

## **OPTIONS FOR REVISING THE PROTOCOL ON PERSISTENT ORGANIC POLLUTANTS**

**Outcomes of the discussions by the Working Group on Strategies and Review,  
at its forty-fifth session (31 August – 4 September 2009)**

### Introductory note by the secretariat

1. The present informal document reflects the outcomes of the discussions held by the Working Group on Strategies and Review at its forty-fifth session (31 August – 4 September 2009) on options for revising the Protocol on Persistent Organic Pollutants (POPs) and its annexes I to VI and VIII as well as the proposals to turn chapters III to V of annex V into a guidance document and to delete annex VII. The options had been initially scrutinized by the ad hoc group of legal experts in parallel to and following the session. Proposed new text (to the Protocol currently in force) is indicated in bold.
2. At the twenty-seventh session of the Executive Body, in December 2009, the Parties to the Protocol will be invited to consider an official document containing draft decisions by the Parties to the Protocol (document ECE/EB.AIR/2009/9) with a view to adoption of the amendments set out therein. This document placing the amendments in context of the text of the Protocol has been prepared for the convenience of the Parties in consultation with the ad hoc group of legal experts following legal scrutiny of the proposed amendments by the Working Group as well as of any necessary consequential amendments to the Protocol or to its annexes.
3. In addition to the draft decisions for amending the Protocol on POPs, the Parties to the Protocol at the Executive Body session will be invited to consider a further decision adopting a draft guidance document (document ECE/EB.AIR/2009/14), consisting of chapters III to V of the current annex V to the Protocol on POPs.

## I. OPTIONS FOR REVISING ANNEX I ON SUBSTANCES SCHEDULED FOR ELIMINATION

Unless otherwise specified in the present Protocol, this annex shall not apply to the substances listed below when they occur: (i) as contaminants in products; or (ii) in articles manufactured or in use by the implementation date; or (iii) as site-limited chemical intermediates in the manufacture of one or more different substances and are thus chemically transformed. Unless otherwise specified, each obligation below is effective upon the date of entry into force of the Protocol.

Substance	Implementation requirements	
	Elimination of	Conditions
Aldrin CAS: 309-00-2	Production	None
	Use	None
Chlordane CAS: 57-74-9	Production	None
	Use	None
Chlordecone CAS: 143-50-0	Production	None
	Use	None
DDT CAS: 50-29-3	Production	<p><del>None</del> <u>Delete:</u></p> <p><u>1. Elimination production within one year of consensus by the Parties that suitable alternatives to DDT are available for public health protection from diseases such as malaria and encephalitis.</u></p> <p><u>2. With a view to eliminating the production of DDT at the earliest opportunity, the Parties shall, no later than one year after the data of entry into force of the present Protocol and periodically thereafter as necessary, and in consultation with the World Health Organization, the Food and Agriculture Organization of the United Nations and the United Nations Environment Programme, review the availability and feasibility of alternatives and, as appropriate, promote the commercialization of safer and economically viable alternatives to DDT.</u></p>
	Use	None, <del>except as identified in annex II.</del>
Dieldrin CAS: 60-51-1	Production	None
	Use	None
Endrin CAS: 72-20-8	Production	None
	Use	None
Heptachlor	Production	None

Substance	Implementation requirements	
	Elimination of	Conditions
CAS: 76-44-8	Use	None, <del>except for use by certified personnel for the control of fire ants in closed industrial electrical junction boxes. Such use shall be re-evaluated under this Protocol no later than two years after the date of entry into force.</del>
Hexabromobiphenyl CAS: 36355-01-8	Production	None
	Use	None
Hexachlorobenzene CAS: 118-74-1	Production	None, <del>except for production for a limited purpose as specified in a statement deposited by a country with an economy in transition upon signature or accession.</del>
	Use	None, <del>except for production for a limited purpose as specified in a statement deposited by a country with an economy in transition upon signature or accession.</del>
Hexachlorobutadiene CAS: 87-68-3	Production	None
	Use	None
Hexachlorocyclohexane (HCH) CAS: 608-73-1	Production	None
	Use	None, except for lindane (CAS: 58-89-9) used as topical insecticide for public health purposes. Such uses shall be re-evaluated under this Protocol in 2012 or one year after the amendment enters into force, whichever is later
Hexabromodiphenyl ether* and heptabromodiphenyl ether*	Production	None
	Use	<ol style="list-style-type: none"> <li>1. A Party may allow recycling of articles that contain or may contain any of these substances, and the use and final disposal of articles manufactured from recycled materials that contain or may contain any of these substances, provided that the recycling and final disposal is carried out in an environmentally sound manner and does not lead to recovery of any of these substances for the purpose of their reuse;</li> <li>2. Commencing 2013 and every four years subsequently until the above condition is removed or otherwise expires, the Executive Body shall evaluate the progress that Parties have made towards achieving their ultimate objective of elimination of these substances contained in articles and review the continued need for the condition, which shall in any case expire at the latest in 2030.</li> </ol>

Substance	Implementation requirements	
	Elimination of	Conditions
<p><b>*“Hexabromodiphenyl ether and heptabromodiphenyl ether” mean 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153, CAS No: 68631-49-2), 2,2',4,4',5,6'-hexabromodiphenyl ether (BDE-154, CAS No: 207122-15-4), 2,2',3,3',4,5',6 heptabromodiphenyl ether (BDE-175, CAS No: 446255-22-7), 2,2',3,4,4',5',6-heptabromodiphenyl ether (BDE-183, CAS No: 207122-16-5) and other hexa- and heptabromodiphenyl ethers present in commercial octabromodiphenyl ether</b></p>		
Tetrabromodiphenyl ether* and pentabromodiphenyl ether*	Production	None
	Use	<ol style="list-style-type: none"> <li>1. A Party may allow recycling of articles that contain or may contain any of these substances, and the use and final disposal of articles manufactured from recycled materials that contain or may contain any of these substances, provided that the recycling and final disposal is carried out in an environmentally sound manner and does not lead to recovery of any of these substances for the purpose of their reuse;</li> <li>2. Commencing 2013 and every four years subsequently until the above condition is removed or otherwise expires, the Executive Body shall evaluate the progress that Parties have made towards achieving their ultimate objective of elimination of these substances contained in articles and review the continued need for the condition, which shall in any case expire at the latest in 2030.</li> </ol>
Mirex CAS: 2385-85-5	Production	None
	Use	None
Pentachlorobenzene CAS : 608-93-5	Production	None
	Use	None
<p><b>*/ “Tetrabromodiphenyl ether and pentabromodiphenyl ether” means 2,2',4,4'-tetrabromodiphenyl ether (BDE-47, CAS No: 40088-47-9) and 2,2',4,4',5-pentabromodiphenyl ether (BDE-99, CAS No: 32534-81-9) and other tetra- and pentabromodiphenyl ethers present in commercial pentabromodiphenyl ether.</b></p>		
Perfluorooctane sulfonate (PFOS)*	Production	None, except for production for the uses (a)-(c) below, and (a)-(e) in Annex II
	Use	<p>None, except for the following uses and uses (a)-(e) in Annex II:</p> <ol style="list-style-type: none"> <li>(a) Chromium electroplating, chromium anodizing and reverse etching until 2014;</li> <li>(b) Electroless nickel-polytetrafluoroethylene plating until 2014;</li> <li>(c) Etching of plastic substrates prior to their</li> </ol>

Substance	Implementation requirements	
	Elimination of	Conditions
		<p>metalization until 2014</p> <p>(d) Firefighting foams, but only if they have been manufactured or were in use by <i>(insert date of adoption of amendment)</i></p> <p>With respect to firefighting foams:</p> <p>(i) Parties should endeavor to eliminate by 2014 firefighting foams containing PFOS that were manufactured or in use by <i>(insert date of adoption of amendment)</i> and shall report on their progress to the Executive Body in 2014</p> <p>(ii) Based on the reports of the Parties and paragraph (i), the Executive Body shall in 2015 assess whether the use of firefighting foams containing PFOS that were manufactured or in use by <i>(insert date of adoption of amendment)</i> should be subject to additional restrictions.</p>

\*/ Perfluorooctane sulfonate (PFOS) means substances defined by the molecular formula C<sub>8</sub>F<sub>17</sub>SO<sub>2</sub>X, where X=OH, metal salt, halide, amide or other derivatives including polymers.

Polychlorinated biphenyls (PCB) <sup>a/</sup>	Production	None, <u>except for countries with economies in transition which shall eliminate production as soon as possible and no later than 31 December 2005 and which state in a declaration to be deposited together with their instrument of ratification, acceptance, approval or accession, their intention to do so.</u>
	Use	<p><u>None. Concerning PCBs in use by the implementation date, Parties shall:</u></p> <p>1. <u>make determined efforts</u> designed to lead to:</p> <p>(a) <u>the elimination of the use of identifiable PCBs in equipment (i.e. transformers, capacitors or other receptacles containing residual liquid stocks) containing PCBs in volumes greater than 5 dm<sup>3</sup> and having a concentration of 0.05% PCBs or greater, as soon as possible but no later than 3 December 2010, or 31 December 2015 for countries with economies in transition;</u></p> <p>(b) <u>the destruction or decontamination in an environmentally sound manner of:</u></p> <ul style="list-style-type: none"> <li>- <u>all liquid PCBs referred to in subparagraph (a) and other liquid PBCs containing more than 0.005% PCBs not in equipment, as soon as possible but no later than 31 December 2015, or 31 December 2020 for countries with economies in transition;</u></li> <li>- <u>all liquid PCBs referred to in paragraph 2.(a) no</u></li> </ul>

- later than 31 December 2029;
- (c) the decontamination or disposal of equipment referred in subparagraphs 1.(a) and 2.(a) in an environmentally sound manner;
2. **endeavour to:**
- (a) identify and remove from use equipment (e.g. transformers, capacitors or other receptacles containing liquid stocks) containing more than 0.005% PCBs and volumes greater than 0.05 dm<sup>3</sup>, as soon as possible but no later than 31 December 2025;
- (b) identify other articles containing more than 0.005% PCBs (e.g. cable sheaths, cured caulk and painted objects) and manage them in accordance with paragraph 3 of Article 3;
3. **ensure that** the equipment described in subparagraphs 1.(a) and 2.(a) is not exported or imported other than for the purpose of environmentally sound waste management;
4. **promote** the following to reduce exposures and risk to control the use of PCBs:
- (a) use PCBs only in intact and non-leaking equipment and only in areas where the risk from environmental release can be minimized and quickly remedied;
- (b) not use PCBs in equipment in areas associated with the production or processing of food or feed;
- (c) when PCBs are used in populated areas, including schools and hospitals, take all reasonable measures to prevent electrical failures that could result in a fire, and regularly inspect equipment for leaks.

None, except as identified in annex II.

**Concerning PCBs in use by the implementation date, Parties shall:**

- 1. ensure that the equipment described in subparagraphs 3(a) and 4(a) is not exported or imported other than for the purpose of environmentally sound waste management;**
- 2. promote the following to reduce exposures and risk to control the use of PCBs:**
- (a) Use PCBs only in intact and non-leaking equipment and only in areas where the risk from environmental release can be minimized and quickly remedied;**
- (b) Not use PCBs in equipment in areas associated with the production or processing of food or feed;**

		<p><del>(c) when PCBs are used in populated areas, including schools and hospitals, take all reasonable measures to prevent electrical failures that could result in a fire, and regularly inspect equipment for leaks</del></p> <p><del>3. make determined efforts designed to lead to:</del></p> <p><del>(a) the elimination of the use of identifiable PCBs in equipment (i.e. transformers, capacitors or other receptacles containing residual liquid stocks) containing PCBs in volumes greater than 5 dm<sup>3</sup> and having a concentration of 0.05% PCBs or greater, as soon as possible but no later than 3 December 2010, or 31 December 2015 for countries with economies in transition;</del></p> <p><del>(b) the destruction or decontamination in an environmentally sound manner of:</del></p> <p><del>–all liquid PCBs referred to in subparagraph (a) and liquid PCBs containing more than 0.005% PCBs not in equipment, as soon as possible but no later than 31 December 2015, or 31 December 2020 for countries with economies in transition;</del></p> <p><del>–all liquid PCBs referred to in paragraph 4(a) no later than 31 December 2029;</del></p> <p><del>(c) the decontamination or disposal of equipment referred in paragraphs 3(a) and 4(a) in an environmentally sound manner.</del></p> <p><del>4. endeavour to:</del></p> <p><del>(a) identify and remove from use equipment (e.g. transformers, capacitors or other receptacles containing liquid stocks) containing more than 0.005% PCBs and volumes greater than 0.05 dm<sup>3</sup>, as soon as possible but no later than 31 December 2025;</del></p> <p><del>(b) identify other articles containing more than 0.005% PCBs (e.g. cable sheaths, cured caulk and painted objects) and manage them in accordance with paragraph 3 of Article 3</del></p>
Polychlorinated naphthalenes (PCN)	Production	None
	Use	None
Short-chain chlorinated paraffins	Production	None, except for production for the uses specified in Annex II
	Use	None, except for the uses specified in Annex II
Toxaphene CAS: 8001-35-2	Production	None
	Use	None

a/ "Polychlorinated biphenyls" means aromatic compounds formed in such a manner that the hydrogen atoms on the biphenyl molecule (two benzene rings bonded together by a single carbon-carbon bond) may be replaced up to 10 chlorine atoms.

## II. OPTIONS FOR REVISING ANNEX II ON SUBSTANCES SCHEDULED FOR RESTRICTIONS ON USE

Unless otherwise specified in the present Protocol, this annex shall not apply to the substances listed below when they occur: (i) as contaminants in products; or (ii) in articles manufactured or in use by the implementation date; or (iii) as site-limited chemical intermediates in the manufacture of one or more different substances and are thus chemically transformed. Unless otherwise specified, each obligation below is effective upon the date of entry into force of the Protocol.

Substance	Implementation requirements	
	Restricted to uses	Conditions
<del>DDT CAS: 50-29-3</del>	<del>1. For public health protection from diseases such as malaria and encephalitis.  2. As a chemical intermediate to produce Dicofof.</del>	<del>1. Use allowed only as a component of an integrated pest management strategy and only to the extent necessary and only until one year after the date of the elimination of production in accordance with annex I. 2. Such use shall be reassessed no later than two years after the date of entry into force of the present Protocol</del>
<del>[HCH CAS: 608-73-1 —deleted]</del>	<del>[Technical HCH (i.e. HCH mixed isomers) is restricted to use as an intermediate in chemical manufacturing. —deleted]</del>	
	<del>[Products in which at least 99% of the HCH isomer is in the gamma form (i.e. lindane, CAS: 58-89-9) are restricted to the following uses: 1. Seed treatment. 2. Soil applications directly followed by incorporation into the topsoil surface layer 3. Professional remedial and industrial treatment of lumber, timber and logs 4. Public health and veterinary topical insecticide. 5. Non-aerial application to tree seedlings, small-scale lawn use,</del>	<del>[All restricted uses of lindane shall be reassessed under the Protocol no later than two years after the date of entry into force —deleted]</del>

Substance	Implementation requirements	
	Restricted to uses	Conditions
	<del>and indoor and outdoor use for nursery stock and ornamentals. 6. Indoor industrial and residential applications—<u>deleted</u></del>	
Perfluorooctane sulfonate (PFOS)*	<p>(a) Photo-resist or anti-reflective coatings for photolithography processes;</p> <p>(b) Photographic coatings applied to films, papers or printing plates;</p> <p>(c) Mist suppressants for non-decorative hard chromium (VI) plating and wetting agents for use in controlled electroplating systems;</p> <p>(d) Hydraulic fluids for aviation;</p> <p>(e) Certain medical devices (such as ethylene tetrafluoroethylene copolymer (ETFE) layers and radio-opaque ETFE production, in vitro diagnostic medical devices, and CCD colour filters).</p>	<p>Parties should take action to eliminate these uses once suitable alternatives are available.</p> <p>No later than 2015 and every four years thereafter, each Party that uses these substances shall report on progress made to eliminate them and submit information on such progress to the Executive Body. Based on these reports, these restricted uses shall be reassessed.</p>
Short-chain chlorinated paraffins	<p>(a) Fire retardants in rubber used in conveyor belts in the mining industry;</p> <p>(b) Fire retardants in dam sealants</p>	<p>Parties should take action to eliminate these uses once suitable alternatives are available.</p> <p>No later than 2015 and every four years thereafter, each Party that uses these substances shall report on progress made to eliminate them and submit information on such progress to the Executive Body. Based on these reports, these restricted uses shall be reassessed.</p>
<del>PCB<sup>a/</sup></del>	<del>PCB in use as of the date of entry into force or produced up to 31 December 2005 in accordance with the provisions of annex I.</del>	<del>Parties shall make determined efforts designed to lead to: (a) The elimination of the use of identifiable PCBs in equipment (i.e. transformers, capacitors or other receptacles containing PCBs in volumes greater than 5 dm<sup>3</sup> and having a concentration of 0.05% PCBs or greater, as soon as possible, but no later than 31</del>

Substance	Implementation requirements	
	Restricted to uses	Conditions
		<p><del>December 2010, or 31 December 2015 for countries with economies in transition;</del></p> <p><del>(b) The destruction or decontamination in an environmentally sound manner of all liquid PCBs referred to in subparagraph (a) and other liquid PCBs containing more than 0.005% PCBs not in equipment, as soon as possible, but no later than 31 December 2015, or 31 December 2020 for countries with economies in transition; and</del></p> <p><del>(c) The decontamination or disposal of equipment referred in subparagraph (a) in an environmentally sound manner.</del></p>

\*/ Perfluorooctane sulfonate (PFOS) means substances defined by the molecular formula C<sub>8</sub>F<sub>17</sub>SO<sub>2</sub>X, where X=OH, metal salt, halide, amide or other derivatives including polymers.

### III. OPTIONS FOR REVISING ANNEX III ON SUBSTANCES REFERRED TO IN ARTICLE 3, PARAGRAPH 5 (a), AND THE REFERENCE YEAR FOR THE OBLIGATION

Substance	Reference year
PAHs <sup>a/</sup>	1990; or an alternative year from 1985 to 1995 inclusive, <b>or for countries with economies in transition, an alternative year from 1985 to the year of the entry into force of the Protocol for a Party, and as specified by <del>a</del> that Party upon ratification, acceptance, approval or accession</b>
Dioxins/furans <sup>b/</sup>	1990; or an alternative year from 1985 to 1995 inclusive, <b>or for countries with economies in transition, an alternative year from 1985 to the year of the entry into force of the Protocol for a Party, and as specified by that Party upon ratification, acceptance, approval or accession.</b>
Hexachlorobenzene CAS: 118-74-1	1990; or an alternative year from 1985 to 1995 inclusive, <b>or for countries with economies in transition, an alternative year from 1985 to the year of the entry into force of the Protocol for a Party, and as specified by that Party upon ratification, acceptance, approval or accession.</b>
PCBs <sup>c/</sup>	<b>2005; or an alternative year from 1995 to 2010 inclusive, or for countries with economies in transition, an alternative year from 1995 to the year of the entry into force of the Protocol for a Party, and as specified by a that Party upon ratification, acceptance, approval or accession.</b>

<sup>a/</sup> Polycyclic aromatic hydrocarbons (PAHs): For the purposes of emission inventories, the following four indicator compounds shall be used: benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene.

b/ Dioxins and furans (PCDD/F): Polychlorinated dibenzo-*p*-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) are tricyclic, aromatic compounds formed by two benzene rings which are connected by two oxygen atoms in PCDD and by one oxygen atom in PCDF and the hydrogen atoms of which may be replaced by up to eight chlorine atoms.

c/ **Polychlorinated biphenyls, as defined in Annex I, when emitted as an unintentional by-product.**

#### IV. OPTIONS FOR REVISING ANNEX IV ON LIMIT VALUES FOR PCDD/F FROM MAJOR STATIONARY SOURCES

##### I. INTRODUCTION

1. A definition of dioxins and furans (PCDD/F) is provided in annex III to the present Protocol.
2. Limit values are expressed as ng/m<sup>3</sup> or mg/m<sup>3</sup> under standard conditions (273.15 K, 101.3 kPa, ~~and~~ dry gas, **and for a given oxygen content**).
3. Limit values relate to the normal operating situation, ~~including start-up and shutdown procedures, unless specific limit values have been defined for those situations.~~ **For batch operations, limit values relate to average levels as recorded during the whole batch process – including for example pre-heating, heating and cooling.**
4. Sampling and analysis of all pollutants shall be carried out according to the **applicable** standards laid down by **for example** the Comité européen de normalisation (CEN), the International Organization for Standardization (ISO), or the corresponding United States or Canadian reference methods.
5. For verification purposes, the interpretation of measurement results in relation to the limit value must also take into account the inaccuracy of the measurement method. A limit value is considered to be met if the result of the measurement, from which the inaccuracy of the measurement method is subtracted, does not exceed it.
6. ~~Emissions of different congeners of PCDD/F are given in toxicity equivalents (TE) in comparison to 2,3,7,8-TCDD using the system proposed by the NATO Committee on the Challenges of Modern Society (NATO-CCMS) in 1988.~~ **Emissions of PCDD/F are given in total toxic equivalents (TEQ)<sup>1</sup>. The toxic equivalence factor values to be used for the purposes of this Protocol shall be consistent with applicable international standards, including the World Health Organisation 2005 mammalian toxic equivalence factor values for PCDD/F.**

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<sup>1</sup> The total toxic equivalent (TEQ) is operationally defined by the sum of the products of the concentration of each compound multiplied by its toxic equivalency factor (TEF) value and is an estimate of the total 2,3,7,8-TCDD-like activity of the mixture. Total toxic equivalent was previously abbreviated as TE.

## II. LIMIT VALUES FOR MAJOR STATIONARY SOURCES

7. The following limit values, which refer to 11% O<sub>2</sub> concentration in flue gas, apply to the following incinerator types:

Municipal solid waste (~~burning more than 3 tonnes per hour~~) (existing stationary source burning more than 3 tonnes per hour and every new stationary source)

0.1 ng TEQ/m<sup>3</sup>

Medical solid waste (~~burning more than 1 tonne per hour~~) (existing stationary source burning more than 1 tonne per hour and every new stationary source)

New stationary source: 0.1 ng TEQ/m<sup>3</sup>  
Existing stationary source: 0.5 ng TEQ/m<sup>3</sup> <sup>a/</sup>

Hazardous waste (~~burning more than 1 tonne per hour~~) (existing stationary source burning more than 1 tonne per hour and every new stationary source)

New stationary source: 0.1 ng TEQ/m<sup>3</sup>  
Existing stationary source: 0.2 ng TEQ/m<sup>3</sup> <sup>a/</sup>

[Non hazardous industrial waste<sup>2</sup> <sup>b/</sup>

New stationary source: 0.1 ng TEQ/m<sup>3</sup>  
Existing stationary source: 0.5 ng TEQ/m<sup>3</sup> <sup>a/</sup>

[8. The following limit value[s], which refer to 16% O<sub>2</sub> concentration in flue gas, apply to sinter-plants:

[New stationary source: [0.1<sup>a/</sup>] ng TEQ/m<sup>3</sup>  
Existing stationary source: [0.5] ng TEQ/m<sup>3</sup> – option-1]<sup>c/</sup>

[New stationary source: [0.5] ng TEQ/m<sup>3</sup>  
Existing stationary source: [0.5 - 1.0 – one value in this range] ng TEQ/m<sup>3</sup>  
(with the purpose to achieve an average emission of 0.5 TEQ/m<sup>3</sup>) – option-2, taking into account an additional margin between ELV and BAT-AEL, if found necessary]].

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a/ EECCA countries preferred these limit values.

b/ EECCA countries did not see the rationale in establishing a limit for non-hazardous industrial waste

c/ The drafting group considered this value might not be possible and suggested Parties to revisit this limit value

[<sup>2</sup> Including incinerators treating biomass waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood-preservatives or coating, and which includes in particular biomass waste originating from construction and demolition waste, but excluding incinerators only treating other biomass waste.]

[9. The following limit value[s], which refer to the actual O<sub>2</sub> concentration in flue gas, apply to the following sources:

[Secondary steel production – Electric arc furnaces<sup>a/</sup>:

[New stationary source: [0.1] ng TEQ/m<sup>3</sup>

Existing stationary source: [0.5] ng TEQ/m<sup>3</sup> – option-1]<sup>b/</sup>

[New stationary source: [0.5] ng TEQ/m<sup>3</sup>

Existing stationary source: [0.5 - 1.0 – one value in this range] ng TEQ/m<sup>3</sup>  
(with the purpose to achieve an average emission of 0.5 TEQ/m<sup>3</sup>) – option-2,  
taking into account an additional margin between ELV and BAT-AEL, if found necessary]]

[Secondary production of aluminum<sup>c/</sup>:

[New stationary source: [0.1] ng TEQ/m<sup>3</sup>

Existing stationary source: [0.5] ng TEQ/m<sup>3</sup> – option-1]<sup>b/</sup>

[New stationary source: 0.5 ng TEQ/m<sup>3</sup>

Existing stationary source: [0.5 - 1.0 – one value in this range] ng TEQ/m<sup>3</sup>  
(with the purpose to achieve an average emission of 0.5 TEQ/m<sup>3</sup>) – option-2,  
taking into account an additional margin between ELV and BAT-AEL, if found necessary]]

[Secondary production of copper<sup>a/</sup>:

[New stationary source: [0.1] ng TEQ/m<sup>3</sup>

Existing stationary source: [0.5] ng TEQ/m<sup>3</sup> – option-1]<sup>b/</sup>

[New stationary source: 0.5 ng TEQ/m<sup>3</sup>

Existing stationary source: [0.5 - 1.0 – one value in this range] ng TEQ/m<sup>3</sup>  
(with the purpose to achieve an average emission of 0.5 TEQ/m<sup>3</sup>) – option-2,  
taking into account an additional margin between ELV and BAT-AEL, if found necessary]]

a/ Capacity thresholds were requested by EECCA. These should be established between WGSR and EB.

b/ EECCA preferred this option and the drafting group was supportive for that preference

## V. OPTIONS FOR REVISING ANNEX V ON BEST AVAILABLE TECHNIQUES TO CONTROL EMISSIONS OF PERSISTENT ORGANIC POLLUTANTS FROM MAJOR STATIONARY SOURCES

### I. INTRODUCTION

1. The purpose of this annex is to provide the Parties to the Convention with guidance in identifying best available techniques to allow them to meet the obligations in article 3, paragraph 5, of the Protocol. Further description of, and guidance regarding, such best available techniques is provided in a guidance document adopted by the Parties at a session of the Executive Body

and may be updated as necessary by a consensus of the Parties meeting within the Executive Body.

2. "Best available techniques" (BAT) means the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and their impact on the environment as a whole:

- 'Techniques' includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;
- 'Available' techniques means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the territory of the Party in question, as long as they are reasonably accessible to the operator;
- 'Best' means most effective in achieving a high general level of protection of the environment as a whole.

In determining the best available techniques, special consideration should be given, generally or in specific cases, to the factors below, bearing in mind the likely costs and benefits of a measure and the principles of precaution and prevention:

- The use of low-waste technology;
- The use of less hazardous substances;
- The furthering of recovery and recycling of substances generated and used in the process and of waste;
- Comparable processes, facilities or methods of operation which have been tried with success on an industrial scale;
- Technological advances and changes in scientific knowledge and understanding;

- The nature, effects and volume of the emissions concerned;
- The commissioning dates for new or existing installations;
- The time needed to introduce the best available technique;
- The consumption and nature of raw materials (including water) used in the process and its energy efficiency;
- The need to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it;
- The need to prevent accidents and to minimize their consequences for the environment.

The concept of best available techniques is not aimed at the prescription of any specific technique or technology, but at taking into account the technical characteristics of the installation concerned, its geographical location and the local environmental conditions.

3. Information regarding the effectiveness and costs of control measures is based on documents received and reviewed by the Task Force and the Preparatory Working Group on POPs. Unless otherwise indicated, the techniques listed are considered to be well established on the basis of operational experience.

4. Experience with new plants incorporating low-emission techniques, as well as with retrofitting of existing plants, is continuously growing. The regular elaboration and amendment of [the annex-the guidance document referred to in paragraph 1 above](#) will therefore be necessary. Best available techniques (BAT) identified for new plants can usually be applied to existing plants provided there is an adequate transition period and they are adapted.

5. [The guidance document referred to in paragraph 1 above](#) ~~The annex~~ lists a number of control measures which span a range of costs and efficiencies. The choice of measures for any particular case will depend on a number of factors, including economic circumstances, technological infrastructure and capacity, and any existing air pollution control measures.

6. The most important POPs emitted from stationary sources are:

- (a) Polychlorinated dibenzo-p-dioxins/furans (PCDD/F);
- (b) Hexachlorobenzene (HCB);
- (c) Polycyclic aromatic hydrocarbons (PAHs).

Relevant definitions are provided in annex III to the present Protocol.

## II. MAJOR STATIONARY SOURCES OF POP EMISSIONS

7. PCDD/F are emitted from thermal processes involving organic matter and chlorine as a result of incomplete combustion or chemical reactions. Major stationary sources of PCDD/F may be as follows:

- (a) Waste incineration, including co-incineration;
- (b) Thermal metallurgical processes, e.g. production of aluminium and other non-ferrous metals, iron and steel;
- (c) Combustion plants providing energy;
- (d) Residential combustion; and
- (e) Specific chemical production processes releasing intermediates and by-products.

8. Major stationary sources of PAH emissions may be as follows:
- (a) Domestic wood and coal heating;
  - (b) Open fires such as refuse burning, forest fires and after-crop burning;
  - (c) Coke and anode production;
  - (d) Aluminium production (via Soederberg process); and
  - (e) Wood preservation installations, except for a Party for which this category does not make a significant contribution to its total emissions of PAH (as defined in annex III).
9. Emissions of HCB result from the same type of thermal and chemical processes as those emitting PCDD/F, and HCB is formed by a similar mechanism. Major sources of HCB emissions may be as follows:
- (a) Waste incineration plants, including co-incineration;
  - (b) Thermal sources of metallurgical industries; and
  - (c) Use of chlorinated fuels in furnace installations.
- [(d) Residential combustion sources]**

**Parts III, IV, and V of annex V have been deleted**

**(Ad hoc group of legal experts: Please add a para explaining that the BAT descriptions of measures to restrict POP emissions formerly contained in parts III, IV and V of annex V to the Protocol are provided in a Guidance document)**

## **VI. OPTIONS FOR REVISING ANNEX VI ON TIMESCALES FOR THE APPLICATION OF LIMIT VALUES AND BEST AVAILABLE TECHNIQUES TO NEW AND EXISTING STATIONARY SOURCES**

1. The timescales for the application of limit values and best available techniques are:
- (a) For new stationary sources: two years after the date of entry into force of the present Protocol;
  - (b) For existing stationary sources:
    - (i) eight years after the date of entry into force of the present Protocol. If necessary, this period may be extended for specific existing stationary sources in accordance with the amortization period provided for by national legislation; **or**
    - (ii) **for a Party that is a country with an economy in transition, up to fifteen years after the date of entry into force of the present protocol for a Party.**
2. **The timescales for the application of limit values and best available techniques that have been updated or introduced as a result of amendment of this Protocol shall be:**

- (a) for new stationary sources, two years after the date of entry into force of the relevant amendment for a Party; and<sup>3</sup>
- (b) for existing stationary sources:
  - (ii) eight years after the date of entry into force of the relevant amendment for a Party; or
  - (ii) for a Party that is a country with an economy in transition, up to fifteen years after the date of entry into force of the relevant amendment for a Party.

## VII. OPTIONS FOR REVISING ANNEX VII ON RECOMMENDED CONTROL MEASURES FOR REDUCING EMISSIONS OF PERSISTENT ORGANIC POLLUTANTS FROM MOBILE SOURCES

~~1. Relevant definitions are provided in annex III to the present Protocol. [Annex VII is deleted] (to be revised by legal experts)~~

~~The reasons for deleting annex VII: As a result of the phase-out of leaded petrol in most parts of the UNECE region, petrol fuelled vehicles are no longer a relevant source of PCDD/PCDF. Furthermore, diesel powered engines, which are formally a main source of fine particulates, with PAHs as a major component, are subject to stricter controls for particulate matter (PM) under regulations outside of the Protocol (see EB.AIR/WG.5/2005/1, paras. 33–37).~~

~~[Deleted]~~

## VIII. OPTIONS FOR REVISING ANNEX VIII ON MAJOR STATIONARY SOURCE CATEGORIES

### I. INTRODUCTION

Installations or parts of installations for research, development and the testing of new products are not covered by this list. A more complete description of the categories may be found in ~~the guidance document referred to in paragraph 1 of annex V.~~

### II. LIST OF CATEGORIES

Category	Description of the category
1	<del>Incineration, including co-incineration, of municipal, hazardous or medical waste, or of sewage sludge</del> Waste incineration, including co-incineration, of municipal, hazardous, non-hazardous and medical wastes and sewage sludge

<sup>3</sup> Given the definition of new stationary sources as been built after 2006, we need to give consideration to Para 2 a at the EB

2	Sinter plants.
3	Primary and secondary production of copper.
4	Production of steel.
5	Smelting plants in the secondary aluminium industry.
6	Combustion of fossil fuels in utility and industrial boilers with a thermal capacity above 50 MW <sub>th</sub> .
7	Residential combustion.
8	Firing installations for wood with a thermal capacity below 50 MW <sub>th</sub> .
9	Coke production.
10	Anode production.
11	Aluminium production using the Soederberg process.
12	Wood preservation installations, except for a Party for which this category does not make a significant contribution to its total emissions of PAH (as defined in <a href="#">annex III</a> )
13	<b>Specific chemical production processes releasing [unintentionally formed] persistent organic pollutants, especially production of chlorophenols and chloranil.</b>
14	<b>Thermal processes in the metallurgical industry, chlorine based methods.</b>
[15]	<b>[Installations for recycling or shredding of municipal and industrial waste.]</b>