliance with the limit value is achieved if the validated monthly emission average does not exceed the ELV. In case of discontinuous measurements or other appropriate determination or calculation

¹⁵ Proposal by the United States.

procedures, compliance with the ELVs 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 measurement methods may be taken into account for verification purposes.

5. Monitoring of relevant polluting substances and measurements of process parameters, as well as the quality assurance of automated measuring systems and the reference measurements 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.

6. Special provisions for combustion plants referred to in paragraph 7:

6.1 The competent authority may grant derogation from the obligation to comply with the ELVs provided for in paragraph 7 in the following cases:

[(a) For combustion plants normally using gaseous fuel which 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];

[(b) For existing combustion plants not operated more than 17,500 operating hours, starting from 1 January 2016 and ending no later than 31 December 2023.]

6.2 Where a combustion plant is extended by at least 50 MWth, the ELV specified in paragraph 7 for new installations shall apply to the extensional part affected by the change. The ELV is calculated as an average weighted by the *actual* thermal input for both the existing and the new part of the plant.

6.3 Parties shall ensure that provisions are made in the permits for procedures relating to malfunction or breakdown of the abatement equipment.

6.4 In the case of a multi-fuel firing combustion plant involving the simultaneous use of two or more fuels, the competent authority shall determine the ELV as the weighted average of the ELVs for the individual fuels, on the basis of the thermal input delivered by each fuel.

7. Combustion plants with a rated thermal input exceeding 50 MWth:¹⁶

Table 1
Limit values for dust emissions from combustion plants^{a/}

<i>Fuel type</i>	<i>Thermal input [(MWth)]</i>	<i>ELV for dust (mg/m³)</i> ^{b/}	
		<i>Option 2</i>	<i>Option 3</i>
Solid fuels	50–100	New plants:	
		20 (coal, lignite and other solid fuels)	
		20 (biomass, peat)	
		Existing plants:	[Existing plants:
	30 (coal, lignite and other solid fuels)	50 (coal, lignite)	
	30 (biomass, peat)	50 (biomass, peat) – delete]	
100–300	New plants:	20 (coal, lignite and other solid fuels)	
		20 (biomass, peat)	
		Existing plants:	[Existing plants:
	25 (coal, lignite and other solid fuels)	50 (coal, lignite)	
	20 (biomass, peat)	50 (biomass, peat) – delete]	
>300	New plants:	10 (coal, lignite and other solid fuels)	
		20 (biomass, peat)	
		Existing plants:	[Existing plants:
	20 (coal, lignite and other solid fuels)	50 (coal, lignite)	
	20 (biomass, peat)	50 (biomass, peat) – delete]	
Liquid fuels	50–100	New plants:	
		20	
		Existing plants:	50
	30 (in general)	for the firing of distillation and conversion residues within refineries from the refining of crude oil for own consumption in combustion plants	

¹⁶ The rated thermal input of the combustion plant is calculated as the sum of the input of all units connected to a common stack. Individual units below 15 MWth shall not be considered when calculating the total rated thermal input.

Fuel type	Thermal input [(MWh)]	ELV for dust (mg/m ³) ^{b/}	
		Option 2	Option 3
Liquid fuels	100–300	New plants: 20	
		Existing plants: 25 (in general)	50 for the firing of distillation and conversion residues within refineries from the refining of crude oil for own consumption in combustion plants
	>300	New plants: 10	
		Existing plants: 20 (in general)	50 for the firing of distillation and conversion residues within refineries from the refining of crude oil for own consumption in combustion plants
Natural gas	> 50	5	
Other gases	> 50	10	
		30 for gases produced by the steel industry which can be used elsewhere	

^{a/} In particular, the ELVs shall not apply to:

- Plants in which the products of combustion are used for direct heating, drying, or any other treatment of objects or materials;
- Post-combustion plants designed to purify the waste gases by combustion which are not operated as independent combustion plants;
- Facilities for the regeneration of catalytic cracking catalysts;
- Facilities for the conversion of hydrogen sulphide into sulphur;
- Reactors used in the chemical industry;
- Coke battery furnaces;
- Cowpers;
- [- Recovery boilers within installations for the production of pulp;]
- Waste incinerators; and
- Plants powered by diesel, petrol or gas engines or by combustion turbines, irrespective of the fuel used.

^{b/} The O₂ reference content is 6% for solid fuels and 3% for liquid and gaseous fuels.

8. Mineral oil and gas refineries:

Table 2

Limit values for dust emissions released from mineral oil and gas refineries

<i>Emission source</i>	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
FCC regenerators	50	

9. Cement clinker production:

Table 3

Limit values for dust emissions released from cement production^{a/}

	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
Cement installations, kilns, mills and clinker coolers	20	[50 – delete]

^{a/} Installations for the production of cement clinker in rotary kilns with a capacity >500 Mg/day or in other furnaces with a capacity >50 Mg/day. The reference oxygen content is 10 %.

10. Lime production:

Table 4

Limit values for dust emissions released from lime production^{a/}

	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
Lime kiln firing	20 ^{b/}	[30 – delete]

^{a/} Installations for the production of lime with a capacity of 50 Mg/day or more. This includes lime kilns integrated in other industrial processes, with the exception of the pulp industry (see table [9]). The reference oxygen content is 11%.

^{b/} Where the resistivity of the dust is high, the ELV may be higher, up to 30 mg/Nm³.

11. Production and processing of metals:

Table 5

Limit values for dust emissions released from primary iron and steel production

<i>Activity and capacity threshold</i>	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
Sinter plant		
Pelletization plant	20 for crushing, grinding and drying	
	15 for all other process steps	

<i>Activity and capacity threshold</i>	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
Blast furnace: Hot stoves (>2.5 t/hour)	10	[50 – delete]
Basic oxygen steelmaking and casting (>2.5 t/hour)	30	[50 – delete]
Electric steelmaking and casting (>2.5 t/hour)	15 (existing) 5 (new)	

Table 6
Limit values for dust emissions released from iron foundries

<i>Activity and capacity threshold</i>	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
Iron foundries (>20 t/day): - all furnaces (cupola, induction, rotary) - all mouldings (lost, permanent)	20	[50 – delete]
Hot and cold rolling	20	
	50 where a bag filter cannot be applied due to the presence of wet fumes	

Table 7
Limit values for dust emissions released from non-ferrous metals production and processing

	<i>ELV for dust (mg/m³) [(daily)]</i>	
	<i>Option 2</i>	
Non-ferrous metal processing	20	

12. Glass production:

Table 8
Limit values for dust emissions released from glass production^{a/}

	<i>ELV for dust (mg/m³)</i>	
	<i>Option 2</i>	
New installations	20	
Existing installations	30	[50 – delete]

^{a/} Installations for the production of glass or glass fibres with a capacity of 20 Mg/day or more. Concentrations refer to dry waste gases at 8% oxygen by volume (continuous melting), 13% oxygen by volume (discontinuous melting).

13. Pulp production:

Table 9

Limit values for dust emissions released from pulp production

	<i>ELV for dust (mg/m³) (annual averages)</i>
	<i>Option 2</i>
Auxiliary boiler	40 when firing liquid fuels (at 3% oxygen content) 30 when firing solid fuels (at 6% oxygen content)
Recovery boiler and lime kiln	50

14. Waste incineration:

Table 10

Limit values for dust emissions released from waste incineration

	<i>ELV for dust (mg/m³)</i>
	<i>Option 3</i>
Municipal waste incineration plants (> 3 Mg/hour)	10
Hazardous and medical waste incineration (> 1 Mg/hour)	10

Note: Oxygen reference: dry basis, 11%.

15. Titanium dioxide production:

Table 11

Limit values for dust emissions released from titanium dioxide production

	<i>ELV for dust (mg/m³)</i>
	<i>Option 3</i>
Sulphate process, total emission	50
Chloride process, total emission	50

Note: For minor emission sources within an installation, an ELV of 150 mg/m³ may be applied.

16.^{17,18} Small combustion installations with a rated thermal input < 50 MWth:

16.1 Small combustion installations with a rated thermal input < [300] [500] kWth:

(a) Emissions from new residential combustion stoves and boilers with a rated thermal input < [300] [500] kWth can be reduced by the application of:

(i) Product standards as described in CEN standards (e.g., EN 303–5) and equivalent product standards in the United States and Canada. Countries applying such product standards may define additional national requirements taking into account, in particular, the contribution of emissions of condensable organic compounds to the formation of ambient PM;

(ii) Ecolabels specifying performance criteria that are typically stricter than the minimum efficiency requirements of the EN product standards or national regulations;

Table 12

Limit values for dust emissions released from new small wood combustion installations with a rated thermal input < [300] [500] kWth to be used with product standards

(O₂ reference content: 13%)

<i>Dust (mg/m³)</i>	<i>Option 2</i>	<i>Option 3</i>
Open/closed fireplaces	75	110
Wood stoves	75	110
Log wood boilers (with heat storage tank)	40	110
Pellet stoves and boilers	40	110
Automatic combustion plants	50	110

^{a/} Table 12 recommends options for additional ELVs for dust for wood combustion appliances.

(b) Emissions from existing residential combustion stoves and boilers can be reduced by the following primary measures:

(i) By public information and awareness-raising programmes regarding:

- a. The proper operation of stoves and boilers;
- b. The use of untreated wood only;
- c. The correct seasoning of wood for moisture content;

(ii) By establishing a programme to promote the replacement of the oldest existing boilers and stoves by modern appliances; or

(iii) By establishing an obligation to exchange or retrofit old appliances.

¹⁷ The EU proposes to move paragraph 15 into a separate annex or separate part of this annex, with a non-mandatory character and to select one option, which could be in the ambitious range (1 to 2) as a recommendation.

¹⁸ Belarus believes that further clarification is required to ensure consistency between the figures in tables 12 and 13 with regard to wood burning stoves. Furthermore, the figures proposed in tables 12 and 14 under both options 2 and 3 are considered to be too ambitious.

16.2 Combustion installations with a rated thermal input [50] [70] [100] kWth–1 MWth:

Table 13

Limit values for dust emissions released from boilers [and process heaters] with a rated thermal input of [50] [70] [100] kWth–1 MWth. (O₂ reference content: wood, other solid biomass and peat: 13%; coal, lignite and other fossil solid fuels: 6%)

<i>Dust (mg/m³)</i>		<i>Option 2</i>	<i>Option 3</i>
Solid fuels [50][70][100]–500 kWth	New installations	50	150
	Existing installations	150	150
Solid fuels 500 kWth–1 MWth	New installations	50	150
	Existing installations	150	150

16.3 Combustion installations with a rated thermal input > 1–50 MWth:

Table 14

Limit values for dust emissions released from boilers [and process heaters] with a rated thermal input of 1 MWth–50 MWth (O₂ reference content: Wood, other solid biomass and peat: 11%; Coal, lignite and other fossil solid fuels: 6%; Liquid fuels, including liquid biofuels: 3%)

<i>Dust (mg/m³)</i>		<i>Option 2</i>	<i>Option 3</i>
Solid fuels > 1–5 MWth	New installations	20	150
	Existing installations	50	150
Solid fuels > 5–50 MWth	New installations	20	50
	Existing installations	30	50
Liquid fuels > 1–5 MWth	New installations	20	150
	Existing installations	50	150
Liquid fuels >5-50 MWth	New installations	20	50
	Existing installations	30	50

B. Canada

17. Limit values for controlling emissions of PM will be determined for stationary sources, as appropriate, taking into account information on available control technologies, limit values applied in other jurisdictions and the documents listed in subparagraphs (a) to (h) below. Limit values may be expressed in terms of PM or TPM. TPM in this context means any PM with an aerodynamic diameter of less than 100 µm.

- (a) Secondary Lead Smelter Release Regulations, SOR/91-155;
- (b) Environmental Code of Practice for Base Metals Smelters and Refineries;
- (c) New Source Emission Guidelines for Thermal Electricity Generation;

- (d) Environmental Code of Practice for Integrated Steel Mills (EPS 1/MM/7);
- (e) Environmental Code of Practice for Non-Integrated Steel Mills (EPS 1/MM/8);
- (f) Emission Guidelines for Cement Kilns. PN 1284;
- (g) Joint Initial Actions to Reduce Pollutant Emissions that Contribute to Particulate Matter and Ground-level Ozone; and
- (h) Performance testing of solid-fuel-burning heating appliances, Canadian Standards Association, B415. 1-10.]

C. United States of America

18. Limit values for controlling emissions of PM from new stationary sources in the following stationary source categories are specified in the following documents:

- (a) Steel Plants: Electric Arc Furnaces — 40 C.F.R. Part 60, Subpart AA and Subpart AAa;
- (b) Small Municipal Waste Combustors — 40 C.F.R. Part 60, Subpart AAAA;
- (c) Kraft Pulp Mills — 40 C.F.R. Part 60, Subpart BB;
- (d) Glass Manufacturing — 40 C.F.R. Part 60, Subpart CC;
- (e) Electric Utility Steam Generating Units — 40 C.F.R. Part 60, Subpart D and Subpart Da;
- (f) Industrial-Commercial-Institutional Steam Generating Units — 40 C.F.R. Part 60, Subpart Db and Subpart Dc;
- (g) Grain Elevators — 40 C.F.R. Part 60, Subpart DD;
- (h) Municipal Waste Incinerators — 40 C.F.R. Part 60, Subpart E, Subpart Ea and Subpart Eb;
- (i) Hospital/Medical/Infectious Waste Incinerators — 40 C.F.R. Part 60, Subpart Ec;
- (j) Portland Cement — 40 C.F.R. Part 60, Subpart F;
- (k) Lime Manufacturing — 40 C.F.R. Part 60, Subpart HH;
- (l) Hot Mix Asphalt Facilities — 40 C.F.R. Part 60, Subpart I;
- (m) Stationary Internal Combustion Engines: Compression Ignition — 40 C.F.R. Part 60, Subpart IIII;
- (n) Petroleum Refineries — 40 C.F.R. Part 60, Subpart J and Subpart Ja;
- (o) Secondary Lead Smelters — 40 C.F.R. Part 60, Subpart L;
- (p) Metallic Minerals Processing — 40 C.F.R. Part 60, Subpart LL;
- (q) Secondary Brass and Bronze — 40 C.F.R. Part 60, Subpart M;
- (r) Basic Oxygen Process Furnaces — 40 C.F.R. Part 60, Subpart N;
- (s) Basic Process Steelmaking Facilities — 40 C.F.R. Part 60, Subpart Na;

- (t) Phosphate Rock Processing — 40 C.F.R. Part 60, Subpart NN;
 - (u) Sewage Treatment Plant Incineration — 40 C.F.R. Part 60, Subpart O;
 - (v) Nonmetallic Minerals Processing Plants — 40 C.F.R. Part 60, Subpart OOO;
 - (w) Primary Copper Smelters — 40 C.F.R. Part 60, Subpart P;
 - (x) Ammonium Sulfate Manufacturing — 40 C.F.R. Part 60, Subpart PP;
 - (y) Wool Fiberglass Insulation — 40 C.F.R. Part 60, Subpart PPP;
 - (z) Primary Zinc Smelters — 40 C.F.R. Part 60, Subpart Q;
 - (aa) Primary Lead Smelters — 40 C.F.R. Part 60, Subpart R;
 - (bb) Primary Aluminum reduction plants — 40 C.F.R. Part 60, Subpart Subpart S;
 - (cc) Phosphate Fertilizer Production — 40 C.F.R. Part 60, Subparts T, U, V, W, X;
 - (dd) Asphalt Processing and Asphalt Roofing Manufacturing — 40 C.F.R. Part 60, Subpart UU;
 - (ee) Calciners and Dryers in Mineral Industries — 40 C.F.R. Part 60, Subpart UUU;
 - (ff) Coal Preparation Plants — 40 C.F.R. Part 60, Subpart Y;
 - (gg) Ferroalloy Production Facilities — 40 C.F.R. Part 60, Subpart Z;
 - (hh) Residential Wood Heaters — 40 C.F.R. Part 60, Subpart AAA;
 - (ii) Small Municipal Waste Combustors (after 11/30/1999) — 40 C.F.R. Part 60, Subpart AAAA;
 - (jj) Small Municipal Waste Combustors (before 11/30/1999) — 40 C.F.R. Part 60, Subpart BBBB;
 - (kk) Other Solid Waste Incineration Units (after 12/9/2004) — 40 C.F.R. Part 60, Subpart EEEE;
 - (ll) Other Solid Waste Incineration Units (before 12/9/2004) — 40 C.F.R. Part 60, Subpart FFFF
 - (mm) Stationary Compression Ignition Internal Combustion Engines — 40 C.F.R. Part 60, Subpart IIII;
 - (nn) Lead Acid Battery Manufacturing Plants — 40 C.F.R. Part 60, Subpart KK.
19. Limit values for controlling emissions of PM from new and existing sources subject to National Emission Standards for Hazardous Air Pollutants:
- (a) Coke oven batteries — 40 C.F.R. Part 63, Subpart L;
 - (b) Chrome Electroplating (major and Area sources) — 40 C.F.R. Part 63, Subpart N;
 - (c) Secondary lead smelters — 40 C.F.R. Part 63, Subpart X;
 - (d) Phosphoric Acid Manufacturing Plants — 40 C.F.R. Part 63, Subpart AA;
 - (e) Phosphate Fertilizers Production Plants — C.F.R. Part 63, Subpart BB

- (f) Magnetic Tape Manufacturing — 40 C.F.R. Part 63, Subpart EE;
- (g) Primary Aluminum— 40 C.F.R. Part 63, Subpart L;
- (h) Pulp and paper II (combustion) — C.F.R. Part 63, Subpart MM;
- (i) Mineral wool manufacturing — C.F.R. Part 63, Subpart DDD;
- (j) Hazardous waste combustors — C.F.R. Part 63, Subpart EEE;
- (k) Portland cement manufacturing — C.F.R. Part 63, Subpart LLL;
- (l) Wool fiberglass manufacturing — 40 C.F.R. Part 63, Subpart NNN;
- (m) Primary copper — 40 C.F.R. Part 63, Subpart QQQ;
- (n) Secondary aluminum — 40 C.F.R. Part 63, Subpart RRR;
- (o) Primary lead smelting — 40 C.F.R. Part 63, Subpart TTT;
- (p) Petroleum refineries — 40 C.F.R. Part 63, Subpart UUU;
- (q) Ferroalloys production — 40 C.F.R. Part 63, Subpart XXX;
- (r) Lime manufacturing — 40 C.F.R. Part 63, Subpart AAAAAA;
- (s) Coke Ovens: Pushing, Quenching, and Battery Stacks — 40 C.F.R. Part 63, Subpart CCCCC;
- (t) Iron and steel foundries — 40 C.F.R. Part 63, Subpart EEEEE;
- (u) Integrated iron and steel manufacturing — 40 C.F.R. Part 63, Subpart FFFFF;
- (v) Site remediation — 40 C.F.R. Part 63, Subpart GGGGG;
- (w) Miscellaneous coating manufacturing — 40 C.F.R. Part 63, Subpart HHHHH;
- (x) Asphalt Processing and Roofing Manufacturing — 40 C.F.R. Part 63, Subpart LLLLL;
- (y) Taconite Iron Ore Processing — 40 C.F.R. Part 63, Subpart RRRRR;
- (z) Refractory products manufacturing — 40 C.F.R. Part 63, Subpart SSSSS;
- (aa) Primary magnesium refining — 40 C.F.R. Part 63, Subpart TTTTT;
- (bb) Electric Arc Furnace Steelmaking Facilities — 40 C.F.R. Part 63, Subpart YYYYY;
- (cc) Iron and steel foundries — 40 C.F.R. Part 63, Subpart ZZZZZ;
- (dd) Primary Copper Smelting Area Sources — 40 C.F.R. Part 63, Subpart EEEEE;
- (ee) Secondary Copper Smelting Area Sources — 40 C.F.R. Part 63, Subpart FFFFF;
- (ff) Primary Nonferrous Metals Area Sources: Zinc, Cadmium, and Beryllium — 40 C.F.R. Part 63, Subpart GGGGG;
- (gg) Lead Acid Battery Manufacturing (Area sources) — 40 C.F.R. Part 63, Subpart PPPPP;
- (hh) Glass manufacturing (area sources) — 40 C.F.R. Part 63, Subpart SSSSS;

- (ii) Secondary Nonferrous Metal Smelter (Area Sources) — 40 C.F.R. Part 63, Subpart TTTTTT;
- (jj) Chemical Manufacturing (Area Sources) — 40 C.F.R. Part 63, Subpart VVVVVV;
- (kk) Plating and Polishing Operations (Area sources) — 40 C.F.R. Part 63, Subpart WWWWWW;
- (ll) Area Source Standards for Nine Metal Fabrication and Finishing Source Categories — 40 C.F.R. Part 63, Subpart XXXXXX;
- (mm) Ferroalloys Production (Area Sources) — 40 C.F.R. Part 63, Subpart YYYYYY;
- (nn) Aluminum, Copper, and Nonferrous Foundries (Area Sources) — 40 C.F.R. Part 63, Subpart ZZZZZZ;
- (oo) Asphalt Processing and Roofing Manufacturing (Area Sources) — 40 C.F.R. Part 63, Subpart AAAAAA;
- (pp) Chemical Preparation (Area Sources) — 40 C.F.R. Part 63, Subpart BBBB BB;
- (qq) Paints and Allied Products Manufacturing (Area Sources) — 40 C.F.R. Part 63, Subpart CCCCCC;
- (rr) Prepared animal feeds manufacturing (Area Sources) — 40 C.F.R. Part 63, Subpart DDDDDDD; and
- (ss) Gold Mine Ore Processing and Production (Area) (Area Sources) — 40 C.F.R. Part 63, Subpart EEEEEEE.

W. Annex XI

A new annex XI is added as follows:

Annex XI
Limit values for volatile organic compounds content of products

1. Section A applies to Parties other than Canada and the United States of America, section B applies to Canada and section C applies to the United States of America.

A. Parties other than Canada and the United States of America

2. This section concerns the limitation of emissions of volatile organic compounds (VOCs) due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products.

3. For the purpose of section A of the present annex, the following general definitions shall apply:

(a) “Substances” means any chemical element and its compounds, as they occur in the natural state or as produced by industry, whether in solid or liquid or gaseous form;

(b) "Mixture" means mixtures or solutions composed of two or more substances;

(c) "Organic compound" means any compound containing at least the element carbon and one or more of hydrogen, oxygen, sulphur, phosphorus, silicon, nitrogen, or a halogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates;

(d) "Volatile organic compound (VOC)" means any organic compound having an initial boiling point less than or equal to 250° C measured at a standard pressure of 101.3 kPa;

(e) "VOC content" means the mass of VOCs, expressed in grams/litre (g/l), in the formulation of the product in its ready to use condition. The mass of VOCs in a given product which react chemically during drying to form part of the coating shall not be considered part of the VOC content;

(f) "Organic solvent" means any VOC which is used alone or in combination with other agents to dissolve or dilute raw materials, products, or waste materials, or is used as a cleaning agent to dissolve contaminants, or as a dispersion medium, or as a viscosity adjuster, or as a surface tension adjuster, or as a plasticiser, or as a preservative;

(g) "Coating" means any mixture, including all the organic solvents or mixtures containing organic solvents necessary for its proper application, which is used to provide a film with decorative, protective or other functional effect on a surface;

(h) "Film" means a continuous layer resulting from the application of one or more coats to a substrate;

(i) "Water-borne coatings (WB)" means coatings the viscosity of which is adjusted by the use of water;

(j) "Solvent-borne coatings (SB)" means coatings the viscosity of which is adjusted by the use of organic solvent;

(k) "Placing on the market" means making available to third parties, whether in exchange for payment or not. Importation into the Parties customs territory shall be deemed to be placing on the market for the purposes of this annex.

4. "Paints and varnishes" means products listed in the subcategories below, excluding aerosols. They are coatings applied to buildings, their trim and fitting, and associated structures for decorative, functional and protective purpose:

(a) "Matt coatings for interior walls and ceilings" means coatings designed for application to indoor walls and ceilings with a gloss $\leq 25 @ 60$ degrees;

(b) "Glossy coatings for interior walls and ceilings" means coatings designed for application to indoor walls and ceilings with a gloss $> 25 @ 60$ degrees;

(c) "Coatings for exterior walls of mineral substrate" means coatings designed for application to outdoor walls of masonry, brick or stucco;

(d) "Interior/exterior trim and cladding paints for wood, metal or plastic" means coatings designed for application to trim and cladding which produce an opaque film. These coatings are designed for either a wood, metal or a plastic substrate. This subcategory includes undercoats and intermediate coatings;

(e) “Interior/exterior trim varnishes and wood stains” means coatings designed for application to trim which produce a transparent or semi-transparent film for decoration and protection of wood, metal and plastics. This subcategory includes opaque wood stains. Opaque wood stains means coatings producing an opaque film for the decoration and protection of wood, against weathering, as defined in EN 927-1, within the semi-stable category;

(f) “Minimal build wood stains” means wood stains which, in accordance with EN 927-1:1996, have a mean thickness of less than 5µm when tested according to ISO 2808: 1997, method 5A;

(g) “Primers” means coatings with sealing and/or blocking properties designed for use on wood or walls and ceilings;

(h) “Binding primers” means coatings designed to stabilize loose substrate particles or impart hydrophobic properties and/or to protect wood against blue stain;

(i) “One-pack performance coatings” means performance coatings based on film-forming material. They are designed for applications requiring a special performance, such as primer and topcoats for plastics, primer coat for ferrous substrates, primer coat for reactive metals such as zinc and aluminium, anticorrosion finishes, floor coatings, including for wood and cement floors, graffiti resistance, flame retardant, and hygiene standards in the food or drink industry or health services;

(j) “Two-pack performance coatings” means coatings with the same use as one-performance coatings, but with a second component (e.g., tertiary amines) added prior to application;

(k) “Multicoloured coatings” means coatings designed to give a two-tone or multiple-colour effect, directly from the primary application;

(l) “Decorative effect coatings” means coatings designed to give special aesthetic effects over specially prepared pre-painted substrates or base coats and subsequently treated with various tools during the drying period.

5. “Vehicle refinishing products” means products listed in the subcategories below. They are used for the coating of road vehicles, or part of them, carried out as part of vehicle repair, conservation or decoration outside of manufacturing installations. In this respect, “road vehicle” means any motor vehicle intended for use on the road, being complete or incomplete, having at least four wheels and a maximum design speed exceeding 25 km/h, and its trailers, with the exception of vehicles which run on rails and of agricultural and forestry tractors and all mobile machinery:

(a) “Preparatory and cleaning” means products designed to remove old coatings and rust, either mechanically or chemically, or to provide a key for new coatings:

(i) Preparatory products include gunwash (a product designed for cleaning spray-guns and other equipment), paint strippers, degreasers (including anti-static types for plastic) and silicone removers;

(ii) “Pre-cleaner” means a cleaning product designed for the removal of surface contamination during preparation for and prior to the application of coating materials;

(b) “Bodyfiller/stopper” means heavy-bodied compounds designed to be applied to fill deep surface imperfections prior to the application of the surfacer/filler;

(c) “Primer” means any coating that is designed for application to bare metal or existing finishes to provide corrosion protection prior to application of a primer surfacer:

(i) “Surfacer/filler” means a coating designed for application immediately prior to the application of topcoat for the purpose of corrosion resistance, to ensure adhesion of the topcoat, and to promote the formation of a uniform surface finish by filling in minor surface imperfections;

(ii) “General metal primer” means a coating designed for application as primers, such as adhesion promoters, sealers, surfacers, undercoats, plastic primers, wet-on-wet, non-sand fillers and spray fillers;

(iii) “Wash primer” means coatings containing at least 0.5% by weight of phosphoric acid designed to be applied directly to bare metal surfaces to provide corrosion resistance and adhesion; coatings used as weldable primers; and mordant solutions for galvanized and zinc surfaces;

(d) “Topcoat” means any pigmented coating that is designed to be applied either as a single-layer or as a multiple-layer base to provide gloss and durability. It includes all products involved such as base coatings and clear coatings:

(i) “Base coatings” means pigmented coatings designed to provide colour and any desired optical effects, but not the gloss or surface resistance of the coating system;

(ii) “Clear coating” means a transparent coating designed to provide the final gloss and resistance properties of the coating system;

(e) “Special finishes” means coatings designed for application as topcoats requiring special properties, such as metallic or pearl effect, in a single layer, high-performance solid-colour and clear coats, (e.g., anti-scratch and fluorinated clear coat), reflective base coat, texture finishes (e.g., hammer), anti-slip, under-body sealers, anti-chip coatings, interior finishes; and aerosols.

6. Parties shall ensure that the products covered by this annex which are placed on the market within their territory comply with the maximum VOC content as specified in tables 1 and 2. For the purposes of restoration and maintenance of buildings and vintage vehicles designated by competent authorities as being of particular historical and cultural value, Parties may grant individual licences for the sale and purchase in strictly limited quantities of products which do not meet the VOC limit values laid down in this annex. Parties may also exempt from compliance with the above requirements products sold for exclusive use in an activity covered by annex VI and carried out in a registered or authorized installation complying with that annex.

Table 1
Maximum VOC content for paints and varnishes

<i>Product subcategory</i>	<i>Type</i>	<i>(g/l)*</i>
Interior matt wall and ceilings (Gloss \leq 25@60°)	WB	30
	SB	30
Interior glossy walls and ceilings (Gloss $>$ 25@60°)	WB	100
	SB	100
Exterior walls of mineral substrate	WB	40
	SB	430
Interior/exterior trim and cladding paints for wood and metal	WB	130
	SB	300
Interior/exterior trim varnishes and wood stains, including opaque wood stains	WB	130
	SB	400
Interior and exterior minimal build wood stains	WB	130
	SB	700
Primers	WB	30
	SB	350
Binding primers	WB	30
	SB	750
One pack performance coatings	WB	140
	SB	500
Two-pack reactive performance coatings for specific end-use	WB	140
	SB	500
Multi-coloured coatings	WB	100
	SB	100
Decorative effects coatings	WB	200
	SB	200

* g/l ready to use.

Table 2
Maximum VOC content for vehicle refinishing products

<i>Product Subcategory</i>	<i>Coatings</i>	<i>VOC (g/l)*</i>
Preparatory and cleaning	Preparatory	850
	Pre-cleaner	200
Bodyfiller/stopper	All types	250
Primer	Surfacer/filler and general (metal) primer	540
	Wash primer	780
Topcoat	All types	420
Special finishes	All types	840

* g/l of ready-for-use product. Except for “preparatory and cleaning”, any water content of the product ready for use should be discounted.

B. Canada

7. Limit values for controlling emissions of VOCs from the use of consumer and commercial products will be determined, as appropriate, taking into account information on available control technologies, techniques and measures, limit values applied in other jurisdictions, and the documents below:

(a) VOC Concentration Limits for Architectural Coatings Regulations, SOR/2009-264;

(b) VOC Concentration Limits for Automotive Refinishing Products, SOR/2009-197;

(c) Regulations Amending the Prohibition of Certain Toxic Substances Regulations, 2005 (2-Methoxyethanol, Pentachlorobenzene and Tetrachlorobenzenes), SOR/2006-279;

(d) Federal Halocarbon Regulations, SOR/2003-289;

(e) Prohibition of Certain Toxic Substances Regulations, SOR/2003-99;

(f) Solvent Degreasing Regulations, SOR/2003-283;

(g) Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations, SOR/2003-79;

(h) Order Adding Toxic Substances to Schedule 1 to the Canadian Environmental Protection Act, 1999;

(i) Notice with Respect to Certain Substances on the Domestic Substances List (DSL);

(j) Order Amending Schedule 1 to the Canadian Environmental Protection Act, 1999 (Miscellaneous Program);

(k) Ozone-depleting Substances Regulations, SOR/99-7;

(l) Proposed regulations for VOC Concentrations Limits for Certain Products;

(m) Proposed notice requiring the preparation and implementation of pollution prevention plans in respect of specified substances on Schedule 1 of the Canadian Environmental Protection Act, 1999, related to the resin and synthetic rubber manufacturing sector;

(n) Proposed notice requiring the preparation and implementation of pollution prevention plans in respect of specified substances on Schedule 1 of the Canadian Environmental Protection Act, 1999, implicated in the polyurethane and other foam sector (except polystyrene);

(o) Notice with Respect to Certain Hydrochlorofluorocarbons;

(p) Notice with Respect to Certain Substances on the Domestic Substances List (DSL); and

(q) Environmental Code of Practice for the Reduction of Solvent Emissions from Dry Cleaning Facilities. PN 1053.

C. United States of America

8. Limit values for controlling emissions of VOCs from sources subject to National Volatile Organic Compound Emission Standards for Consumer and Commercial Products are specified in the following documents:

- (a) Automobile refinish coatings — 40 C.F.R. Part 59, Subpart B;
- (b) Consumer products — 40 C.F.R. Part 59, Subpart C;
- (c) Architectural coatings — 40 C.F.R. Part 59, Subpart D; and
- (d) Aerosol coatings — 40 C.F.R. Part 59, Subpart E.

Article 2 Relationship to the Gothenburg Protocol

No State or regional economic integration organization may deposit an instrument of acceptance of this Amendment unless it has previously, or simultaneously, deposited an instrument of ratification, acceptance, approval or accession to the Gothenburg Protocol.

Article 3 Entry into force

In accordance with article 13, paragraph 3, of the Gothenburg Protocol, this Amendment shall enter into force on the ninetieth day after the date on which two thirds of the Parties to the Gothenburg Protocol have deposited with the Depository their instruments of acceptance thereof.
