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The Vienna Convention for the Protection of the Ozone Layer

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UNEP

**Ozone Secretariat
United Nations Environment Programme**

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by

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The Vienna Convention for the Protection of the Ozone Layer

Preamble

The Parties to this Convention,

Aware of the potentially harmful impact on human health and the environment through modification of the ozone layer,

Recalling the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, and in particular principle 21, which provides that “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”,

Taking into account the circumstances and particular requirements of developing countries,

Mindful of the work and studies proceeding within both international and national organizations and, in particular, of the World Plan of Action on the Ozone Layer of the United Nations Environment Programme,

Mindful also of the precautionary measures for the protection of the ozone layer which have already been taken at the national and international levels,

Aware that measures to protect the ozone layer from modifications due to human activities require international co-operation and action, and should be based on relevant scientific and technical considerations,

Aware also of the need for further research and systematic observations to further develop scientific knowledge of the ozone layer and possible adverse effects resulting from its modification,

Determined to protect human health and the environment against adverse effects resulting from modifications of the ozone layer,

HAVE AGREED AS FOLLOWS:

Article 1: Definitions

For the purposes of this Convention:

1. “The ozone layer” means the layer of atmospheric ozone above the planetary boundary layer.
2. “Adverse effects” means changes in the physical environment or biota, including changes in climate, which have significant deleterious effects on human health or on the composition, resilience and productivity of natural and managed ecosystems, or on materials useful to mankind.
3. “Alternative technologies or equipment” means technologies or equipment the use of which makes it possible to reduce or effectively eliminate emissions of substances which have or are likely to have adverse effects on the ozone layer.
4. “Alternative substances” means substances which reduce, eliminate or avoid adverse effects on the ozone layer.
5. “Parties” means, unless the text otherwise indicates, Parties to this Convention.
6. “Regional economic integration organization” means an organization constituted by sovereign States of a given region which has competence in respect of matters governed by this Convention or its protocols and has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to the instruments concerned.
7. “Protocols” means protocols to this Convention.

Article 2: General obligations

1. The Parties shall take appropriate measures in accordance with the provisions of this Convention and of those protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer.

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2. To this end the Parties shall, in accordance with the means at their disposal and their capabilities:
 - (a) Co-operate by means of systematic observations, research and information exchange in order to better understand and assess the effects of human activities on the ozone layer and the effects on human health and the environment from modification of the ozone layer;
 - (b) Adopt appropriate legislative or administrative measures and co-operate in harmonizing appropriate policies to control, limit, reduce or prevent human activities under their jurisdiction or control should it be found that these activities have or are likely to have adverse effects resulting from modification or likely modification of the ozone layer;
 - (c) Co-operate in the formulation of agreed measures, procedures and standards for the implementation of this Convention, with a view to the adoption of protocols and annexes;
 - (d) Co-operate with competent international bodies to implement effectively this Convention and protocols to which they are party.
3. The provisions of this Convention shall in no way affect the right of Parties to adopt, in accordance with international law, domestic measures additional to those referred to in paragraphs 1 and 2 above, nor shall they affect additional domestic measures already taken by a Party, provided that these measures are not incompatible with their obligations under this Convention.
4. The application of this article shall be based on relevant scientific and technical considerations.

Article 3: Research and systematic observations

1. The Parties undertake, as appropriate, to initiate and co-operate in, directly or through competent international bodies, the conduct of research and scientific assessments on:
 - (a) The physical and chemical processes that may affect the ozone layer;

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- (b) The human health and other biological effects deriving from any modifications of the ozone layer, particularly those resulting from changes in ultra-violet solar radiation having biological effects (UV-B);
 - (c) Climatic effects deriving from any modifications of the ozone layer;
 - (d) Effects deriving from any modifications of the ozone layer and any consequent change in UV-B radiation on natural and synthetic materials useful to mankind;
 - (e) Substances, practices, processes and activities that may affect the ozone layer, and their cumulative effects;
 - (f) Alternative substances and technologies;
 - (g) Related socio-economic matters;
- and as further elaborated in annexes I and II.
2. The Parties undertake to promote or establish, as appropriate, directly or through competent international bodies and taking fully into account national legislation and relevant ongoing activities at both the national and international levels, joint or complementary programmes for systematic observation of the state of the ozone layer and other relevant parameters, as elaborated in annex I.
 3. The Parties undertake to co-operate, directly or through competent international bodies, in ensuring the collection, validation and transmission of research and observational data through appropriate world data centres in a regular and timely fashion.

Article 4: Co-operation in the legal, scientific and technical fields

1. The Parties shall facilitate and encourage the exchange of scientific, technical, socio-economic, commercial and legal information relevant to this Convention as further elaborated in annex II. Such information shall be supplied to bodies agreed upon by the Parties. Any such body receiving information regarded as confidential by the supplying Party shall ensure that such information is not disclosed

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and shall aggregate it to protect its confidentiality before it is made available to all Parties.

2. The Parties shall co-operate, consistent with their national laws, regulations and practices and taking into account in particular the needs of the developing countries, in promoting, directly or through competent international bodies, the development and transfer of technology and knowledge. Such co-operation shall be carried out particularly through:
 - (a) Facilitation of the acquisition of alternative technologies by other Parties;
 - (b) Provision of information on alternative technologies and equipment, and supply of special manuals or guides to them;
 - (c) The supply of necessary equipment and facilities for research and systematic observations;
 - (d) Appropriate training of scientific and technical personnel.

Article 5: Transmission of information

The Parties shall transmit, through the secretariat, to the Conference of the Parties established under article 6 information on the measures adopted by them in implementation of this Convention and of protocols to which they are party in such form and at such intervals as the meetings of the parties to the relevant instruments may determine.

Article 6: Conference of the Parties

1. A Conference of the Parties is hereby established. The first meeting of the Conference of the Parties shall be convened by the secretariat designated on an interim basis under article 7 not later than one year after entry into force of this Convention. Thereafter, ordinary meetings of the Conference of the Parties shall be held at regular intervals to be determined by the Conference at its first meeting.
2. Extraordinary meetings of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that,

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- within six months of the request being communicated to them by the secretariat, it is supported by at least one third of the Parties.
3. The Conference of the Parties shall by consensus agree upon and adopt rules of procedure and financial rules for itself and for any subsidiary bodies it may establish, as well as financial provisions governing the functioning of the secretariat.
 4. The Conference of the Parties shall keep under continuous review the implementation of this Convention, and, in addition, shall:
 - (a) Establish the form and the intervals for transmitting the information to be submitted in accordance with article 5 and consider such information as well as reports submitted by any subsidiary body;
 - (b) Review the scientific information on the ozone layer, on its possible modification and on possible effects of any such modification;
 - (c) Promote, in accordance with article 2, the harmonization of appropriate policies, strategies and measures for minimizing the release of substances causing or likely to cause modification of the ozone layer, and make recommendations on any other measures relating to this Convention;
 - (d) Adopt, in accordance with articles 3 and 4, programmes for research, systematic observations, scientific and technological co-operation, the exchange of information and the transfer of technology and knowledge;
 - (e) Consider and adopt, as required, in accordance with articles 9 and 10, amendments to this Convention and its annexes;
 - (f) Consider amendments to any protocol, as well as to any annexes thereto, and, if so decided, recommend their adoption to the parties to the protocol concerned;
 - (g) Consider and adopt, as required, in accordance with article 10, additional annexes to this Convention;
 - (h) Consider and adopt, as required, protocols in accordance with article 8;

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- (i) Establish such subsidiary bodies as are deemed necessary for the implementation of this Convention;
 - (j) Seek, where appropriate, the services of competent international bodies and scientific committees, in particular the World Meteorological Organization and the World Health Organization as well as the Co-ordinating Committee on the Ozone Layer, in scientific research, systematic observations and other activities pertinent to the objectives of this Convention, and make use as appropriate of information from these bodies and committees;
 - (k) Consider and undertake any additional action that may be required for the achievement of the purposes of this Convention.
5. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State not party to this Convention, may be represented at meetings of the Conference of the Parties by observers. Any body or agency, whether national or international, governmental or non-governmental, qualified in fields relating to the protection of the ozone layer which has informed the secretariat of its wish to be represented at a meeting of the Conference of the Parties as an observer may be admitted unless at least one-third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

Article 7: Secretariat

1. The functions of the secretariat shall be:
- (a) To arrange for and service meetings provided for in articles 6, 8, 9 and 10;
 - (b) To prepare and transmit reports based upon information received in accordance with articles 4 and 5, as well as upon information derived from meetings of subsidiary bodies established under article 6;
 - (c) To perform the functions assigned to it by any protocol;

- (d) To prepare reports on its activities carried out in implementation of its functions under this Convention and present them to the Conference of the Parties;
 - (e) To ensure the necessary co-ordination with other relevant international bodies, and in particular to enter into such administrative and contractual arrangements as may be required for the effective discharge of its functions;
 - (f) To perform such other functions as may be determined by the Conference of the Parties.
2. The secretariat functions will be carried out on an interim basis by the United Nations Environment Programme until the completion of the first ordinary meeting of the Conference of the Parties held pursuant to article 6. At its first ordinary meeting, the Conference of the Parties shall designate the secretariat from amongst those existing competent international organizations which have signified their willingness to carry out the secretariat functions under this Convention.

Article 8: Adoption of protocols

1. The Conference of the Parties may at a meeting adopt protocols pursuant to Article 2.
2. The text of any proposed protocol shall be communicated to the Parties by the secretariat at least six months before such a meeting.

Article 9: Amendment of the Convention or protocols

1. Any Party may propose amendments to this Convention or to any protocol. Such amendments shall take due account, *inter alia*, of relevant scientific and technical considerations.
2. Amendments to this Convention shall be adopted at a meeting of the Conference of the Parties. Amendments to any protocol shall be adopted at a meeting of the Parties to the protocol in question. The text of any proposed amendment to this Convention or to any protocol, except as may otherwise be provided in such protocol,

shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to this Convention for information.

3. The Parties shall make every effort to reach agreement on any proposed amendment to this Convention by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting, and shall be submitted by the Depositary to all Parties for ratification, approval or acceptance.
4. The procedure mentioned in paragraph 3 above shall apply to amendments to any protocol, except that a two-thirds majority of the parties to that protocol present and voting at the meeting shall suffice for their adoption.
5. Ratification, approval or acceptance of amendments shall be notified to the Depositary in writing. Amendments adopted in accordance with paragraphs 3 or 4 above shall enter into force between parties having accepted them on the ninetieth day after the receipt by the Depositary of notification of their ratification, approval or acceptance by at least three-fourths of the Parties to this Convention or by at least two-thirds of the parties to the protocol concerned, except as may otherwise be provided in such protocol. Thereafter the amendments shall enter into force for any other Party on the ninetieth day after that Party deposits its instrument of ratification, approval or acceptance of the amendments.
6. For the purposes of this article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

Article 10: Adoption and amendment of annexes

1. The annexes to this Convention or to any protocol shall form an integral part of this Convention or of such protocol, as the case may be, and, unless expressly provided otherwise, a reference to this Convention or its protocols constitutes at the same time a reference

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to any annexes thereto. Such annexes shall be restricted to scientific, technical and administrative matters.

2. Except as may be otherwise provided in any protocol with respect to its annexes, the following procedure shall apply to the proposal, adoption and entry into force of additional annexes to this Convention or of annexes to a protocol:
 - (a) Annexes to this Convention shall be proposed and adopted according to the procedure laid down in article 9, paragraphs 2 and 3, while annexes to any protocol shall be proposed and adopted according to the procedure laid down in article 9, paragraphs 2 and 4;
 - (b) Any party that is unable to approve an additional annex to this Convention or annex to any protocol to which it is party shall so notify the Depositary, in writing, within six months from the date of the communication of the adoption by the Depositary. The Depositary shall without delay notify all Parties of any such notification received. A Party may at any time substitute an acceptance for a previous declaration of objection and the annexes shall thereupon enter into force for that Party;
 - (c) On the expiry of six months from the date of the circulation of the communication by the Depositary, the annex shall become effective for all Parties to this Convention or to any protocol concerned which have not submitted a notification in accordance with the provision of subparagraph (b) above.
3. The proposal, adoption and entry into force of amendments to annexes to this Convention or to any protocol shall be subject to the same procedure as for the proposal, adoption and entry into force of annexes to the Convention or annexes to a protocol. Annexes and amendments thereto shall take due account, *inter alia*, of relevant scientific and technical considerations.
4. If an additional annex or an amendment to an annex involves an amendment to this Convention or to any protocol, the additional annex or amended annex shall not enter into force until such time as the amendment to this Convention or to the protocol concerned enters into force.

Article 11: Settlement of disputes

1. In the event of a dispute between Parties concerning the interpretation or application of this Convention, the parties concerned shall seek solution by negotiation.
2. If the parties concerned cannot reach agreement by negotiation, they may jointly seek the good offices of, or request mediation by, a third party.
3. When ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, a State or regional economic integration organization may declare in writing to the Depositary that for a dispute not resolved in accordance with paragraph 1 or paragraph 2 above, it accepts one or both of the following means of dispute settlement as compulsory:
 - (a) Arbitration in accordance with procedures to be adopted by the Conference of the Parties at its first ordinary meeting;
 - (b) Submission of the dispute to the International Court of Justice.
4. If the parties have not, in accordance with paragraph 3 above, accepted the same or any procedure, the dispute shall be submitted to conciliation in accordance with paragraph 5 below unless the parties otherwise agree.
5. A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall be composed of an equal number of members appointed by each party concerned and a chairman chosen jointly by the members appointed by each party. The commission shall render a final and recommendatory award, which the parties shall consider in good faith.
6. The provisions of this Article shall apply with respect to any protocol except as provided in the protocol concerned.

Article 12: Signature

This Convention shall be open for signature by States and by regional economic integration organizations at the Federal Ministry for Foreign Affairs of the Republic of Austria in Vienna from 22 March 1985 to 21

September 1985, and at United Nations Headquarters in New York from 22 September 1985 to 21 March 1986.

Article 13: Ratification, acceptance or approval

1. This Convention and any protocol shall be subject to ratification, acceptance or approval by States and by regional economic integration organizations. Instruments of ratification, acceptance or approval shall be deposited with the Depositary.
2. Any organization referred to in paragraph 1 above which becomes a Party to this Convention or any protocol without any of its member States being a Party shall be bound by all the obligations under the Convention or the protocol, as the case may be. In the case of such organizations, one or more of whose member States is a Party to the Convention or relevant protocol, the organization and its member States shall decide on their respective responsibilities for the performance of their obligation under the Convention or protocol, as the case may be. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention or relevant protocol concurrently.
3. In their instruments of ratification, acceptance or approval, the organizations referred to in paragraph 1 above shall declare the extent of their competence with respect to the matters governed by the Convention or the relevant protocol. These organizations shall also inform the Depositary of any substantial modification in the extent of their competence.

Article 14: Accession

1. This Convention and any protocol shall be open for accession by States and by regional economic integration organizations from the date on which the Convention or the protocol concerned is closed for signature. The instruments of accession shall be deposited with the Depositary.
2. In their instruments of accession, the organizations referred to in paragraph 1 above shall declare the extent of their competence with

respect to the matters governed by the Convention or the relevant protocol. These organizations shall also inform the Depositary of any substantial modification in the extent of their competence.

3. The provisions of article 13, paragraph 2, shall apply to regional economic integration organizations which accede to this Convention or any protocol.

Article 15: Right to vote

1. Each Party to this Convention or to any protocol shall have one vote.
2. Except as provided for in paragraph 1 above, regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States which are Parties to the Convention or the relevant protocol. Such organizations shall not exercise their right to vote if their member States exercise theirs, and vice versa.

Article 16: Relationship between the Convention and its protocols

1. A State or a regional economic integration organization may not become a party to a protocol unless it is, or becomes at the same time, a Party to the Convention.
2. Decisions concerning any protocol shall be taken only by the parties to the protocol concerned.

Article 17: Entry into force

1. This Convention shall enter into force on the ninetieth day after the date of deposit of the twentieth instrument of ratification, acceptance, approval or accession.
2. Any protocol, except as otherwise provided in such protocol, shall enter into force on the ninetieth day after the date of deposit of the eleventh instrument of ratification, acceptance or approval of such protocol or accession thereto.

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3. For each Party which ratifies, accepts or approves this Convention or accedes thereto after the deposit of the twentieth instrument of ratification, acceptance, approval or accession, it shall enter into force on the ninetieth day after the date of deposit by such Party of its instrument of ratification, acceptance, approval or accession.
4. Any protocol, except as otherwise provided in such protocol, shall enter into force for a party that ratifies, accepts or approves that protocol or accedes thereto after its entry into force pursuant to paragraph 2 above, on the ninetieth day after the date on which that party deposits its instrument of ratification, acceptance, approval or accession, or on the date which the Convention enters into force for that Party, whichever shall be the later.
5. For the purposes of paragraphs 1 and 2 above, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by member States of such organization.

Article 18: Reservations

No reservations may be made to this Convention.

Article 19: Withdrawal

1. At any time after four years from the date on which this Convention has entered into force for a Party, that Party may withdraw from the Convention by giving written notification to the Depositary.
2. Except as may be provided in any protocol, at any time after four years from the date on which such protocol has entered into force for a party, that party may withdraw from the protocol by giving written notification to the Depositary.
3. Any such withdrawal shall take effect upon expiry of one year after the date of its receipt by the Depositary, or on such later date as may be specified in the notification of the withdrawal.
4. Any Party which withdraws from this Convention shall be considered as also having withdrawn from any protocol to which it is party.

Article 20: Depositary

1. The Secretary-General of the United Nations shall assume the functions of depositary of this Convention and any protocols.
2. The Depositary shall inform the Parties, in particular, of:
 - (a) The signature of this Convention and of any protocol, and the deposit of instruments of ratification, acceptance, approval or accession in accordance with articles 13 and 14;
 - (b) The date on which the Convention and any protocol will come into force in accordance with article 17;
 - (c) Notifications of withdrawal made in accordance with article 19;
 - (d) Amendments adopted with respect to the Convention and any protocol, their acceptance by the parties and their date of entry into force in accordance with article 9;
 - (e) All communications relating to the adoption and approval of annexes and to the amendment of annexes in accordance with article 10;
 - (f) Notifications by regional economic integration organizations of the extent of their competence with respect to matters governed by this Convention and any protocols, and of any modifications thereof.
 - (g) Declarations made in accordance with article 11, paragraph 3.

Article 21: Authentic texts

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

DONE AT VIENNA ON THE 22ND DAY OF MARCH 1985

Annex I: Research and systematic observations

1. The Parties to the Convention recognize that the major scientific issues are:
 - (a) Modification of the ozone layer which would result in a change in the amount of solar ultra-violet radiation having biological effects (UV-B) that reaches the Earth's surface and the potential consequences for human health, for organisms, ecosystems and materials useful to mankind;
 - (b) Modification of the vertical distribution of ozone, which could change the temperature structure of the atmosphere and the potential consequences for weather and climate.
2. The Parties to the Convention, in accordance with article 3, shall co-operate in conducting research and systematic observations and in formulating recommendations for future research and observation in such areas as:
 - (a) *Research into the physics and chemistry of the atmosphere*
 - (i) Comprehensive theoretical models: further development of models which consider the interaction between radiative, dynamic and chemical processes; studies of the simultaneous effects of various man-made and naturally occurring species upon atmospheric ozone; interpretation of satellite and non-satellite measurement data sets; evaluation of trends in atmospheric and geophysical parameters, and the development of methods for attributing changes in these parameters to specific causes;
 - (ii) Laboratory studies of: rate coefficients, absorption cross-sections and mechanisms of tropospheric and stratospheric chemical and photochemical processes; spectroscopic data to support field measurements in all relevant spectral regions;
 - (iii) Field measurements: the concentration and fluxes of key source gases of both natural and anthropogenic origin; atmospheric dynamics studies; simultaneous

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- measurements of photochemically-related species down to the planetary boundary layer, using *in situ* and remote sensing instruments; intercomparison of different sensors, including co-ordinated correlative measures for satellite instrumentation; three-dimensional fields of key atmospheric trace constituents, solar spectral flux and meteorological parameters;
- (iv) Instrument development, including satellite and non-satellite sensors for atmospheric trace constituents, solar flux and meteorological parameters;
- (b) *Research into health, biological and photodegradation effects*
- (i) The relationship between human exposure to visible and ultra-violet solar radiation and (a) the development of both non-melanoma and melanoma skin cancer and (b) the effects on the immunological system;
- (ii) Effects of UV-B radiation, including the wavelength dependence, upon (a) agricultural crops, forests and other terrestrial ecosystems and (b) the aquatic food web and fisheries, as well as possible inhibition of oxygen production by marine phytoplankton;
- (iii) The mechanisms by which UV-B radiation acts on biological materials, species and ecosystems, including: the relationship between dose, dose rate, and response; photorepair, adaptation, and protection;
- (iv) Studies of biological action spectra and the spectral response using polychromatic radiation in order to include possible interactions of the various wavelength regions;
- (v) The influence of UV-B radiation on: the sensitivities and activities of biological species important to the biospheric balance; primary processes such as photosynthesis and biosynthesis;
- (vi) The influence of UV-B radiation on the photodegradation of pollutants, agricultural chemicals and other materials;
- (c) *Research on effects on climate*

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- (i) Theoretical and observational studies of the radiative effects of ozone and other trace species and the impact on climate parameters, such as land and ocean surface temperatures, precipitation patterns, the exchange between the troposphere and stratosphere;
 - (ii) The investigation of the effects of such climate impacts on various aspects of human activity;
- (d) *Systematic observation on:*
- (i) The status of the ozone layer (i.e. the spatial and temporal variability of the total column content and vertical distribution) by making the Global Ozone Observing System, based on the integration of satellite and ground-based systems, fully operational;
 - (ii) The tropospheric and stratospheric concentrations of source gases for the HO_x, NO_x, ClO_x and carbon families;
 - (iii) The temperature from the ground to the mesosphere, utilizing both ground-based and satellite systems;
 - (iv) Wavelength-resolved solar flux reaching, and thermal radiation leaving, the Earth's atmosphere, utilizing satellite measurements;
 - (v) Wavelength-resolved solar flux reaching the Earth's surface in the ultra-violet range having biological effects (UV-B);
 - (vi) Aerosol properties and distribution from the ground to the mesosphere, utilizing ground-based, airborne and satellite systems;
 - (vii) Climatically important variables by the maintenance of programmes of high-quality meteorological surface measurements;
 - (viii) Trace species, temperatures, solar flux and aerosols utilizing improved methods for analyzing global data.
3. The Parties to the Convention shall co-operate, taking into account the particular needs of the developing countries, in promoting the

appropriate scientific and technical training required to participate in the research and systematic observations outlined in this annex. Particular emphasis should be given to the intercalibration of observational instrumentation and methods with a view to generating comparable or standardized scientific data sets.

4. The following chemical substances of natural and anthropogenic origin, not listed in order of priority, are thought to have the potential to modify the chemical and physical properties of the ozone layer.

(a) **Carbon substances**

(i) *Carbon monoxide (CO)*

Carbon monoxide has significant natural and anthropogenic sources, and is thought to play a major direct role in tropospheric photochemistry, and an indirect role in stratospheric photochemistry.

(ii) *Carbon dioxide (CO₂)*

Carbon dioxide has significant natural and anthropogenic sources, and affects stratospheric ozone by influencing the thermal structure of the atmosphere.

(iii) *Methane (CH₄)*

Methane has both natural and anthropogenic sources, and affects both tropospheric and stratospheric ozone.

(iv) *Non-methane hydrocarbon species*

Non-methane hydrocarbon species, which consist of a large number of chemical substances, have both natural and anthropogenic sources, and play a direct role in tropospheric photochemistry and an indirect role in stratospheric photochemistry.

(b) **Nitrogen substances**

(i) *Nitrous oxide (N₂O)*

The dominant sources of N₂O are natural, but anthropogenic contributions are becoming increasingly important. Nitrous oxide is the primary source of

stratospheric NO_x , which play a vital role in controlling the abundance of stratospheric ozone.

(ii) *Nitrogen oxides (NO_x)*

Ground-level sources of NO_x play a major direct role only in tropospheric photochemical processes and an indirect role in stratosphere photochemistry, whereas injection of NO_x close to the tropopause may lead directly to a change in upper tropospheric and stratospheric ozone.

(c) **Chlorine substances**

- (i) *Fully halogenated alkanes, e.g. CCl_4 , CFCl_3 (CFC-11), CF_2Cl_2 (CFC-12), $\text{C}_2\text{F}_3\text{Cl}_3$ (CFC-113), $\text{C}_2\text{F}_4\text{Cl}_2$ (CFC-114)*

Fully halogenated alkanes are anthropogenic and act as a source of ClO_x which plays a vital role in ozone photochemistry, especially in the 30–50 km altitude region.

- (ii) *Partially halogenated alkanes, e.g. CH_3Cl , CHF_2Cl (CFC-22), CH_3CCl_3 , CHFCl_2 (CFC-21)*

The sources of CH_3Cl are natural, whereas the other partially halogenated alkanes mentioned above are anthropogenic in origin. These gases also act as a source of stratospheric ClO_x

(d) **Bromine substances**

Fully halogenated alkanes, e.g. CF_3Br

These gases are anthropogenic and act as a source of BrO_x , which behaves in a manner similar to ClO_x .

(e) **Hydrogen substances**

- (i) *Hydrogen (H_2)*

Hydrogen, the source of which is natural and anthropogenic, plays a minor role in stratospheric photochemistry.

- (ii) *Water (H_2O)*

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Water, the source of which is natural, plays a vital role in both tropospheric and stratospheric photochemistry. Local sources of water vapor in the stratosphere include the oxidation of methane and, to a lesser extent, of hydrogen.

Annex II: Information exchange

1. The Parties to the Convention recognize that the collection and sharing of information is an important means of implementing the objectives of this Convention and of assuring that any actions that may be taken are appropriate and equitable. Therefore, Parties shall exchange scientific, technical, socio-economic, business, commercial and legal information.
2. The Parties to the Convention, in deciding what information is to be collected and exchanged, should take into account the usefulness of the information and the costs of obtaining it. The Parties further recognize that co-operation under this annex has to be consistent with national laws, regulations and practices regarding patents, trade secrets, and protection of confidential and proprietary information.
3. *Scientific information*
This includes information on:
 - (a) Planned and ongoing research, both governmental and private, to facilitate the co-ordination of research programmes so as to make the most effective use of available national and international resources;
 - (b) The emission data needed for research;
 - (c) Scientific results published in peer-reviewed literature on the understanding of the physics and chemistry of the Earth's atmosphere and of its susceptibility to change, in particular on the state of the ozone layer and effects on human health, environment and climate which would result from changes on all time-scales in either the total column content or the vertical distribution of ozone;
 - (d) The assessment of research results and the recommendation for future research.
4. *Technical information*
This includes information on:

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- (a) The availability and cost of chemical substitutes and of alternative technologies to reduce the emissions of ozone-modifying substances and related planned and ongoing research;
- (b) The limitations and any risks involved in using chemical or other substitutes and alternative technologies.

5. *Socio-economic and commercial information on the substances referred to in annex I*

This includes information on:

- (a) Production and production capacity;
- (b) Use and use patterns;
- (c) Imports/exports;
- (d) The costs, risks and benefits of human activities which may indirectly modify the ozone layer and of the impacts of regulatory actions taken or being considered to control these activities.

6. *Legal information*

This includes information on:

- (a) National laws, administrative measures and legal research relevant to the protection of the ozone layer;
- (b) International agreements, including bilateral agreements, relevant to the protection of the ozone layer;
- (c) Methods and terms of licensing and availability of patents relevant to the protection of the ozone layer.

Declarations

(made at the time of adoption of the Final Act of the Conference of Plenipotentiaries on the Protection of the Ozone Layer ^{/})*

1. The delegations of Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Federal Republic of, Italy, Netherlands, New Zealand, Norway, Sweden, Switzerland, and United Kingdom of Great Britain and Northern Ireland express their regret at the absence from the Vienna Convention for the Protection of the Ozone Layer of any provision for the compulsory settlement of disputes by third parties, at the request of one party. Consistently with their traditional support for such a procedure, these delegations appeal to all Parties to the Convention to make use of the possibility of a declaration under article 11, paragraph 3, of the Convention.
2. The delegation of Egypt reiterates the importance attached by its Government to the international and national efforts to protect the environment, including the protection of the ozone layer. For that reason, it has participated from the outset in the preparatory work for the Conference of Plenipotentiaries on the Protection of the Ozone Layer, and in the adoption of the Convention and resolutions. While concurring with the consensus on article 1 of the Convention, the delegation of Egypt understands paragraph 6 of that article as being applicable to all regional organizations, including the Organization of African Unity and the League of Arab States, provided they fulfil the conditions laid down in that article, namely, that they have competence in respect of matters governed by the Convention and have been duly authorized by their member States in accordance with their internal rules of procedure. While concurring with the consensus on article 2 of the Convention, the delegation of Egypt states that the first sentence of paragraph 2 of that article should be read in the light of the third preambular paragraph. While concurring with the consensus on Resolution No.

^{*/} The Conference agreed that the declarations contained in paragraphs 1 to 3, as submitted on 21 March 1985, and the declarations contained in paragraphs 4 and 5, as submitted on 22 March 1985, should be appended to the Final Act.

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- 1 on Institutional and Financial Arrangements, the delegation of Egypt states that its approval of the third preambular paragraph of that resolution is without prejudice to its position on the method of apportioning contributions among the member States, with particular reference to option 2, which it had supported during the discussions on preparatory document UNEP/WG.94/13, whereby 80 per cent of the costs would be covered by the industrialized countries and the remaining 20 per cent apportioned among the member States on the basis of the United Nations scale of assessment.
3. With regard to Resolution No. 2 on the Protocol Concerning Chlorofluorocarbons, the delegation of Japan is of the opinion that a decision whether or not to continue work on a protocol should await the results of the work of the Co-ordinating Committee on the Ozone Layer. Secondly, with regard to paragraph 6 of the above-mentioned resolution, the delegation of Japan is of the opinion that each country should itself decide how to control emissions of chlorofluorocarbons.
 4. The delegation of Spain declares that, in accordance with the interpretation by the President of the Conference in his statement of 21 March 1985, its Government understands paragraph 6 of the Resolution on a Protocol Concerning Chlorofluorocarbons as being addressed exclusively to the individual countries themselves, which are urged to control their limits of production or use, and not to third countries or to regional organizations with respect to such countries.
 5. The delegation of the United States of America declares that it understands article 15 of the Convention to mean that regional economic integration organizations, none of whose member States are Parties to the Convention or relevant Protocol, shall have one vote each. It further understands that article 15 does not allow any double voting by regional economic integration organizations and their member States, that is, regional economic integration organizations may never vote in addition to their member States which are party to the Convention or relevant protocol, and vice versa.

This publication contains the text of the Vienna Convention for the Protection of the Ozone Layer as adopted by 28 countries on 22 March 1985 at the Conference of Plenipotentiaries on the Protection of the Ozone Layer and as deposited with the Secretary-General of the United Nations.

The Vienna Convention encourages intergovernmental cooperation on scientific research, systematic observation of the ozone layer, monitoring of CFC production and the exchange of information. Although it contained no commitment to take any action to reduce CFC production or consumption, the Vienna Convention was nevertheless an important milestone: nations agreed in principle to tackle a global environmental problem before its effects were felt or its existence scientifically proven, probably the first example of the acceptance of the “precautionary principle” in a major international negotiation. Also, the important 1987 Montreal Protocol on Substances that Deplete the Ozone Layer was negotiated under this Convention.

The Vienna Convention continues to give guidance on the monitoring, calibration and archiving of measurements of stratospheric and tropospheric ozone, and of vertical ozone profiles, UV-B radiation, other atmospheric trace species and aerosols. It gives guidance also on the related research activities that are essential to understanding the problem of ozone-layer depletion and the interactions between the ozone layer and climate.

As of November 2001, 184 Parties had ratified the Vienna Convention.

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The Vienna Convention for the Protection of the Ozone Layer

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ภาคผนวก ข

The Montreal Protocol on Substances that Deplete the Ozone Layer

**The Montreal Protocol on Substances
that Deplete the Ozone Layer**

as either adjusted and/or amended in

London 1990

Copenhagen 1992

Vienna 1995

Montreal 1997

Beijing 1999



UNEP

Ozone Secretariat

United Nations Environment Programme

The Montreal Protocol on Substances that Deplete the Ozone Layer

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Preamble

The Parties to this Protocol,

Being Parties to the Vienna Convention for the Protection of the Ozone Layer,

Mindful of their obligation under that Convention to take appropriate measures to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer,

Recognizing that world-wide emissions of certain substances can significantly deplete and otherwise modify the ozone layer in a manner that is likely to result in adverse effects on human health and the environment,

Conscious of the potential climatic effects of emissions of these substances,

Aware that measures taken to protect the ozone layer from depletion should be based on relevant scientific knowledge, taking into account technical and economic considerations,

Determined to protect the ozone layer by taking precautionary measures to control equitably total global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of developments in scientific knowledge, taking into account technical and economic considerations and bearing in mind the developmental needs of developing countries,

Acknowledging that special provision is required to meet the needs of developing countries, including the provision of additional financial resources and access to relevant technologies, bearing in mind that the magnitude of funds necessary is predictable, and the funds can be expected to make a substantial difference in the world's ability to address the scientifically established problem of ozone depletion and its harmful effects,

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Noting the precautionary measures for controlling emissions of certain chlorofluorocarbons that have already been taken at national and regional levels,

Considering the importance of promoting international co-operation in the research, development and transfer of alternative technologies relating to the control and reduction of emissions of substances that deplete the ozone layer, bearing in mind in particular the needs of developing countries,

HAVE AGREED AS FOLLOWS:

Article 1: Definitions

For the purposes of this Protocol:

1. “Convention” means the Vienna Convention for the Protection of the Ozone Layer, adopted on 22 March 1985.
2. “Parties” means, unless the text otherwise indicates, Parties to this Protocol.
3. “Secretariat” means the Secretariat of the Convention.
4. “Controlled substance” means a substance in Annex A, Annex B, Annex C or Annex E to this Protocol, whether existing alone or in a mixture. It includes the isomers of any such substance, except as specified in the relevant Annex, but excludes any controlled substance or mixture which is in a manufactured product other than a container used for the transportation or storage of that substance.
5. “Production” means the amount of controlled substances produced, minus the amount destroyed by technologies to be approved by the Parties and minus the amount entirely used as feedstock in the manufacture of other chemicals. The amount recycled and reused is not to be considered as “production”.
6. “Consumption” means production plus imports minus exports of controlled substances.

7. “Calculated levels” of production, imports, exports and consumption means levels determined in accordance with Article 3.
8. “Industrial rationalization” means the transfer of all or a portion of the calculated level of production of one Party to another, for the purpose of achieving economic efficiencies or responding to anticipated shortfalls in supply as a result of plant closures.

Article 2: Control Measures

1. *Incorporated in Article 2A.*
2. *Replaced by Article 2B.*
3. *Replaced by Article 2A.*
4. *Replaced by Article 2A.*
5. Any Party may, for one or more control periods, transfer to another Party any portion of its calculated level of production set out in Articles 2A to 2F, and Article 2H, provided that the total combined calculated levels of production of the Parties concerned for any group of controlled substances do not exceed the production limits set out in those Articles for that group. Such transfer of production shall be notified to the Secretariat by each of the Parties concerned, stating the terms of such transfer and the period for which it is to apply.
- 5 bis. Any Party not operating under paragraph 1 of Article 5 may, for one or more control periods, transfer to another such Party any portion of its calculated level of consumption set out in Article 2F, provided that the calculated level of consumption of controlled substances in Group I of Annex A of the Party transferring the portion of its calculated level of consumption did not exceed 0.25 kilograms per capita in 1989 and that the total combined calculated levels of consumption of the Parties concerned do not exceed the consumption limits set out in

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Article 2F. Such transfer of consumption shall be notified to the Secretariat by each of the Parties concerned, stating the terms of such transfer and the period for which it is to apply.

6. Any Party not operating under Article 5, that has facilities for the production of Annex A or Annex B controlled substances under construction, or contracted for, prior to 16 September 1987, and provided for in national legislation prior to 1 January 1987, may add the production from such facilities to its 1986 production of such substances for the purposes of determining its calculated level of production for 1986, provided that such facilities are completed by 31 December 1990 and that such production does not raise that Party's annual calculated level of consumption of the controlled substances above 0.5 kilograms per capita.
7. Any transfer of production pursuant to paragraph 5 or any addition of production pursuant to paragraph 6 shall be notified to the Secretariat, no later than the time of the transfer or addition.
8.
 - (a) Any Parties which are Member States of a regional economic integration organization as defined in Article 1 (6) of the Convention may agree that they shall jointly fulfil their obligations respecting consumption under this Article and Articles 2A to 2I provided that their total combined calculated level of consumption does not exceed the levels required by this Article and Articles 2A to 2I.
 - (b) The Parties to any such agreement shall inform the Secretariat of the terms of the agreement before the date of the reduction in consumption with which the agreement is concerned.
 - (c) Such agreement will become operative only if all Member States of the regional economic integration organization and the organization concerned are Parties to the Protocol and have notified the Secretariat of their manner of implementation.

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9. (a) Based on the assessments made pursuant to Article 6, the Parties may decide whether:
- (i) Adjustments to the ozone depleting potentials specified in Annex A, Annex B, Annex C and/or Annex E should be made and, if so, what the adjustments should be; and
 - (ii) Further adjustments and reductions of production or consumption of the controlled substances should be undertaken and, if so, what the scope, amount and timing of any such adjustments and reductions should be;
- (b) Proposals for such adjustments shall be communicated to the Parties by the Secretariat at least six months before the meeting of the Parties at which they are proposed for adoption;
- (c) In taking such decisions, the Parties shall make every effort to reach agreement by consensus. If all efforts at consensus have been exhausted, and no agreement reached, such decisions shall, as a last resort, be adopted by a two-thirds majority vote of the Parties present and voting representing a majority of the Parties operating under Paragraph 1 of Article 5 present and voting and a majority of the Parties not so operating present and voting;
- (d) The decisions, which shall be binding on all Parties, shall forthwith be communicated to the Parties by the Depositary. Unless otherwise provided in the decisions, they shall enter into force on the expiry of six months from the date of the circulation of the communication by the Depositary.
10. Based on the assessments made pursuant to Article 6 of this Protocol and in accordance with the procedure set out in Article 9 of the Convention, the Parties may decide:

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- (a) whether any substances, and if so which, should be added to or removed from any annex to this Protocol, and
 - (b) the mechanism, scope and timing of the control measures that should apply to those substances;
11. Notwithstanding the provisions contained in this Article and Articles 2A to 2I Parties may take more stringent measures than those required by this Article and Articles 2A to 2I.

Article 2A: CFCs

1. Each Party shall ensure that for the twelve-month period commencing on the first day of the seventh month following the date of entry into force of this Protocol, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex A does not exceed its calculated level of consumption in 1986. By the end of the same period, each Party producing one or more of these substances shall ensure that its calculated level of production of the substances does not exceed its calculated level of production in 1986, except that such level may have increased by no more than ten per cent based on the 1986 level. Such increase shall be permitted only so as to satisfy the basic domestic needs of the Parties operating under Article 5 and for the purposes of industrial rationalization between Parties.
2. Each Party shall ensure that for the period from 1 July 1991 to 31 December 1992 its calculated levels of consumption and production of the controlled substances in Group I of Annex A do not exceed 150 per cent of its calculated levels of production and consumption of those substances in 1986; with effect from 1 January 1993, the twelve-month control period for these controlled substances shall run from 1 January to 31 December each year.

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3. Each Party shall ensure that for the twelve-month period commencing on 1 January 1994, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex A does not exceed, annually, twenty-five per cent of its calculated level of consumption in 1986. Each Party producing one or more of these substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed, annually, twenty-five per cent of its calculated level of production in 1986. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1986.
4. Each Party shall ensure that for the twelve-month period commencing on 1 January 1996, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex A does not exceed zero. Each Party producing one or more of these substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed zero. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by a quantity equal to the annual average of its production of the controlled substances in Group I of Annex A for basic domestic needs for the period 1995 to 1997 inclusive. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.
5. Each Party shall ensure that for the twelve-month period commencing on 1 January 2003 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex A for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed eighty per cent of the annual

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- average of its production of those substances for basic domestic needs for the period 1995 to 1997 inclusive.
6. Each Party shall ensure that for the twelve-month period commencing on 1 January 2005 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex A for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed fifty per cent of the annual average of its production of those substances for basic domestic needs for the period 1995 to 1997 inclusive.
 7. Each Party shall ensure that for the twelve-month period commencing on 1 January 2007 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex A for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed fifteen per cent of the annual average of its production of those substances for basic domestic needs for the period 1995 to 1997 inclusive.
 8. Each Party shall ensure that for the twelve-month period commencing on 1 January 2010 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex A for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed zero.
 9. For the purposes of calculating basic domestic needs under paragraphs 4 to 8 of this Article, the calculation of the annual average of production by a Party includes any production entitlements that it has transferred in accordance with paragraph 5 of Article 2, and excludes any production entitlements that it has acquired in accordance with paragraph 5 of Article 2.

Article 2B: Halons

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 1992, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group II of Annex A does not exceed, annually, its calculated level of consumption in 1986. Each Party producing one or more of these substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed, annually, its calculated level of production in 1986. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1986.
2. Each Party shall ensure that for the twelve-month period commencing on 1 January 1994, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group II of Annex A does not exceed zero. Each Party producing one or more of these substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed zero. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may, until 1 January 2002 exceed that limit by up to fifteen per cent of its calculated level of production in 1986; thereafter, it may exceed that limit by a quantity equal to the annual average of its production of the controlled substances in Group II of Annex A for basic domestic needs for the period 1995 to 1997 inclusive. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.
3. Each Party shall ensure that for the twelve-month period commencing on 1 January 2005 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group II of Annex A for the basic

domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed fifty per cent of the annual average of its production of those substances for basic domestic needs for the period 1995 to 1997 inclusive.

4. Each Party shall ensure that for the twelve-month period commencing on 1 January 2010 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group II of Annex A for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed zero.

Article 2C: Other fully halogenated CFCs

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 1993, its calculated level of consumption of the controlled substances in Group I of Annex B does not exceed, annually, eighty per cent of its calculated level of consumption in 1989. Each Party producing one or more of these substances shall, for the same period, ensure that its calculated level of production of the substances does not exceed, annually, eighty per cent of its calculated level of production in 1989. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1989.
2. Each Party shall ensure that for the twelve-month period commencing on 1 January 1994, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex B does not exceed, annually, twenty-five per cent of its calculated level of consumption in 1989. Each Party producing one or more of these substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed, annually, twenty-five per cent of its calculated level of production in 1989. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of

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Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1989.

3. Each Party shall ensure that for the twelve-month period commencing on 1 January 1996, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex B does not exceed zero. Each Party producing one or more of these substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed zero. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may, until 1 January 2003 exceed that limit by up to fifteen per cent of its calculated level of production in 1989; thereafter, it may exceed that limit by a quantity equal to eighty per cent of the annual average of its production of the controlled substances in Group I of Annex B for basic domestic needs for the period 1998 to 2000 inclusive. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.
4. Each Party shall ensure that for the twelve-month period commencing on 1 January 2007 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex B for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed fifteen per cent of the annual average of its production of those substances for basic domestic needs for the period 1998 to 2000 inclusive.
5. Each Party shall ensure that for the twelve-month period commencing on 1 January 2010 and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex B for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed zero.

Article 2D: Carbon tetrachloride

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 1995, its calculated level of consumption of the controlled substance in Group II of Annex B does not exceed, annually, fifteen per cent of its calculated level of consumption in 1989. Each Party producing the substance shall, for the same period, ensure that its calculated level of production of the substance does not exceed, annually, fifteen per cent of its calculated level of production in 1989. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1989.
2. Each Party shall ensure that for the twelve-month period commencing on 1 January 1996, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substance in Group II of Annex B does not exceed zero. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed zero. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to fifteen per cent of its calculated level of production in 1989. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.

Article 2E: 1,1,1-Trichloroethane (Methyl chloroform)

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 1993, its calculated level of consumption of the controlled substance in Group III of Annex B does not exceed, annually, its calculated level of consumption in 1989. Each Party producing the substance

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- shall, for the same period, ensure that its calculated level of production of the substance does not exceed, annually, its calculated level of production in 1989. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1989.
2. Each Party shall ensure that for the twelve-month period commencing on 1 January 1994, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substance in Group III of Annex B does not exceed, annually, fifty per cent of its calculated level of consumption in 1989. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed, annually, fifty per cent of its calculated level of production in 1989. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1989.
 3. Each Party shall ensure that for the twelve-month period commencing on 1 January 1996, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substance in Group III of Annex B does not exceed zero. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed zero. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to fifteen per cent of its calculated level of production for 1989. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.

Article 2F: Hydrochlorofluorocarbons

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 1996, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed, annually, the sum of:
 - (a) Two point eight per cent of its calculated level of consumption in 1989 of the controlled substances in Group I of Annex A; and
 - (b) Its calculated level of consumption in 1989 of the controlled substances in Group I of Annex C.
2. Each Party shall ensure that for the twelve month period commencing on 1 January 2004, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed, annually, sixty-five per cent of the sum referred to in paragraph 1 of this Article.
3. Each Party shall ensure that for the twelve-month period commencing on 1 January 2010, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed, annually, thirty-five per cent of the sum referred to in paragraph 1 of this Article.
4. Each Party shall ensure that for the twelve-month period commencing on 1 January 2015, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed, annually, ten per cent of the sum referred to in paragraph 1 of this Article.
5. Each Party shall ensure that for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed,

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- annually, zero point five per cent of the sum referred to in paragraph 1 of this Article. Such consumption shall, however, be restricted to the servicing of refrigeration and air conditioning equipment existing at that date.
6. Each Party shall ensure that for the twelve-month period commencing on 1 January 2030, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed zero.
 7. As of 1 January 1996, each Party shall endeavour to ensure that:
 - (a) The use of controlled substances in Group I of Annex C is limited to those applications where other more environmentally suitable alternative substances or technologies are not available;
 - (b) The use of controlled substances in Group I of Annex C is not outside the areas of application currently met by controlled substances in Annexes A, B and C, except in rare cases for the protection of human life or human health; and
 - (c) Controlled substances in Group I of Annex C are selected for use in a manner that minimizes ozone depletion, in addition to meeting other environmental, safety and economic considerations.
 8. Each Party producing one or more of these substances shall ensure that for the twelve-month period commencing on 1 January 2004, and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Group I of Annex C does not exceed, annually, the average of:
 - (a) The sum of its calculated level of consumption in 1989 of the controlled substances in Group I of Annex C and two point eight per cent of its calculated level of

consumption in 1989 of the controlled substances in Group I of Annex A; and

- (b) The sum of its calculated level of production in 1989 of the controlled substances in Group I of Annex C and two point eight per cent of its calculated level of production in 1989 of the controlled substances in Group I of Annex A.

However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to fifteen per cent of its calculated level of production of the controlled substances in Group I of Annex C as defined above.

Article 2G: Hydrobromofluorocarbons

Each Party shall ensure that for the twelve-month period commencing on 1 January 1996, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group II of Annex C does not exceed zero. Each Party producing the substances shall, for the same periods, ensure that its calculated level of production of the substances does not exceed zero. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.

Article 2H: Methyl bromide

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 1995, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substance in Annex E does not exceed, annually, its calculated level of consumption in 1991. Each Party producing the substance shall, for the same period, ensure that its calculated level of production of the substance does not exceed, annually, its calculated level of production in 1991. However, in order to satisfy the basic domestic needs of the

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Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1991.

2. Each Party shall ensure that for the twelve-month period commencing on 1 January 1999, and in the twelve-month period thereafter, its calculated level of consumption of the controlled substance in Annex E does not exceed, annually, seventy-five per cent of its calculated level of consumption in 1991. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed, annually, seventy-five per cent of its calculated level of production in 1991. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1991.
3. Each Party shall ensure that for the twelve-month period commencing on 1 January 2001, and in the twelve-month period thereafter, its calculated level of consumption of the controlled substance in Annex E does not exceed, annually, fifty per cent of its calculated level of consumption in 1991. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed, annually, fifty per cent of its calculated level of production in 1991. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1991.
4. Each Party shall ensure that for the twelve-month period commencing on 1 January 2003, and in the twelve-month period thereafter, its calculated level of consumption of the controlled substance in Annex E does not exceed, annually, thirty per cent of its calculated level of consumption in 1991. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed, annually, thirty per cent of its

calculated level of production in 1991. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may exceed that limit by up to ten per cent of its calculated level of production in 1991.

5. Each Party shall ensure that for the twelve-month period commencing on 1 January 2005, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substance in Annex E does not exceed zero. Each Party producing the substance shall, for the same periods, ensure that its calculated level of production of the substance does not exceed zero. However, in order to satisfy the basic domestic needs of the Parties operating under paragraph 1 of Article 5, its calculated level of production may, until 1 January 2002 exceed that limit by up to fifteen per cent of its calculated level of production in 1991; thereafter, it may exceed that limit by a quantity equal to the annual average of its production of the controlled substance in Annex E for basic domestic needs for the period 1995 to 1998 inclusive. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be critical uses.
- 5 bis.* Each Party shall ensure that for the twelve-month period commencing on 1 January 2005 and in each twelve-month period thereafter, its calculated level of production of the controlled substance in Annex E for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed eighty per cent of the annual average of its production of the substance for basic domestic needs for the period 1995 to 1998 inclusive.
- 5 ter.* Each Party shall ensure that for the twelve-month period commencing on 1 January 2015 and in each twelve-month period thereafter, its calculated level of production of the controlled substance in Annex E for the basic domestic needs of the Parties operating under paragraph 1 of Article 5 does not exceed zero.

6. The calculated levels of consumption and production under this Article shall not include the amounts used by the Party for quarantine and pre-shipment applications.

Article 2I: Bromochloromethane

Each Party shall ensure that for the twelve-month period commencing on 1 January 2002, and in each twelve-month period thereafter, its calculated level of consumption and production of the controlled substance in Group III of Annex C does not exceed zero. This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential.

Article 3: Calculation of control levels

For the purposes of Articles 2, 2A to 2I and 5, each Party shall, for each group of substances in Annex A, Annex B, Annex C or Annex E determine its calculated levels of:

- (a) Production by:
 - (i) multiplying its annual production of each controlled substance by the ozone depleting potential specified in respect of it in Annex A, Annex B, Annex C or Annex E;
 - (ii) adding together, for each such Group, the resulting figures;
- (b) Imports and exports, respectively, by following, *mutatis mutandis*, the procedure set out in subparagraph (a); and
- (c) Consumption by adding together its calculated levels of production and imports and subtracting its calculated level of exports as determined in accordance with subparagraphs (a) and (b). However, beginning on 1 January 1993, any export of controlled substances to

non-Parties shall not be subtracted in calculating the consumption level of the exporting Party.

Article 4: Control of trade with non-Parties

1. As of 1 January 1990, each party shall ban the import of the controlled substances in Annex A from any State not party to this Protocol.
- 1 *bis*. Within one year of the date of the entry into force of this paragraph, each Party shall ban the import of the controlled substances in Annex B from any State not party to this Protocol.
- 1 *ter*. Within one year of the date of entry into force of this paragraph, each Party shall ban the import of any controlled substances in Group II of Annex C from any State not party to this Protocol.
- 1 *qua*. Within one year of the date of entry into force of this paragraph, each Party shall ban the import of the controlled substance in Annex E from any State not party to this Protocol.
- 1 *quin*. As of 1 January 2004, each Party shall ban the import of the controlled substances in Group I of Annex C from any State not party to this Protocol.
- 1 *sex*. Within one year of the date of entry into force of this paragraph, each Party shall ban the import of the controlled substance in Group III of Annex C from any State not party to this Protocol.
2. As of 1 January 1993, each Party shall ban the export of any controlled substances in Annex A to any State not party to this Protocol.

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- 2 *bis*. Commencing one year after the date of entry into force of this paragraph, each Party shall ban the export of any controlled substances in Annex B to any State not party to this Protocol.
- 2 *ter*. Commencing one year after the date of entry into force of this paragraph, each Party shall ban the export of any controlled substances in Group II of Annex C to any State not party to this Protocol.
- 2 *qua*. Commencing one year of the date of entry into force of this paragraph, each Party shall ban the export of the controlled substance in Annex E to any State not party to this Protocol.
- 2 *quin*. As of 1 January 2004, each Party shall ban the export of the controlled substances in Group I of Annex C to any State not party to this Protocol.
- 2 *sex*. Within one year of the date of entry into force of this paragraph, each Party shall ban the export of the controlled substance in Group III of Annex C to any State not party to this Protocol.
3. By 1 January 1992, the Parties shall, following the procedures in Article 10 of the Convention, elaborate in an annex a list of products containing controlled substances in Annex A. Parties that have not objected to the annex in accordance with those procedures shall ban, within one year of the annex having become effective, the import of those products from any State not party to this Protocol.
- 3 *bis*. Within three years of the date of the entry into force of this paragraph, the Parties shall, following the procedures in Article 10 of the Convention, elaborate in an annex a list of products containing controlled substances in Annex B. Parties that have not objected to the annex in accordance with those procedures shall ban, within one year of the annex having become effective, the import of those products from any State not party to this Protocol.

- 3 *ter.* Within three years of the date of entry into force of this paragraph, the Parties shall, following the procedures in Article 10 of the Convention, elaborate in an annex a list of products containing controlled substances in Group II of Annex C. Parties that have not objected to the annex in accordance with those procedures shall ban, within one year of the annex having become effective, the import of those products from any State not party to this Protocol.
4. By 1 January 1994, the Parties shall determine the feasibility of banning or restricting, from States not party to this Protocol, the import of products produced with, but not containing, controlled substances in Annex A. If determined feasible, the Parties shall, following the procedures in Article 10 of the Convention, elaborate in an annex a list of such products. Parties that have not objected to the annex in accordance with those procedures shall ban, within one year of the annex having become effective, the import of those products from any State not party to this Protocol.
- 4 *bis.* Within five years of the date of the entry into force of this paragraph, the Parties shall determine the feasibility of banning or restricting, from States not party to this Protocol, the import of products produced with, but not containing, controlled substances in Annex B. If determined feasible, the Parties shall, following the procedures in Article 10 of the Convention, elaborate in an annex a list of such products. Parties that have not objected to the annex in accordance with those procedures shall ban or restrict, within one year of the annex having become effective, the import of those products from any State not party to this Protocol.
- 4 *ter.* Within five years of the date of entry into force of this paragraph, the Parties shall determine the feasibility of banning or restricting, from States not party to this Protocol, the import of products produced with, but not containing, controlled substances in Group II of Annex C. If determined feasible, the Parties shall, following the procedures in Article 10 of the Convention, elaborate in an annex a list of such products. Parties that have not objected to the annex in

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- accordance with those procedures shall ban or restrict, within one year of the annex having become effective, the import of those products from any State not party to this Protocol.
5. Each Party undertakes to the fullest practicable extent to discourage the export to any State not party to this Protocol of technology for producing and for utilizing controlled substances in Annexes A, B, C and E.
 6. Each Party shall refrain from providing new subsidies, aid, credits, guarantees or insurance programmes for the export to States not party to this Protocol of products, equipment, plants or technology that would facilitate the production of controlled substances in Annexes A, B, C and E.
 7. Paragraphs 5 and 6 shall not apply to products, equipment, plants or technology that improve the containment, recovery, recycling or destruction of controlled substances, promote the development of alternative substances, or otherwise contribute to the reduction of emissions of controlled substances in Annexes A, B, C and E.
 8. Notwithstanding the provisions of this Article, imports and exports referred to in paragraphs 1 to 4 *ter* of this Article may be permitted from, or to, any State not party to this Protocol, if that State is determined, by a meeting of the Parties, to be in full compliance with Article 2, Articles 2A to 2I and this Article, and have submitted data to that effect as specified in Article 7.
 9. For the purposes of this Article, the term “State not party to this Protocol” shall include, with respect to a particular controlled substance, a State or regional economic integration organization that has not agreed to be bound by the control measures in effect for that substance.
 10. By 1 January 1996, the Parties shall consider whether to amend this Protocol in order to extend the measures in this Article to trade in controlled substances in Group I of Annex C and in Annex E with States not party to the Protocol.

Article 4A: Control of trade with Parties

1. Where, after the phase-out date applicable to it for a controlled substance, a Party is unable, despite having taken all practicable steps to comply with its obligation under the Protocol, to cease production of that substance for domestic consumption, other than for uses agreed by the Parties to be essential, it shall ban the export of used, recycled and reclaimed quantities of that substance, other than for the purpose of destruction.
2. Paragraph 1 of this Article shall apply without prejudice to the operation of Article 11 of the Convention and the non-compliance procedure developed under Article 8 of the Protocol.

Article 4B: Licensing

1. Each Party shall, by 1 January 2000 or within three months of the date of entry into force of this Article for it, whichever is the later, establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances in Annexes A, B, C and E.
2. Notwithstanding paragraph 1 of this Article, any Party operating under paragraph 1 of Article 5 which decides it is not in a position to establish and implement a system for licensing the import and export of controlled substances in Annexes C and E, may delay taking those actions until 1 January 2005 and 1 January 2002, respectively.
3. Each Party shall, within three months of the date of introducing its licensing system, report to the Secretariat on the establishment and operation of that system.
4. The Secretariat shall periodically prepare and circulate to all Parties a list of the Parties that have reported to it on their licensing systems and shall forward this information to the

Implementation Committee for consideration and appropriate recommendations to the Parties.

Article 5: Special situation of developing countries

1. Any Party that is a developing country and whose annual calculated level of consumption of the controlled substances in Annex A is less than 0.3 kilograms per capita on the date of the entry into force of the Protocol for it, or any time thereafter until 1 January 1999, shall, in order to meet its basic domestic needs, be entitled to delay for ten years its compliance with the control measures set out in Articles 2A to 2E, provided that any further amendments to the adjustments or Amendment adopted at the Second Meeting of the Parties in London, 29 June 1990, shall apply to the Parties operating under this paragraph after the review provided for in paragraph 8 of this Article has taken place and shall be based on the conclusions of that review.
- 1 *bis*. The Parties shall, taking into account the review referred to in paragraph 8 of this Article, the assessments made pursuant to Article 6 and any other relevant information, decide by 1 January 1996, through the procedure set forth in paragraph 9 of Article 2:
 - (a) With respect to paragraphs 1 to 6 of Article 2F, what base year, initial levels, control schedules and phase-out date for consumption of the controlled substances in Group I of Annex C will apply to Parties operating under paragraph 1 of this Article;
 - (b) With respect to Article 2G, what phase-out date for production and consumption of the controlled substances in Group II of Annex C will apply to Parties operating under paragraph 1 of this Article; and
 - (c) With respect to Article 2H, what base year, initial levels and control schedules for consumption and production of

the controlled substance in Annex E will apply to Parties operating under paragraph 1 of this Article.

2. However, any Party operating under paragraph 1 of this Article shall exceed neither an annual calculated level of consumption of the controlled substances in Annex A of 0.3 kilograms per capita nor an annual calculated level of consumption of controlled substances of Annex B of 0.2 kilograms per capita.
3. When implementing the control measures set out in Articles 2A to 2E, any Party operating under paragraph 1 of this Article shall be entitled to use:
 - (a) For controlled substances under Annex A, either the average of its annual calculated level of consumption for the period 1995 to 1997 inclusive or a calculated level of consumption of 0.3 kilograms per capita, whichever is the lower, as the basis for determining its compliance with the control measures relating to consumption.
 - (b) For controlled substances under Annex B, the average of its annual calculated level of consumption for the period 1998 to 2000 inclusive or a calculated level of consumption of 0.2 kilograms per capita, whichever is the lower, as the basis for determining its compliance with the control measures relating to consumption.
 - (c) For controlled substances under Annex A, either the average of its annual calculated level of production for the period 1995 to 1997 inclusive or a calculated level of production of 0.3 kilograms per capita, whichever is the lower, as the basis for determining its compliance with the control measures relating to production.
 - (d) For controlled substances under Annex B, either the average of its annual calculated level of production for the period 1998 to 2000 inclusive or a calculated level of production of 0.2 kilograms per capita, whichever is the

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lower, as the basis for determining its compliance with the control measures relating to production.

4. If a Party operating under paragraph 1 of this Article, at any time before the control measures obligations in Articles 2A to 2I become applicable to it, finds itself unable to obtain an adequate supply of controlled substances, it may notify this to the Secretariat. The Secretariat shall forthwith transmit a copy of such notification to the Parties, which shall consider the matter at their next Meeting, and decide upon appropriate action to be taken.
5. Developing the capacity to fulfil the obligations of the Parties operating under paragraph 1 of this Article to comply with the control measures set out in Articles 2A to 2E and Article 2I, and any control measures in Articles 2F to 2H that are decided pursuant to paragraph 1 *bis* of this Article, and their implementation by those same Parties will depend upon the effective implementation of the financial co-operation as provided by Article 10 and the transfer of technology as provided by Article 10A.
6. Any Party operating under paragraph 1 of this Article may, at any time, notify the Secretariat in writing that, having taken all practicable steps it is unable to implement any or all of the obligations laid down in Articles 2A to 2E and Article 2I, or any or all obligations in Articles 2F to 2H that are decided pursuant to paragraph 1 *bis* of this Article, due to the inadequate implementation of Articles 10 and 10A. The Secretariat shall forthwith transmit a copy of the notification to the Parties, which shall consider the matter at their next Meeting, giving due recognition to paragraph 5 of this Article and shall decide upon appropriate action to be taken.
7. During the period between notification and the Meeting of the Parties at which the appropriate action referred to in paragraph 6 above is to be decided, or for a further period if the Meeting of the Parties so decides, the non-compliance procedures referred to in Article 8 shall not be invoked against the notifying Party.

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8. A Meeting of the Parties shall review, not later than 1995, the situation of the Parties operating under paragraph 1 of this Article, including the effective implementation of financial co-operation and transfer of technology to them, and adopt such revisions that may be deemed necessary regarding the schedule of control measures applicable to those Parties.
- 8 *bis*. Based on the conclusions of the review referred to in paragraph 8 above:
- (a) With respect to the controlled substances in Annex A, a Party operating under paragraph 1 of this Article shall, in order to meet its basic domestic needs, be entitled to delay for ten years its compliance with the control measures adopted by the Second Meeting of the Parties in London, 29 June 1990, and reference by the Protocol to Articles 2A and 2B shall be read accordingly;
 - (b) With respect to the controlled substances in Annex B, a Party operating under paragraph 1 of this Article shall, in order to meet its basic domestic needs, be entitled to delay for ten years its compliance with the control measures adopted by the Second Meeting of the Parties in London, 29 June 1990, and reference by the Protocol to Articles 2C to 2E shall be read accordingly.
- 8 *ter*. Pursuant to paragraph 1 *bis* above:
- (a) Each Party operating under paragraph 1 of this Article shall ensure that for the twelve-month period commencing on 1 January 2016, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed, annually, its calculated level of consumption in 2015. As of 1 January 2016 each Party operating under paragraph 1 of this Article shall comply with the control measures set out in paragraph 8 of Article 2F and, as the basis for its compliance with these control measures, it shall use the average of its calculated levels of production and consumption in 2015;

- (b) Each Party operating under paragraph 1 of this Article shall ensure that for the twelve-month period commencing on 1 January 2040, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Group I of Annex C does not exceed zero;
- (c) Each Party operating under paragraph 1 of this Article shall comply with Article 2G;
- (d) With regard to the controlled substance contained in Annex E:
 - (i) As of 1 January 2002 each Party operating under paragraph 1 of this Article shall comply with the control measures set out in paragraph 1 of Article 2H and, as the basis for its compliance with these control measures, it shall use the average of its annual calculated level of consumption and production, respectively, for the period of 1995 to 1998 inclusive;
 - (ii) Each Party operating under paragraph 1 of this Article shall ensure that for the twelve-month period commencing on 1 January 2005, and in each twelve-month period thereafter, its calculated levels of consumption and production of the controlled substance in Annex E do not exceed, annually, eighty per cent of the average of its annual calculated levels of consumption and production, respectively, for the period of 1995 to 1998 inclusive;
 - (iii) Each Party operating under paragraph 1 of this Article shall ensure that for the twelve-month period commencing on 1 January 2015 and in each twelve-month period thereafter, its calculated levels of consumption and production of the controlled substance in Annex E do not exceed zero. This paragraph will apply save to the extent that the

Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be critical uses;

- (iv) The calculated levels of consumption and production under this subparagraph shall not include the amounts used by the Party for quarantine and pre-shipment applications.

9. Decisions of the Parties referred to in paragraph 4, 6 and 7 of this Article shall be taken according to the same procedure applied to decision-making under Article 10.

Article 6: Assessment and review of control measures

Beginning in 1990, and at least every four years thereafter, the Parties shall assess the control measures provided for in Article 2 and Articles 2A to 2I on the basis of available scientific, environmental, technical and economic information. At least one year before each assessment, the Parties shall convene appropriate panels of experts qualified in the fields mentioned and determine the composition and terms of reference of any such panels. Within one year of being convened, the panels will report their conclusions, through the Secretariat, to the Parties.

Article 7: Reporting of data

1. Each Party shall provide to the Secretariat, within three months of becoming a Party, statistical data on its production, imports and exports of each of the controlled substances in Annex A for the year 1986, or the best possible estimates of such data where actual data are not available.
2. Each Party shall provide to the Secretariat statistical data on its production, imports and exports of each of the controlled substances

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- in Annex B and Annexes I and II of Group C for the year 1989;
- in Annex E, for the year 1991,

or the best possible estimates of such data where actual data are not available, not later than three months after the date when the provisions set out in the Protocol with regard to the substances in Annexes B, C and E respectively enter into force for that Party.

3. Each Party shall provide to the Secretariat statistical data on its annual production (as defined in paragraph 5 of Article 1) of each of the controlled substances listed in Annexes A, B, C and E and, separately, for each substance,

- Amounts used for feedstocks,
- Amounts destroyed by technologies approved by the Parties, and
- Imports from and exports to Parties and non-Parties respectively,

for the year during which provisions concerning the substances in Annexes A, B, C and E respectively entered into force for that Party and for each year thereafter. Each Party shall provide to the Secretariat statistical data on the annual amount of the controlled substance listed in Annex E used for quarantine and pre-shipment applications. Data shall be forwarded not later than nine months after the end of the year to which the data relate.

- 3 *bis*. Each Party shall provide to the Secretariat separate statistical data of its annual imports and exports of each of the controlled substances listed in Group II of Annex A and Group I of Annex C that have been recycled.

4. For Parties operating under the provisions of paragraph 8 (a) of Article 2, the requirements in paragraphs 1, 2, 3 and 3 *bis* of this Article in respect of statistical data on imports and

exports shall be satisfied if the regional economic integration organization concerned provides data on imports and exports between the organization and States that are not members of that organization.

Article 8: Non-compliance

The Parties, at their first meeting, shall consider and approve procedures and institutional mechanisms for determining non-compliance with the provisions of this Protocol and for treatment of Parties found to be in non-compliance.

Article 9: Research, development, public awareness and exchange of information

1. The Parties shall co-operate, consistent with their national laws, regulations and practices and taking into account in particular the needs of developing countries, in promoting, directly or through competent international bodies, research, development and exchange of information on:
 - (a) best technologies for improving the containment, recovery, recycling, or destruction of controlled substances or otherwise reducing their emissions;
 - (b) possible alternatives to controlled substances, to products containing such substances, and to products manufactured with them; and
 - (c) costs and benefits of relevant control strategies.
2. The Parties, individually, jointly or through competent international bodies, shall co-operate in promoting public awareness of the environmental effects of the emissions of controlled substances and other substances that deplete the ozone layer.

3. Within two years of the entry into force of this Protocol and every two years thereafter, each Party shall submit to the Secretariat a summary of the activities it has conducted pursuant to this Article.

Article 10: Financial mechanism

1. The Parties shall establish a mechanism for the purposes of providing financial and technical co-operation, including the transfer of technologies, to Parties operating under paragraph 1 of Article 5 of this Protocol to enable their compliance with the control measures set out in Articles 2A to 2E and Article 2I, and any control measures in Articles 2F to 2H that are decided pursuant to paragraph 1 *bis* of Article 5 of the Protocol. The mechanism, contributions to which shall be additional to other financial transfers to Parties operating under that paragraph, shall meet all agreed incremental costs of such Parties in order to enable their compliance with the control measures of the Protocol. An indicative list of the categories of incremental costs shall be decided by the meeting of the Parties.
2. The mechanism established under paragraph 1 shall include a Multilateral Fund. It may also include other means of multilateral, regional and bilateral co-operation.
3. The Multilateral Fund shall:
 - (a) Meet, on a grant or concessional basis as appropriate, and according to criteria to be decided upon by the Parties, the agreed incremental costs;
 - (b) Finance clearing-house functions to:
 - (i) Assist Parties operating under paragraph 1 of Article 5, through country specific studies and other technical co-operation, to identify their needs for co-operation;

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- (ii) Facilitate technical co-operation to meet these identified needs;
 - (iii) Distribute, as provided for in Article 9, information and relevant materials, and hold workshops, training sessions, and other related activities, for the benefit of Parties that are developing countries; and
 - (iv) Facilitate and monitor other multilateral, regional and bilateral co-operation available to Parties that are developing countries;
- (c) Finance the secretarial services of the Multilateral Fund and related support costs.
4. The Multilateral Fund shall operate under the authority of the Parties who shall decide on its overall policies.
5. The Parties shall establish an Executive Committee to develop and monitor the implementation of specific operational policies, guidelines and administrative arrangements, including the disbursement of resources, for the purpose of achieving the objectives of the Multilateral Fund. The Executive Committee shall discharge its tasks and responsibilities, specified in its terms of reference as agreed by the Parties, with the co-operation and assistance of the International Bank for Reconstruction and Development (World Bank), the United Nations Environment Programme, the United Nations Development Programme or other appropriate agencies depending on their respective areas of expertise. The members of the Executive Committee, which shall be selected on the basis of a balanced representation of the Parties operating under paragraph 1 of Article 5 and of the Parties not so operating, shall be endorsed by the Parties.
6. The Multilateral Fund shall be financed by contributions from Parties not operating under paragraph 1 of Article 5 in convertible currency or, in certain circumstances, in kind and/or in national currency, on the basis of the United Nations

scale of assessments. Contributions by other Parties shall be encouraged. Bilateral and, in particular cases agreed by a decision of the Parties, regional co-operation may, up to a percentage and consistent with any criteria to be specified by decision of the Parties, be considered as a contribution to the Multilateral Fund, provided that such co-operation, as a minimum:

- (a) Strictly relates to compliance with the provisions of this Protocol;
 - (b) Provides additional resources; and
 - (c) Meets agreed incremental costs.
7. The Parties shall decide upon the programme budget of the Multilateral Fund for each fiscal period and upon the percentage of contributions of the individual Parties thereto.
 8. Resources under the Multilateral Fund shall be disbursed with the concurrence of the beneficiary Party.
 9. Decisions by the Parties under this Article shall be taken by consensus whenever possible. If all efforts at consensus have been exhausted and no agreement reached, decisions shall be adopted by a two-thirds majority vote of the Parties present and voting, representing a majority of the Parties operating under paragraph 1 of Article 5 present and voting and a majority of the Parties not so operating present and voting.
 10. The financial mechanism set out in this Article is without prejudice to any future arrangements that may be developed with respect to other environmental issues.

Article 10A: Transfer of technology

Each Party shall take every practicable step, consistent with the programmes supported by the financial mechanism, to ensure:

- (a) that the best available, environmentally safe substitutes and related technologies are expeditiously transferred to Parties operating under paragraph 1 of Article 5; and
- (b) that the transfers referred to in subparagraph (a) occur under fair and most favourable conditions.

Article 11: Meetings of the parties

1. The Parties shall hold meetings at regular intervals. The Secretariat shall convene the first meeting of the Parties not later than one year after the date of the entry into force of this Protocol and in conjunction with a meeting of the Conference of the Parties to the Convention, if a meeting of the latter is scheduled within that period.
2. Subsequent ordinary meetings of the parties shall be held, unless the Parties otherwise decide, in conjunction with meetings of the Conference of the Parties to the Convention. Extraordinary meetings of the Parties shall be held at such other times as may be deemed necessary by a meeting of the Parties, or at the written request of any Party, provided that within six months of such a request being communicated to them by the Secretariat, it is supported by at least one third of the Parties.
3. The Parties, at their first meeting, shall:
 - (a) adopt by consensus rules of procedure for their meetings;
 - (b) adopt by consensus the financial rules referred to in paragraph 2 of Article 13;
 - (c) establish the panels and determine the terms of reference referred to in Article 6;
 - (d) consider and approve the procedures and institutional mechanisms specified in Article 8; and

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- (e) begin preparation of workplans pursuant to paragraph 3 of Article 10.
4. The functions of the meetings of the Parties shall be to:
- (a) review the implementation of this Protocol;
 - (b) decide on any adjustments or reductions referred to in paragraph 9 of Article 2;
 - (c) decide on any addition to, insertion in or removal from any annex of substances and on related control measures in accordance with paragraph 10 of Article 2;
 - (d) establish, where necessary, guidelines or procedures for reporting of information as provided for in Article 7 and paragraph 3 of Article 9;
 - (e) review requests for technical assistance submitted pursuant to paragraph 2 of Article 10;
 - (f) review reports prepared by the secretariat pursuant to subparagraph (c) of Article 12;
 - (g) assess, in accordance with Article 6, the control measures;
 - (h) consider and adopt, as required, proposals for amendment of this Protocol or any annex and for any new annex;
 - (i) consider and adopt the budget for implementing this Protocol; and
 - (j) consider and undertake any additional action that may be required for the achievement of the purposes of this Protocol.
5. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State not party to this Protocol, may be represented at meetings of the Parties as observers. Any body or agency, whether national or

international, governmental or non-governmental, qualified in fields relating to the protection of the ozone layer which has informed the secretariat of its wish to be represented at a meeting of the Parties as an observer may be admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Parties.

Article 12: Secretariat

For the purposes of this Protocol, the Secretariat shall:

- (a) arrange for and service meetings of the Parties as provided for in Article 11;
- (b) receive and make available, upon request by a Party, data provided pursuant to Article 7;
- (c) prepare and distribute regularly to the Parties reports based on information received pursuant to Articles 7 and 9;
- (d) notify the Parties of any request for technical assistance received pursuant to Article 10 so as to facilitate the provision of such assistance;
- (e) encourage non-Parties to attend the meetings of the Parties as observers and to act in accordance with the provisions of this Protocol;
- (f) provide, as appropriate, the information and requests referred to in subparagraphs (c) and (d) to such non-party observers; and
- (g) perform such other functions for the achievement of the purposes of this Protocol as may be assigned to it by the Parties.

Article 13: Financial provisions

1. The funds required for the operation of this Protocol, including those for the functioning of the Secretariat related to this Protocol, shall be charged exclusively against contributions from the Parties.
2. The Parties, at their first meeting, shall adopt by consensus financial rules for the operation of this Protocol.

Article 14: Relationship of this Protocol to the Convention

Except as otherwise provided in this Protocol, the provisions of the Convention relating to its protocols shall apply to this Protocol.

Article 15: Signature

This Protocol shall be open for signature by States and by regional economic integration organizations in Montreal on 16 September 1987, in Ottawa from 17 September 1987 to 16 January 1988, and at United Nations Headquarters in New York from 17 January 1988 to 15 September 1988.

Article 16: Entry into force

1. This Protocol shall enter into force on 1 January 1989, provided that at least eleven instruments of ratification, acceptance, approval of the Protocol or accession thereto have been deposited by States or regional economic integration organizations representing at least two-thirds of 1986 estimated global consumption of the controlled substances, and the provisions of paragraph 1 of Article 17 of the Convention have been fulfilled. In the event that these conditions have not been fulfilled by that date, the Protocol

shall enter into force on the ninetieth day following the date on which the conditions have been fulfilled.

2. For the purposes of paragraph 1, any such instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by member States of such organization.
3. After the entry into force of this Protocol, any State or regional economic integration organization shall become a Party to it on the ninetieth day following the date of deposit of its instrument of ratification, acceptance, approval or accession.

Article 17: Parties joining after entry into force

Subject to Article 5, any State or regional economic integration organization which becomes a Party to this Protocol after the date of its entry into force, shall fulfil forthwith the sum of the obligations under Article 2, as well as under Articles 2A to 2I and Article 4, that apply at that date to the States and regional economic integration organizations that became Parties on the date the Protocol entered into force.

Article 18: Reservations

No reservations may be made to this Protocol.

Article 19: Withdrawal

Any Party may withdraw from this Protocol by giving written notification to the Depositary at any time after four years of assuming the obligations specified in paragraph 1 of Article 2A. Any such withdrawal shall take effect upon expiry of one year after the date of

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its receipt by the Depositary, or on such later date as may be specified in the notification of the withdrawal.

Article 20: Authentic texts

The original of this Protocol, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

IN WITNESS WHEREOF THE UNDERSIGNED, BEING DULY AUTHORIZED TO THAT EFFECT, HAVE SIGNED THIS PROTOCOL.

DONE AT MONTREAL THIS SIXTEENTH DAY OF SEPTEMBER, ONE THOUSAND NINE HUNDRED AND EIGHTY SEVEN.

Annex A: Controlled substances

Group	Substance	Ozone-Depleting Potential*
<i>Group I</i>		
	CFC1 ₃	(CFC-11) 1.0
	CF ₂ Cl ₂	(CFC-12) 1.0
	C ₂ F ₃ Cl ₃	(CFC-113) 0.8
	C ₂ F ₄ Cl ₂	(CFC-114) 1.0
	C ₂ F ₅ Cl	(CFC-115) 0.6
<i>Group II</i>		
	CF ₂ BrCl	(halon-1211) 3.0
	CF ₃ Br	(halon-1301) 10.0
	C ₂ F ₄ Br ₂	(halon-2402) 6.0

* These ozone depleting potentials are estimates based on existing knowledge and will be reviewed and revised periodically.

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Annex B: Controlled substances

Group	Substance	Ozone-Depleting Potential
<i>Group I</i>		
	CF ₃ Cl (CFC-113)	1.0
	C ₂ FCl ₅ (CFC-111)	1.0
	C ₂ F ₂ Cl ₄ (CFC-112)	1.0
	C ₃ FCl ₇ (CFC-211)	1.0
	C ₃ F ₂ Cl ₆ (CFC-212)	1.0
	C ₃ F ₃ Cl ₅ (CFC-213)	1.0
	C ₃ F ₄ Cl ₄ (CFC-214)	1.0
	C ₃ F ₅ Cl ₃ (CFC-215)	1.0
	C ₃ F ₆ Cl ₂ (CFC-216)	1.0
	C ₃ F ₇ Cl (CFC-217)	1.0
<i>Group II</i>		
	CCl ₄ carbon tetrachloride	1.1
<i>Group III</i>		
	C ₂ H ₃ Cl ₃ * 1,1,1-trichloroethane* (methyl chloroform)	0.1

* This formula does not refer to 1,1,2-trichloroethane.

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Annex C: Controlled substances

Group	Substance	Number of isomers	Ozone-Depleting Potential	
<i>Group I</i>				
	CHFCI ₂	(HCFC-21)**	1	0.04
	CHF ₂ Cl	(HCFC-22)**	1	0.055
	CH ₂ FCI	(HCFC-31)	1	0.02
	C ₂ HFCl ₄	(HCFC-121)	2	0.01–0.04
	C ₂ HF ₂ Cl ₃	(HCFC-122)	3	0.02–0.08
	C ₂ HF ₃ Cl ₂	(HCFC-123)	3	0.02–0.06
	CHCl ₂ CF ₃	(HCFC-123)**	–	0.02
	C ₂ HF ₄ Cl	(HCFC-124)	2	0.02–0.04
	CHFCICF ₃	(HCFC-124)**	–	0.022
	C ₂ H ₂ FCI ₃	(HCFC-131)	3	0.007–0.05
	C ₂ H ₂ F ₂ Cl ₂	(HCFC-132)	4	0.008–0.05
	C ₂ H ₂ F ₃ Cl	(HCFC-133)	3	0.02–0.06
	C ₂ H ₃ FCI ₂	(HCFC-141)	3	0.005–0.07
	CH ₃ CFCl ₂	(HCFC-141b)**	–	0.11
	C ₂ H ₃ F ₂ Cl	(HCFC-142)	3	0.008–0.07
	CH ₃ CF ₂ Cl	(HCFC-142b)**	–	0.065
	C ₂ H ₄ FCI	(HCFC-151)	2	0.003–0.005
	C ₃ HFCl ₆	(HCFC-221)	5	0.015–0.07
	C ₃ HF ₂ Cl ₅	(HCFC-222)	9	0.01–0.09
	C ₃ HF ₃ Cl ₄	(HCFC-223)	12	0.01–0.08
	C ₃ HF ₄ Cl ₃	(HCFC-224)	12	0.01–0.09
	C ₃ HF ₅ Cl ₂	(HCFC-225)	9	0.02–0.07
	CF ₃ CF ₂ CHCl ₂	(HCFC-225ca)**	–	0.025
	CF ₂ CICF ₂ CHCIF	(HCFC-225cb)**	–	0.033
	C ₃ HF ₆ Cl	(HCFC-226)	5	0.02–0.10
	C ₃ H ₂ FCI ₅	(HCFC-231)	9	0.05–0.09
	C ₃ H ₂ F ₂ Cl ₄	(HCFC-232)	16	0.008–0.10
	C ₃ H ₂ F ₃ Cl ₃	(HCFC-233)	18	0.007–0.23
	C ₃ H ₂ F ₄ Cl ₂	(HCFC-234)	16	0.01–0.28
	C ₃ H ₂ F ₅ Cl	(HCFC-235)	9	0.03–0.52
	C ₃ H ₃ FCI ₄	(HCFC-241)	12	0.004–0.09
	C ₃ H ₃ F ₂ Cl ₃	(HCFC-242)	18	0.005–0.13
	C ₃ H ₃ F ₃ Cl ₂	(HCFC-243)	18	0.007–0.12
	C ₃ H ₃ F ₄ Cl	(HCFC-244)	12	0.009–0.14

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C ₃ H ₄ FCI ₃	(HCFC-251)	12	0.001–0.01
C ₃ H ₄ F ₂ Cl ₂	(HCFC-252)	16	0.005–0.04
C ₃ H ₄ F ₃ Cl	(HCFC-253)	12	0.003–0.03
C ₃ H ₅ FCI ₂	(HCFC-261)	9	0.002–0.02
C ₃ H ₅ F ₂ Cl	(HCFC-262)	9	0.002–0.02
C ₃ H ₆ FCI	(HCFC-271)	5	0.001–0.03
<i>Group II</i>			
CHFBr ₂		1	1.00
CHF ₂ Br	(HBFC-22B1)	1	0.74
CH ₂ FBr		1	0.73
C ₂ HFBr ₄		2	0.3–0.8
C ₂ HF ₂ Br ₃		3	0.5–1.8
C ₂ HF ₃ Br ₂		3	0.4–1.6
C ₂ HF ₄ Br		2	0.7–1.2
C ₂ H ₂ FBr ₃		3	0.1–1.1
C ₂ H ₂ F ₂ Br ₂		4	0.2–1.5
C ₂ H ₂ F ₃ Br		3	0.7–1.6
C ₂ H ₃ FBr ₂		3	0.1–1.7
C ₂ H ₃ F ₂ Br		3	0.2–1.1
C ₂ H ₄ FBr		2	0.07–0.1
C ₃ HFBr ₆		5	0.3–1.5
C ₃ HF ₂ Br ₅		9	0.2–1.9
C ₃ HF ₃ Br ₄		12	0.3–1.8
C ₃ HF ₄ Br ₃		12	0.5–2.2
C ₃ HF ₅ Br ₂		9	0.9–2.0
C ₃ HF ₆ Br		5	0.7–3.3
C ₃ H ₂ FBr ₅		9	0.1–1.9
C ₃ H ₂ F ₂ Br ₄		16	0.2–2.1
C ₃ H ₂ F ₃ Br ₃		18	0.2–5.6
C ₃ H ₂ F ₄ Br ₂		16	0.3–7.5
C ₃ H ₂ F ₅ Br		8	0.9–14.0
C ₃ H ₃ FBr ₄		12	0.08–1.9
C ₃ H ₃ F ₂ Br ₃		18	0.1–3.1
C ₃ H ₃ F ₃ Br ₂		18	0.1–2.5
C ₃ H ₃ F ₄ Br		12	0.3–4.4
C ₃ H ₄ FBr ₃		12	0.03–0.3
C ₃ H ₄ F ₂ Br ₂		16	0.1–1.0

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C ₃ H ₄ F ₃ Br		12	0.07–0.8
C ₃ H ₅ FBr ₂		9	0.04–0.4
C ₃ H ₅ F ₂ Br		9	0.07–0.8
C ₃ H ₆ FBr		5	0.02–0.7
<i>Group III</i>			
CH ₂ BrCl	bromochloromethane	1	0.12

- * Where a range of ODPs is indicated, the highest value in that range shall be used for the purposes of the Protocol. The ODPs listed as a single value have been determined from calculations based on laboratory measurements. Those listed as a range are based on estimates and are less certain. The range pertains to an isomeric group. The upper value is the estimate of the ODP of the isomer with the highest ODP, and the lower value is the estimate of the ODP of the isomer with the lowest ODP.
- ** Identifies the most commercially viable substances with ODP values listed against them to be used for the purposes of the Protocol.

Annex D:* A list of products
containing controlled
substances specified in
Annex A**

Products	Customs code number
1. Automobile and truck air conditioning units (whether incorporated in vehicles or not)
2. Domestic and commercial refrigeration and air conditioning/heat pump equipment***
e.g. Refrigerators
Freezers
Dehumidifiers
Water coolers
Ice machines
Air conditioning and heat pump units
3. Aerosol products, except medical aerosols
4. Portable fire extinguisher
5. Insulation boards, panels and pipe covers
6. Pre-polymers

* This Annex was adopted by the Third Meeting of the Parties in Nairobi, 21 June 1991 as required by paragraph 3 of Article 4 of the Protocol.

** Though not when transported in consignments of personal or household effects or in similar non-commercial situations normally exempted from customs attention.

*** When containing controlled substances in Annex A as a refrigerant and/or in insulating material of the product.

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Annex E: Controlled substance

<u>Group</u>	<u>Substance</u>	<u>Ozone-Depleting Potential</u>
<i>Group I</i>		
CH ₃ Br	methyl bromide	0.6

This text contains the latest version of the Montreal Protocol on Substances that Deplete the Ozone Layer, updated to March 2000 to include the cumulative amendments to various articles adopted by Parties at their Second, Fourth, Ninth and Eleventh Meetings. It includes also the adjustments in levels of production and consumption of the controlled substances listed in annexes A, B, C and E to the Protocol, as decided by the Parties on the basis of assessment made in pursuance of article 6 of the Protocol at the Second, Fourth, Seventh, Ninth and Eleventh Meetings. It should be noted that while amendments to the Protocol enter into force automatically six months after the date of official notification by the Depositary, each set of amendments is subject to ratification and enters into force and becomes binding for Parties to such amendments only after it has been ratified by a minimum number of Parties.

The texts of the adjustments and amendments to the Protocol as agreed by the Parties to the Protocol at meetings in London, Copenhagen, Vienna, Montreal and Beijing are available from either the Depositary, the United Nations Secretary-General, the Ozone Secretariat in UNEP or the Treaties Sections of the Ministries of Foreign Affairs of various Governments.

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**DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE
COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous
substances in electrical and electronic equipment**

DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 27 January 2003

on the restriction of the use of certain hazardous substances in electrical and electronic equipment

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION.

Having regard to the Treaty establishing the European Community, and in particular Article 95 thereof,

Having regard to the proposal from the Commission ⁽¹⁾,

Having regard to the opinion of the Economic and Social Committee ⁽²⁾,

Having regard to the opinion of the Committee of Regions ⁽³⁾,

Acting in accordance with the procedure laid down in Article 251 of the Treaty in the light of the joint text approved by the Conciliation Committee on 8 November 2002 ⁽⁴⁾,

Whereas:

- (1) The disparities between the laws or administrative measures adopted by the Member States as regards the restriction of the use of hazardous substances in electrical and electronic equipment could create barriers to trade and distort competition in the Community and may thereby have a direct impact on the establishment and functioning of the internal market. It therefore appears necessary to approximate the laws of the Member States in this field and to contribute to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment.
- (2) The European Council at its meeting in Nice on 7, 8 and 9 December 2000 endorsed the Council Resolution of 4 December 2000 on the precautionary principle.
- (3) The Commission Communication of 30 July 1996 on the review of the Community strategy for waste management stresses the need to reduce the content of hazardous substances in waste and points out the potential benefits of Community-wide rules limiting the presence of such substances in products and in production processes.
- (4) The Council Resolution of 25 January 1988 on a Community action programme to combat environmental pollution by cadmium ⁽⁵⁾ invites the Commission to pursue without delay the development of specific measures for such a programme. Human health also has

to be protected and an overall strategy that in particular restricts the use of cadmium and stimulates research into substitutes should therefore be implemented. The Resolution stresses that the use of cadmium should be limited to cases where suitable and safer alternatives do not exist.

- (5) The available evidence indicates that measures on the collection, treatment, recycling and disposal of waste electrical and electronic equipment (WEEE) as set out in Directive 2002/96/EC of 27 January 2003 of the European Parliament and of the Council on waste electrical and electronic equipment ⁽⁶⁾ are necessary to reduce the waste management problems linked to the heavy metals concerned and the flame retardants concerned. In spite of those measures, however, significant parts of WEEE will continue to be found in the current disposal routes. Even if WEEE were collected separately and submitted to recycling processes, its content of mercury, cadmium, lead, chromium VI, PBB and PBDE would be likely to pose risks to health or the environment.
- (6) Taking into account technical and economic feasibility, the most effective way of ensuring the significant reduction of risks to health and the environment relating to those substances which can achieve the chosen level of protection in the Community is the substitution of those substances in electrical and electronic equipment by safe or safer materials. Restricting the use of these hazardous substances is likely to enhance the possibilities and economic profitability of recycling of WEEE and decrease the negative health impact on workers in recycling plants.
- (7) The substances covered by this Directive are scientifically well researched and evaluated and have been subject to different measures both at Community and at national level.
- (8) The measures provided for in this Directive take into account existing international guidelines and recommendations and are based on an assessment of available scientific and technical information. The measures are necessary to achieve the chosen level of protection of

⁽¹⁾ OJ C 365 E, 19.12.2000, p. 195 and OJ C 240 E, 28.8.2001, p. 303.

⁽²⁾ OJ C 116, 20.4.2001, p. 38.

⁽³⁾ OJ C 148, 18.5.2001, p. 1.

⁽⁴⁾ Opinion of the European Parliament of 15 May 2001 (OJ C 34 E, 7.2.2002, p. 109), Council Common Position of 4 December 2001 (OJ C 90 E, 16.4.2002, p. 12) and Decision of the European Parliament of 10 April 2002 (not yet published in the Official Journal), Decision of the European Parliament of 18 December 2002 and Decision of the Council of 16 December 2002.

⁽⁵⁾ OJ C 30, 4.2.1988, p. 1.

⁽⁶⁾ See page 24 of this Official Journal.

human and animal health and the environment, having regard to the risks which the absence of measures would be likely to create in the Community. The measures should be kept under review and, if necessary, adjusted to take account of available technical and scientific information.

- (9) This Directive should apply without prejudice to Community legislation on safety and health requirements and specific Community waste management legislation, in particular Council Directive 91/157/EEC of 18 March 1991 on batteries and accumulators containing certain dangerous substances⁽¹⁾.
- (10) The technical development of electrical and electronic equipment without heavy metals, PBDE and PBB should be taken into account. As soon as scientific evidence is available and taking into account the precautionary principle, the prohibition of other hazardous substances and their substitution by more environmentally friendly alternatives which ensure at least the same level of protection of consumers should be examined.
- (11) Exemptions from the substitution requirement should be permitted if substitution is not possible from the scientific and technical point of view or if the negative environmental or health impacts caused by substitution are likely to outweigh the human and environmental benefits of the substitution. Substitution of the hazardous substances in electrical and electronic equipment should also be carried out in a way so as to be compatible with the health and safety of users of electrical and electronic equipment (EEE).
- (12) As product reuse, refurbishment and extension of lifetime are beneficial, spare parts need to be available.
- (13) The adaptation to scientific and technical progress of the exemptions from the requirements concerning phasing out and prohibition of hazardous substances should be effected by the Commission under a committee procedure.
- (14) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission⁽²⁾.

HAVE ADOPTED THIS DIRECTIVE:

Article 1

Objectives

The purpose of this Directive is to approximate the laws of the Member States on the restrictions of the use of hazardous substances in electrical and electronic equipment and to contribute

to the protection of human health and the environmentally sound recovery and disposal of waste electrical and electronic equipment.

Article 2

Scope

- Without prejudice to Article 6, this Directive shall apply to electrical and electronic equipment falling under the categories 1, 2, 3, 4, 5, 6, 7 and 10 set out in Annex IA to Directive No 2002/96/EC (WEEE) and to electric light bulbs, and luminaires in households.
- This Directive shall apply without prejudice to Community legislation on safety and health requirements and specific Community waste management legislation.
- This Directive does not apply to spare parts for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 July 2006.

Article 3

Definitions

For the purposes of this Directive, the following definitions shall apply:

- 'electrical and electronic equipment' or 'EEE' means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in Annex IA to Directive 2002/96/EC (WEEE) and designed for use with a voltage rating not exceeding 1 000 volts for alternating current and 1 500 volts for direct current;
- 'producer' means any person who, irrespective of the selling technique used, including by means of distance communication according to Directive 97/7/EC of the European Parliament and of the Council of 20 May 1997 on the protection of consumers in respect of distance contracts⁽³⁾:
 - manufactures and sells electrical and electronic equipment under his own brand;
 - resells under his own brand equipment produced by other suppliers, a reseller not being regarded as the 'producer' if the brand of the producer appears on the equipment, as provided for in subpoint (i); or
 - imports or exports electrical and electronic equipment on a professional basis into a Member State.

Whoever exclusively provides financing under or pursuant to any finance agreement shall not be deemed a 'producer' unless he also acts as a producer within the meaning of subpoints (i) to (iii).

⁽¹⁾ OJ L 78, 26.3.1991, p. 38. Directive as amended by Commission Directive 93/101/EC (OJ L 1, 5.1.1999, p. 1).

⁽²⁾ OJ L 184, 17.7.1999, p. 25.

⁽³⁾ OJ L 144, 4.6.1997, p. 19. Directive as amended by Directive 2002/65/EC (L 271, 9.10.2002, p. 16).

Article 4

Prevention

1. Member States shall ensure that, from 1 July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE). National measures restricting or prohibiting the use of these substances in electrical and electronic equipment which were adopted in line with Community legislation before the adoption of this Directive may be maintained until 1 July 2006.

2. Paragraph 1 shall not apply to the applications listed in the Annex.

3. On the basis of a proposal from the Commission, the European Parliament and the Council shall decide, as soon as scientific evidence is available, and in accordance with the principles on chemicals policy as laid down in the Sixth Community Environment Action Programme, on the prohibition of other hazardous substances and the substitution thereof by more environment-friendly alternatives which ensure at least the same level of protection for consumers.

Article 5

Adaptation to scientific and technical progress

1. Any amendments which are necessary in order to adapt the Annex to scientific and technical progress for the following purposes shall be adopted in accordance with the procedure referred to in Article 7(2):

- (a) establishing, as necessary, maximum concentration values up to which the presence of the substances referred to in Article 4(1) in specific materials and components of electrical and electronic equipment shall be tolerated;
- (b) exempting materials and components of electrical and electronic equipment from Article 4(1) if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to therein is technically or scientifically impracticable, or where the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits thereof;
- (c) carrying out a review of each exemption in the Annex at least every four years or four years after an item is added to the list with the aim of considering deletion of materials and components of electrical and electronic equipment from the Annex if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to in

Article 4(1) is technically or scientifically possible, provided that the negative environmental, health and/or consumer safety impacts caused by substitution do not outweigh the possible environmental, health and/or consumer safety benefits thereof.

2. Before the Annex is amended pursuant to paragraph 1, the Commission shall *inter alia* consult producers of electrical and electronic equipment, recyclers, treatment operators, environmental organisations and employee and consumer associations. Comments shall be forwarded to the Committee referred to in Article 7(1). The Commission shall provide an account of the information it receives.

Article 6

Review

Before 13 February 2005, the Commission shall review the measures provided for in this Directive to take into account, as necessary, new scientific evidence.

In particular the Commission shall, by that date, present proposals for including in the scope of this Directive equipment which falls under categories 8 and 9 set out in Annex IA to Directive 2002/96/EC (WEEE).

The Commission shall also study the need to adapt the list of substances of Article 4(1), on the basis of scientific facts and taking the precautionary principle into account, and present proposals to the European Parliament and Council for such adaptations, if appropriate.

Particular attention shall be paid during the review to the impact on the environment and on human health of other hazardous substances and materials used in electrical and electronic equipment. The Commission shall examine the feasibility of replacing such substances and materials and shall present proposals to the European Parliament and to the Council in order to extend the scope of Article 4, as appropriate.

Article 7

Committee

1. The Commission shall be assisted by the Committee set up by Article 18 of Council Directive 75/442/EEC⁽¹⁾.

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to Article 8 thereof.

The period provided for in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

(1) OJ L 194, 25.7.1975, p. 39.

*Article 8***Penalties**

Member States shall determine penalties applicable to breaches of the national provisions adopted pursuant to this Directive. The penalties thus provided for shall be effective, proportionate and dissuasive.

*Article 9***Transposition**

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive before 15 August 2004. They shall immediately inform the Commission thereof.

When Member States adopt those measures, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. The methods of making such a reference shall be laid down by the Member States.

2. Member States shall communicate to the Commission the text of all laws, regulations and administrative provisions adopted in the field covered by this Directive.

*Article 10***Entry into force**

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Union*.

*Article 11***Addressees**

This Directive is addressed to the Member States.

Done at Brussels, 27 January 2003.

For the European Parliament

The President

P. COX

For the Council

The President

G. DRYS

ANNEX

Applications of lead, mercury, cadmium and hexavalent chromium, which are exempted from the requirements of Article 4(1)

1. Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
2. Mercury in straight fluorescent lamps for general purposes not exceeding:

— halophosphate	10 mg
— triphosphate with normal lifetime	5 mg
— triphosphate with long lifetime	8 mg.
3. Mercury in straight fluorescent lamps for special purposes.
4. Mercury in other lamps not specifically mentioned in this Annex.
5. Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
6. Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminium containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
7. — Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85 % lead),
 - lead in solders for servers, storage and storage array systems (exemption granted until 2010),
 - lead in solders for network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunication,
 - lead in electronic ceramic parts (e.g. piezoelectric devices).
8. Cadmium plating except for applications banned under Directive 91/338/EEC (3) amending Directive 76/769/EEC (4) relating to restrictions on the marketing and use of certain dangerous substances and preparations.
9. Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators.
10. Within the procedure referred to in Article 7(2), the Commission shall evaluate the applications for:
 - Deca BDE,
 - mercury in straight fluorescent lamps for special purposes,
 - lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications (with a view to setting a specific time limit for this exemption), and
 - light bulbs,
 as a matter of priority in order to establish as soon as possible whether these items are to be amended accordingly.

(3) OJ L 186, 12.7.1991, p. 59.

(4) OJ L 262, 27.9.1976, p. 201.

COMMISSION DECISION

of 18 August 2005

amending Directive 2002/95/EC of the European Parliament and of the Council for the purpose of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment

(notified under document number C(2005) 3143)

(2005/618/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES.

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment⁽¹⁾, and in particular Article 5(1)(a) thereof,

Whereas:

- (1) Since it is evident that a total avoidance of heavy metals and brominated flame retardants is in some instances impossible to achieve, certain concentration values for lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) in materials should be tolerated.
- (2) The proposed maximum concentration values are based on existing Community chemicals legislation and are considered the most appropriate to ensure a high level of protection.
- (3) Pursuant to Article 5(2) the Commission has consulted producers of electric and electronic equipment, recyclers, treatment operators, environmental organisations and employee and consumer associations and forwarded the comments to the Committee established by Article 18 of Council Directive 75/442/EEC of 15 July 1975 on waste⁽²⁾.
- (4) The Commission submitted the measures provided for in this Decision for vote in the Committee established under Article 18 of Directive 75/442/EEC on waste on 10 June 2004. There was no qualified majority in favour of these measures. Thus, in accordance with the procedure set out in Article 18 of Directive 75/442/EEC, a proposal for a

Council Decision was submitted to Council on 23 September 2004. Since on the expiry date of the period laid down in Article 7(2) of Directive 2002/95/EC the Council had neither adopted the proposed measures nor indicated its opposition to them in accordance with Article 5(6) of Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission⁽³⁾ the measures should be adopted by the Commission.

HAS ADOPTED THIS DECISION:

Article 1

In the Annex to Directive 2002/95/EC the following note is added:

'For the purposes of Article 5(1)(a), a maximum concentration value of 0,1 % by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0,01 % by weight in homogeneous materials for cadmium shall be tolerated.'

Article 2

This Decision shall apply from 1 July 2006.

Article 3

This Decision is addressed to the Member States.

Done at Brussels, 18 August 2005.

For the Commission
Stavros DIMAS
Member of the Commission

⁽¹⁾ OJ L 37, 13.2.2003, p. 19.

⁽²⁾ OJ L 194, 25.7.1975, p. 39. Directive as last amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

⁽³⁾ OJ L 184, 17.7.1999, p. 23.

COMMISSION DECISION

of 13 October 2005

amending for the purposes of adapting to the technical progress the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment

(notified under document number C(2005) 3754)

(Text with EEA relevance)

(2005/717/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES.

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment⁽¹⁾, and in particular Article 5(1)(b) thereof.

Whereas:

(1) Under Directive 2002/95/EC the Commission is required to evaluate certain hazardous substances prohibited pursuant to Article 4(1) of that Directive.

(2) Certain materials and components containing lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) should be exempt from the prohibition, since the elimination or substitution of these hazardous substances in those specific materials and components is still impracticable.

(3) Since the risk assessment of DecaBDE, under Council Regulation (EEC) No 793/93 of 23 March 1993 on the evaluation and control of the risks of existing substances⁽²⁾, has concluded that there is at present no need for measures to reduce the risks for consumers beyond those which are being applied already, but additional studies are required under the risk assessment, DecaBDE can be exempted until further notice from the requirements of Article 4(1) of Directive 2002/95/EC. Should new evidence lead to a different conclusion of the risk assessment, this decision would be re-examined and amended, if appropriate. In parallel industry is implementing a voluntary emissions reduction programme.

(4) Exemptions from the prohibition for certain specific materials or components should be limited in their scope, in order to achieve a gradual phase-out of hazardous substances in electrical and electronic equipment, given that the use of those substances in such applications will become avoidable.

(5) Pursuant to Article 5(1)(c) of Directive 2002/95/EC, each exemption listed in the Annex to that Directive must be subject to a review at least every four years or four years after an item is added to the list with the aim of considering deletion of materials and components of electrical and electronic equipment if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to in Article 4(1) is technically or scientifically possible, provided that the negative environmental, health and/or consumer safety impacts caused by substitution do not outweigh the possible environmental, health and/or consumer safety benefits thereof. Therefore, the review of each exemption provided for in this Decision will be done before 2010.

(6) Pursuant to Article 5(2) of Directive 2002/95/EC, the Commission has consulted producers of electrical and electronic equipment, recyclers, treatment operators, environmental organisations and employee and consumers associations and forwarded the comments to the Committee established by Article 18 of Council Directive 75/442/EEC of 15 July 1975 on waste⁽³⁾ (the Committee).

(7) The Commission submitted the measures provided for in this Decision for vote in the Committee established under Article 18 of Directive 75/442/EEC on waste on 19 April 2005. There was no qualified majority in favour of these measures. Thus, in accordance with the procedure set out in Article 18 of Directive 75/442/EEC, a Proposal for a Council Decision was submitted to Council on 6 June 2005. Since on the expiry date of the period laid down in Article 7(2) of Directive 2002/95/EC the Council had neither adopted the proposed measures nor indicated its opposition to them in accordance with Article 5(6) of Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission⁽⁴⁾ the measures should be adopted by the Commission.

⁽¹⁾ OJ L 37, 13.2.2003, p. 19.

⁽²⁾ OJ L 84, 5.4.1993, p. 1. Regulation as amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

⁽³⁾ OJ L 194, 25.7.1975, p. 39. Directive as last amended by Regulation (EC) No 1882/2003.

⁽⁴⁾ OJ L 184, 17.7.1999, p. 23.

HAS ADOPTED THIS DECISION:

Sole Article

The Annex to Directive 2002/95/EC is amended as set out in the Annex to this Decision.

This Decision is addressed to the Member States.

Done at Brussels, 13 October 2005.

For the Commission
Stavros DIMAS
Member of the Commission

ANNEX

The Annex to Directive 2002/95/EC is amended as follows:

1. The title is replaced by the following:

'Applications of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) which are exempted from the requirements of Article 4(1);

2. The following point 9a is added:

'9a. DecaBDE in polymeric applications;

3. The following point 9b is added:

'9b. Lead in lead-bronze bearing shells and bushes.'

COMMISSION DECISION

of 21 October 2005

amending for the purposes of adapting to technical progress the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment

(notified under document number C(2005) 4054)

(Text with EEA relevance)

(2005/747/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment ⁽¹⁾, and in particular Article 5(1)(b) thereof.

Whereas:

- (1) In accordance with Directive 2002/95/EC the Commission is required to evaluate certain hazardous substances prohibited pursuant to Article 4(1) of that Directive.
- (2) Certain materials and components containing lead and cadmium should be exempt (or continue to be exempt) from the prohibition, since the use of these hazardous substances in those specific materials and components is still unavoidable.
- (3) Some exemptions from the prohibition for certain specific materials or components should be limited in their scope, in order to achieve a gradual phase-out of hazardous substances in electrical and electronic equipment, given that the use of those substances in such applications will become avoidable.
- (4) Pursuant to Article 5(1)(c) of Directive 2002/95/EC each exemption listed in the Annex must be subjected to a review, at least every four years or four years after an item is added to the list, with the aim of considering deletion of materials and components of electrical and electronic equipment if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to in Article 4(1) are technically or scientifically possible.

provided that the negative environmental, health and/or consumer safety impacts caused by substitution do not outweigh the possible environmental, health and/or consumer safety benefits thereof.

- (5) Directive 2002/95/EC should therefore be amended accordingly.
- (6) Pursuant to Article 5(2) of Directive 2002/95/EC the Commission has consulted producers of electrical and electronic equipment, recyclers, treatment operators, environmental organisations and employee and consumers associations and forwarded the comments to the Committee established by Article 18 of Council Directive 75/442/EEC of 15 July 1975 on waste ⁽²⁾, hereinafter 'the Committee'.
- (7) The measures provided for in this Decision are in accordance with the opinion of the Committee.

HAS ADOPTED THIS DECISION:

Article 1

The Annex to Directive 2002/95/EC is amended as set out in the Annex to this Decision.

Article 2

This Decision is addressed to the Member States.

Done at Brussels, 21 October 2005.

For the Commission

Stavros DIMAS

Member of the Commission

⁽¹⁾ OJ L 37 13.2.2003, p. 19. Directive as amended by Commission Decision 2005/717/EC (OJ L 271, 15.10.2005, p. 48).

⁽²⁾ OJ L 194, 25.7.1975, p. 39. Directive as last amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

ANNEX

Annex to Directive 2002/95/EC is amended as follows:

1. point 7 is replaced by the following:

- 7. — Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
 - lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications.
 - lead in electronic ceramic parts (e.g. piezoelectric devices).;

2. point 8 is replaced by the following:

- 8. Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC (*) amending Directive 76/769/EEC (**) relating to restrictions on the marketing and use of certain dangerous substances and preparations.

(*) OJ L 186, 12.7.1991, p. 59.

(**) OJ L 262, 27.9.1976, p. 201.;

3. the following points are added:

- 11. Lead used in compliant pin connector systems.
 - 12. Lead as a coating material for the thermal conduction module c-ring.
 - 13. Lead and cadmium in optical and filter glass.
 - 14. Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight.
 - 15. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages.
-

COMMISSION

COMMISSION DECISION

of 21 April 2006

amending, for the purposes of adapting to the technical progress, the Annex to Directive 2002/95/EC of the European Parliament and of the Council as regards exemptions for applications of lead

(notified under document number C(2006) 1622)

(Text with EEA relevance)

(2006/310/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

equipment, given that the use of those substances in such applications will become avoidable.

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment⁽¹⁾, and in particular Article 5(1)(b) thereof.

Whereas:

- (1) Under Directive 2002/95/EC the Commission is required to evaluate certain hazardous substances prohibited pursuant to Article 4(1) of that Directive.
- (2) Certain materials and components containing lead should be exempted from the prohibition, since the use of these hazardous substances in those specific materials and components is still unavoidable.
- (3) Certain materials and components containing lead should be exempted from the prohibition, since the negative environmental, health and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health and/or consumer safety benefits thereof.
- (4) Some exemptions from the prohibition for certain specific materials or components should be limited in their scope, in order to achieve a gradual phase-out of hazardous substances in electrical and electronic

- (5) Pursuant to Article 5(1)(c) of Directive 2002/95/EC each exemption listed in the Annex must be subject to a review at least every four years or four years after an item is added to the list with the aim of considering deletion of materials and components of electrical and electronic equipment if their elimination or substitution via design changes or materials and components which do not require any of the materials or substances referred to in Article 4(1) of that Directive is technically or scientifically possible, provided that the negative environmental, health and/or consumer safety impacts caused by substitution do not outweigh the possible environmental, health and/or consumer safety benefits thereof.

- (6) Directive 2002/95/EC should therefore be amended accordingly.

- (7) Pursuant to Article 5(2) of Directive 2002/95/EC the Commission has consulted producers of electrical and electronic equipment, recyclers, treatment operators, environmental organisations and employee and consumers associations.

- (8) The measures provided for in this Decision are in accordance with the opinion of the Committee established by Article 18 of Council Directive 75/442/EEC⁽²⁾.

HAS ADOPTED THIS DECISION:

Article 1

The Annex to Directive 2002/95/EC is amended as set out in the Annex to this Decision.

⁽¹⁾ OJ L 37, 13.2.2003, p. 19. Directive as last amended by Commission Decision 2005/747/EC (OJ L 280, 25.10.2005, p. 18).

⁽²⁾ OJ L 194, 25.7.1975, p. 39. Directive as last amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

Article 2

This Decision is addressed to the Member States.

Done at Brussels, 21 April 2006.

For the Commission
Stavros DIMAS
Member of the Commission

ANNEX

In the Annex to Directive 2002/95/EC the following points 16 to 20 are added:

16. Lead in linear incandescent lamps with silicate coated tubes.
17. Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications.
18. Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($\text{BaSi}_2\text{O}_7:\text{Pb}$) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ($(\text{Sr},\text{Ba})_2\text{MgSi}_2\text{O}_7:\text{Pb}$).
19. Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL).
20. Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD).

ภาคผนวก ง

**The Restriction of the Use of Certain Hazardous Substances in Electrical and
Electronic Equipment Regulations 2008**

 STATUTORY INSTRUMENTS

2008 No. 37

ENVIRONMENTAL PROTECTION
**The Restriction of the Use of Certain Hazardous Substances in
Electrical and Electronic Equipment Regulations 2008**

<i>Made</i> - - - -	<i>10th January 2008</i>
<i>Laid before Parliament</i>	<i>11th January 2008</i>
<i>Coming into force</i> - -	<i>1st February 2008</i>

The Secretary of State is a Minister designated(a) for the purposes of section 2(2) of the European Communities Act 1972(b) (“section 2(2)”) in respect of measures relating to the restriction of the use of hazardous substances in electrical and electronic equipment.

These Regulations make provision for a purpose mentioned in section 2(2) and it appears to the Secretary of State that it is expedient for the reference in regulation 5 to the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment(c) to be construed as a reference to that Annex as amended from time to time.

The Secretary of State, in exercise of the powers conferred on him by section 2(2), makes the following Regulations.

PART 1**Preliminary****Citation and commencement**

1. These Regulations may be cited as the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008 and shall come into force on 1st February 2008.

Revocation

2. The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2006(d) (“the 2006 Regulations”) are revoked.

(a) S.I. 2003/2901 and S.I. 2004/706.

(b) 1972 c.68, as amended by numerous subsequent Acts; however, the only amendments relevant for the purposes of these Regulations are those introduced by Part 3 of the Legislative and Regulatory Reform Act 2006 (c.51).

(c) O.J.L. 37, 13.2.2003, p. 19.

(d) S.I. 2006/1463.

Interpretation

3. In these Regulations—

“compliance notice” has the meaning given in regulation 14(2);

“electrical and electronic equipment” means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in Annex 1A to Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment(a) and designed for use with a voltage rating not exceeding 1,000 volts for alternating current and 1,500 volts for direct current;

“enforcement notice” has the meaning given in regulation 15(2);

“enforcement officer” means a person appointed to act on behalf of the Secretary of State for the purposes of enforcing these Regulations;

“infringing goods” has the meaning given in regulation 15(2)(a);

“producer” means any person who, irrespective of the selling technique used, including by means of distance communication according to Directive 97/7/EC(b) as amended by Directive 2002/65/EC(c) on the protection of consumers in respect of distance contracts—

- (a) manufactures and sells electrical and electronic equipment under that person’s own brand;
- (b) resells under that person’s own brand equipment produced by other suppliers, but for these purposes a reseller shall not be regarded as the producer if the brand of the producer appears on the equipment, as provided for in (a); or
- (c) imports or exports electrical and electronic equipment on a professional basis into an EEA state; and

“the 2006 Regulations” has the meaning given in regulation 2.

Electrical and electronic equipment to which these Regulations apply

4. These Regulations apply to electrical and electronic equipment that is within the categories set out in the Schedule and to electric light bulbs and to luminaires for use in households.

Electrical and electronic equipment to which these Regulations do not apply

5. These Regulations do not apply to those applications of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers which are listed in the Annex to Directive 2002/95/EC of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment(d), as that Annex is amended from time to time.

Existing legislation

6. Nothing in these Regulations shall affect the application of existing Community legislation and national legislation as regards—

- (a) safety and health requirements; and
- (b) waste management.

(a) OJ L 37, 13.2.2003, p. 24.

(b) OJ L 144, 4.6.1997, p. 19.

(c) OJ L 271, 9.10.2002, p. 16.

(d) The Annex to this Directive (OJ L 37, 13.2.2003, p. 23) has been amended on a number of occasions and is expected to continue to be amended from time to time. The amendments to the Directive in force as at the making of these Regulations are to be found at OJ L 214, 19.8.2005, p. 65 (Commission Decision 2005/618/EC); OJ L 271, 15.10.2005, p. 48 (Commission Decision 2005/717/EC); OJ L 280, 25.10.2005, p. 18 (Commission Decision 2005/747/EC); OJ L 115, 28.4.2006, p. 38 (Commission Decision 2006/310/EC); OJ L 283, 14.10.2006, p. 47 (Commission Decision 2006/690/EC); OJ L 283, 14.10.2006, p. 48 (Commission Decision 2006/691/EC); and OJ L 283, 14.10.2006, p. 50 (Commission Decision 2006/692/EC).

PART 2

Producers' obligations

Prohibition on hazardous substances

7. Producers shall ensure that new electrical and electronic equipment put on the market on or after 1st February 2008 does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers in quantities exceeding the following maximum concentration value levels—

- (a) 0.1% by weight in homogeneous materials for lead;
- (b) 0.1% by weight in homogeneous materials for mercury;
- (c) 0.1% by weight in homogeneous materials for hexavalent chromium;
- (d) 0.1% by weight in homogeneous materials for polybrominated biphenyls;
- (e) 0.1% by weight in homogeneous materials for polybrominated diphenyl ethers; and
- (f) 0.01% by weight in homogeneous materials for cadmium.

Technical documentation

8. Producers shall—

- (a) prepare technical documentation or other information showing that any electrical and electronic equipment which they have put on the market complies with the requirements of regulation 7;
- (b) retain that technical documentation or other information for a period of four years from the date on which they put the equipment on the market; and
- (c) if the Secretary of State so requests by notice in writing, submit that technical documentation or other information (or copies of it) to the Secretary of State within 28 days of the date of the notice.

PART 3

Enforcement

Enforcement authority

9.—(1) It shall be the duty of the Secretary of State to enforce these Regulations.

(2) The Secretary of State may appoint any person to act on behalf of the Secretary of State for the purposes of paragraph (1).

(3) The Secretary of State shall not commence proceedings for an offence in Scotland.

Test purchases

10.—(1) The Secretary of State may purchase electrical and electronic equipment for the purpose of ascertaining whether the requirements of regulation 7 have been met in respect of it.

(2) If—

- (a) equipment purchased under this regulation is submitted to a test;
- (b) the test leads to the bringing of proceedings for an offence under regulation 15(1)(a) or the serving of an enforcement notice; and
- (c) a person—
 - (i) from whom the equipment was purchased;
 - (ii) who is a party to the proceedings; or

- (iii) who has an interest in equipment which is identified as infringing goods in an enforcement notice,

requests the Secretary of State to allow that person to have the equipment tested, the Secretary of State shall, if it is practicable for such a test to be carried out, allow that person to have the equipment tested.

Power to require production of documents and information by notice

11.—(1) If the Secretary of State reasonably believes that a person possesses information or documents (other than technical documentation or other information retained by a producer as referred to in regulation 8) which may provide evidence as to whether or not the requirements of Part 2 have been contravened in a particular case or class of cases or by a particular person, the Secretary of State may give that person notice in writing, requiring that person to provide the Secretary of State with that information, those documents, or copies of them.

(2) A notice given under paragraph (1) shall state the period of time within which the person to whom it is given must comply with it: this shall be a period which is reasonable in all the circumstances, and shall not in any event be less than 14 days.

Further powers to obtain evidence

12.—(1) The powers specified in paragraphs (3) and (4) may be exercised where the Secretary of State reasonably believes that their exercise will enable the Secretary of State to obtain evidence as to whether or not the requirements of Part 2 have been contravened in a particular case or class of cases or by a particular person.

(2) Before exercising any of the powers specified in paragraph (3) or (4), enforcement officers shall, if so requested, produce a copy of their authorisations to act as enforcement officers.

(3) Enforcement officers may—

- (a) enter at any reasonable time any premises other than premises occupied only as a person's residence;

- (b) examine and investigate—

- (i) any process of assembly or manufacture; or

- (ii) any other aspect of the supply,

of electrical and electronic equipment, or the component parts of such equipment, taking place on, or organised from, such premises;

- (c) take such measurements and photographs and make such recordings as are necessary for the purpose of any examination or investigation under sub-paragraph (b)(i); and

- (d) require any person on such premises to afford them such facilities and assistance with respect to any matters or things within that person's control or in relation to which that person has responsibilities as are necessary to enable them to exercise any of the powers conferred on them by sub-paragraphs (b) and (c) with due regard to the health and safety of themselves and others.

(4) When enforcement officers have exercised the power of entry under paragraph (3)(a), or when, with a view to ascertaining whether or not the requirements of Part 2 have been contravened in a particular case or class of cases or by a particular person, they have agreed to meet, at a specified time and place, a person in whose possession they reasonably believe there is evidence of the kind referred to in paragraph (1), they may—

- (a) take samples of any articles or substances found on or in the vicinity of the premises they have entered or which are in that person's possession;

- (b) require any person on the premises or at the meeting to produce, or, where the information is recorded in computerised form, furnish extracts in legible form from, any records to which that person has access—

- (i) which are required to be kept under regulation 8;

- (ii) which it is necessary for the enforcement officers to see for the purposes of an examination or investigation under paragraph (3)(b); or
- (iii) which take the form of existing documents which the Secretary of State could require to be produced under regulation 11,

and inspect and take copies of, or of any entry in, the records; and

- (c) take possession of articles or substances of the kind referred to in sub-paragraph (a) or records of the kind referred to in sub-paragraph (b), and detain them for so long as is necessary to—
 - (i) examine them, or cause them to be examined;
 - (ii) ensure that they are not tampered with before examination of them is completed; and
 - (iii) ensure that they are available for use in evidence in any proceedings for an offence under regulation 16(1) or (3).

(5) Where enforcement officers exercise a power conferred by paragraph (4)(a) or (b), instead of immediately—

- (a) taking the samples, articles or substances; or
- (b) requiring the production of the records,

they may require them (or, in the case of records, copies of them) to be produced at such time and place and by such means as they may reasonably specify.

Powers of entry: supplementary

13.—(1) When enforcement officers enter premises by virtue of regulation 12(3)(a), they may take with them such other persons and such equipment or materials as they reasonably consider it necessary or expedient to have with them—

- (a) for the purpose of establishing whether there has been a contravention of the requirements of Part 2; and
- (b) to assist them in exercising any of their powers under regulation 12(3)(b) and (c).

(2) Enforcement officers who enter any premises by virtue of paragraph (3)(a) may direct that those premises, or any part of them, or anything in them, shall be left undisturbed for so long, and to such extent, as is reasonably necessary for the purpose of the exercise of any of their powers under regulation 12(3)(b) and (c).

(3) Where enforcement officers leave any premises that they have entered by virtue of regulation 12(3)(a) and such premises are unoccupied or their occupier is temporarily absent, they shall leave them as effectively secured against a trespasser as they found them.

(4) If enforcement officers or other persons who enter any premises by virtue of this regulation disclose to any person any information obtained by them in the premises with regard to any secret manufacturing process or trade secret, they shall, unless the disclosure was made in the performance of their duty, be guilty of an offence.

(5) It shall not be an offence under paragraph (4) for a person to disclose information in circumstances where—

- (a) the person from whom the information was received has consented to the disclosure; or
- (b) the information is disclosed more than 50 years after it was received.

Compliance notice

14.—(1) Where there are reasonable grounds for suspecting that any of the requirements of Part 2 have not been complied with, the Secretary of State may serve a notice on the producer.

(2) A notice served under paragraph (1) (a “compliance notice”) shall—

- (a) state that the Secretary of State suspects a requirement of Part 2 (a “relevant requirement”) has been contravened;

- (b) state why the Secretary of State suspects that the relevant requirement has been contravened and specify the goods in respect of which it has been contravened;
- (c) require the producer to whom notice is given—
 - (i) to comply with the relevant requirement; or
 - (ii) to provide evidence to the Secretary of State demonstrating that the relevant requirement has been complied with;
- (d) specify the period of time within which the producer must comply with the notice; and
- (e) warn the producer that, unless the requirements of the notice are complied with within the period which it specifies—
 - (i) where a contravention of regulation 7 is suspected, the Secretary of State may take further action under regulation 15; and
 - (ii) the producer may be prosecuted.

Enforcement notice

15.—(1) Where the Secretary of State serves a compliance notice on a producer on the grounds of a suspected contravention of regulation 7 and—

- (a) the producer fails to comply with a requirement in the compliance notice to comply with regulation 7; or
- (b) notwithstanding any evidence which the producer has provided in response to a requirement in the compliance notice to provide evidence demonstrating compliance with regulation 7, the Secretary of State has reasonable grounds for suspecting that the contravention has occurred and is continuing,

the Secretary of State may serve a further notice on the producer.

(2) A notice served under paragraph (1) (an “enforcement notice”) shall—

- (a) specify the goods in respect of which the Secretary of State considers that regulation 7 has been contravened (the “infringing goods”);
- (b) state, in relation to the infringing goods—
 - (i) why the Secretary of State considers that the producer has contravened regulation 7; and
 - (ii) any respect in which the Secretary of State considers that the producer has failed to comply with a compliance notice;
- (c) specify the date, not less than 21 days from the date of the notice, by which the producer is required to comply with the notice; and
- (d) state the judicial remedies available to the producer and the time limits to which those remedies are subject.

(3) An enforcement notice may—

- (a) require the infringing goods to be withdrawn from the market; or
- (b) prohibit or restrict the putting on the market of the infringing goods.

Offences

16.—(1) A person who contravenes or fails to comply with any of the requirements of—

- (a) regulation 7,
- (b) regulation 8, or
- (c) an enforcement notice.

shall be guilty of an offence.

(2) A person who intentionally obstructs an enforcement officer who is acting pursuant to any provision of this Part shall be guilty of an offence.

(3) A person who is subject to a requirement imposed under regulation 11 or paragraphs (3) to (5) of regulation 12 to provide information, documents or records (or copies of information, documents or records) shall be guilty of an offence—

(a) if that person fails, without reasonable excuse, to comply with that requirement; or

(b) if—

(i) any information, document or record which that person provides in response to that requirement is false or misleading in a material respect; or

(ii) any statement which that person makes in response to that requirement is false or misleading in a material respect,

and that person either knows that it is false or misleading in a material respect or is reckless as to whether it is false or misleading in a material respect.

Penalties

17.—(1) A person who is guilty of an offence under regulation 16(1)(a) or (c) shall be liable—

(a) on summary conviction, to a fine not exceeding the statutory maximum;

(b) on conviction on indictment, to a fine.

(2) A person who is guilty of an offence under regulation 16(1)(b), (2) or (3) shall be liable on summary conviction to a fine not exceeding level 5 on the standard scale.

Power of the court to require matter to be remedied

18.—(1) Where a person is convicted of an offence under regulation 16(1) in respect of any matters which appear to the court to be matters which it is in that person's power to remedy, the court may, in addition to or instead of imposing any punishment, order that person, within such time as may be fixed by the order, to take such steps as may be specified in the order for remedying those matters.

(2) The time fixed by an order under paragraph (1) may be extended or further extended by order of the court on an application made before the end of that time as originally fixed or as extended under this paragraph, as the case may be.

(3) Where a person is ordered under paragraph (1) to remedy any matters, that person shall not be guilty of an offence under regulation 16(1) in respect of those matters in so far as they continue during the time fixed by the order or any further time allowed under paragraph (2).

Recovery of expenses of enforcement

19.—(1) This regulation applies where a court convicts a person of an offence under regulation 16(1)(a) or (c).

(2) The court may (in addition to any other order it may make as to costs or expenses) order the person convicted to reimburse the Secretary of State for any expenditure which the Secretary of State has incurred in investigating the offence, including in having the electrical and electronic equipment in respect of which the offence was committed tested.

Commencement of proceedings

20. In England and Wales a magistrates' court may try an information, and in Northern Ireland a magistrates' court may try a complaint, in relation to an offence under these Regulations if the information is laid or if the complaint is made within twelve months from the time when the offence is committed. In Scotland summary proceedings for such an offence may be begun at any time within twelve months from the time when the offence is committed.

Defence of due diligence

21.—(1) Subject to the following provisions of this regulation, in proceedings for an offence under these Regulations, a person who is shown to have taken all reasonable steps and exercised all due diligence to avoid committing the offence shall have a defence.

(2) Where, in any proceedings against a person for such an offence, the defence provided by paragraph (1) involves an allegation that the commission of the offence was due to—

- (a) the act or default of another; or
- (b) reliance on information given by another,

such a defence shall not, without leave of the court, be relied on unless, not later than seven clear days before the hearing of the proceedings (or, in Scotland, the trial diet), that person has served a notice in accordance with paragraph (3) on the person bringing the proceedings.

(3) A notice under this regulation shall give such information identifying or assisting in the identification of the person who committed the act or default or gave the information as is in the possession of the person serving the notice at the time it is served.

(4) A person shall not be entitled to rely on the defence provided by paragraph (1) by reason of that person's reliance on information supplied by another, unless it is shown that it was reasonable in all the circumstances for that person to have relied on the information, having regard in particular to—

- (a) the steps which that person took and those which might reasonably have been taken, for the purpose of verifying the information; and
- (b) whether that person had any reason to disbelieve the information.

Liability of persons other than the principal offender

22.—(1) Where the commission by a person of an offence under these Regulations is due to anything which another person did or failed to do in the course of a business, that other person shall be guilty of the offence and may be proceeded against and punished, whether or not proceedings are taken against the first person.

(2) Where a body corporate commits an offence and it is proved that the offence was committed—

- (a) with the consent or connivance of an officer of the body corporate; or
- (b) as a result of the negligence of an officer of the body corporate,

the officer, as well as the body corporate, shall be guilty of the offence.

(3) In paragraph (2) a reference to an officer of a body corporate includes a reference to—

- (a) a director, manager, company secretary or other similar officer of the body corporate;
- (b) a person purporting to act as a director, manager, company secretary or other similar officer; and
- (c) if the affairs of a body corporate are managed by its members, a member.

(4) In this regulation references to a "body corporate" include references to a partnership in Scotland, and in relation to such partnership, any reference to a director, manager, company secretary or other similar officer of a body corporate is a reference to a partner.

Service of documents

23.—(1) Any document required or authorised by these Regulations to be served on a person may be so served—

- (a) by delivering it to that person or by leaving it at that person's proper address or by sending it by post to that person at that address; or
- (b) if a person is a body corporate, by serving it in accordance with sub-paragraph (a) on the company secretary, clerk or other similar officer of that body corporate; or

- (c) if the person is a partnership, by serving it in accordance with sub-paragraph (a) on a partner or on a person having control or management of the partnership business.

(2) For the purposes of paragraph (1), and for the purposes of section 7 of the Interpretation Act 1978(a) (which relates to the service of documents by post) in its application to that paragraph, the proper address of any person on whom a document is to be served in accordance with these Regulations shall be that person's last known address except that—

- (a) in the case of service on a body corporate or its secretary or clerk, it shall be the address of the registered or principal office of the body corporate;
- (b) in the case of service on a partnership or a partner or a person having the control or management of a partnership business, it shall be the principal office of the partnership;

and for the purposes of this paragraph, the principal office of a company registered outside the United Kingdom or of a partnership carrying on business outside the United Kingdom is its principal office within the United Kingdom.

PART 4

Miscellaneous

Continuity of obligations under the 2006 Regulations

24.—(1) Any act or omission which would have constituted a failure to comply with the provisions of regulations 7, 8 or 9 of the 2006 Regulations while they were in force may be treated in all respects as a contravention of the corresponding requirements of Part 2 of these Regulations.

(2) This includes any act or omission relating to spare parts for the repair, or to the reuse, of electrical and electronic equipment put on the market after 1st July 2006, but the provisions of these Regulations shall not be applied in respect of spare parts for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1st July 2006.

(3) Any question as to whether a requirement of regulations 7, 8 or 9 of the 2006 Regulations was complied with while they were in force may be investigated as if it was a question about compliance with the corresponding requirement of Part 2 of these Regulations, and regulation 16(2) and (3) shall apply accordingly in respect of any such investigation.

Restrictions on enforcement powers and use of certain evidence under them

25.—(1) Nothing in these Regulations shall be taken as—

- (a) requiring a person to produce any document which that person would be entitled to refuse to produce in any proceedings in any court on the grounds that it is the subject of legal professional privilege or, in Scotland, that it contains a confidential communication made by or to an advocate or solicitor in that capacity; or
- (b) authorising a person to take possession of any document which is in the possession of a person who would be so entitled.

(2) A statement by a person in response to a requirement imposed by virtue of regulation 11 may only be used in evidence against that person—

- (a) on a prosecution for an offence under regulation 16(3)(b); or
- (b) on a prosecution for some other offence where in giving evidence that person makes a statement inconsistent with it.

(3) But the statement may not be used against that person by virtue of paragraph (2)(b) unless evidence relating to it is adduced, or a question relating to it is asked, by or on behalf of that person in the proceedings arising out of the prosecution.

(a) 1978 c 30

Amendment of the Enterprise Act 2002 (Part 9 Restrictions on Disclosure of Information) (Specification) Order 2004

26.—(1) The Enterprise Act 2002 (Part 9 Restrictions on Disclosure of Information) (Specification) Order 2004(a) is amended as follows.

(2) In Schedule 1, for the words “The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2006” substitute “The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008”.

10th January 2008

Malcolm Wicks
Minister of State for Energy,
Department for Business, Enterprise and Regulatory Reform

(a) S.I. 2004/693.

SCHEDULE

Regulation 4

Categories of electrical and electronic equipment

1. Large household appliances.
2. Small household appliances.
3. IT and telecommunications equipment.
4. Consumer equipment.
5. Lighting equipment.
6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools).
7. Toys, leisure and sports equipment.
8. Automatic dispensers.

EXPLANATORY NOTE

(This note is not part of the Regulations)

These Regulations revoke and replace the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2006 (S.I. 2006/1463) which implemented the European Parliament and Council Directive 2002/95/EC (OJ L 37, 13.3.2003, p. 19) on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (“the Directive”). The Annex to the Directive can be amended by Commission Decisions and the 2006 Regulations reflected the amendments made to the Directive by Commission Decision 2005/618/EC (OJ L 214, 19.8.2005, p. 65), Commission Decision 2005/717/EC (OJ L 271, 15.10.2005, p. 48), Commission Decision 2005/747/EC (OJ L 280, 25.10.2005, p. 18) and Commission Decision 2006/310/EC (OJ L 115, 28.4.2006, p. 38).

Since the 2006 Regulations were made, the Directive has been amended by a further three decisions: Commission Decision 2006/690/EC (OJ L 283, 14.10.2006, p. 47), Commission Decision 2006/691/EC (OJ L 283, 14.10.2006, p. 48) and Commission Decision 2006/692/EC (OJ L 283, 14.10.2006, p. 50). All three decisions amend the list of exempt applications of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers to which the Directive does not apply, which is set out in the Annex to the Directive. It is expected that the Annex will be subject to further amending decisions over time: an up to date record of such decisions can be found on the European Commission’s website at http://ec.europa.eu/environment/waste/weee/legis_en.htm and an up to date list of exempt applications can be found at <http://www.berr.gov.uk/innovation/sustainability>.

These Regulations apply to new electrical and electronic equipment within the categories set out in the Schedule and to electric light bulbs and to luminaires for use in households that are put on the market on or after 1st July 2006 (when the 2006 Regulations came into force: regulation 24(1)).

These Regulations do not apply to—

- (a) spare parts for the repair of electrical and electronic equipment or to the reuse of such equipment put on the market before 1st July 2006 (regulation 24(2)); and
- (b) the applications of lead, mercury, cadmium, hexavalent chromium and polybrominated diphenyl ethers listed in the Annex to the Directive, as amended from time to time (regulation 5).

General requirements relating to the putting on the market on or after 1st July 2006 of new electrical and electronic equipment are set out in Part 2. New equipment put on the market must not contain more than the permissible maximum concentration values of hazardous substances (regulation 7). Regulation 8 sets out requirements relating to technical documentation.

The Secretary of State has the duty of enforcing the Regulations (regulation 9) and may appoint any person to act on its behalf. The Secretary of State has the power to make test purchases (regulation 10), require production of documents and information (regulation 11) and serve compliance and enforcement notices in cases of suspected non-compliance with the requirements of Part 2 (regulations 14 and 15). Enforcement officers acting on the Secretary of State’s behalf have powers to enter premises and carry out various information-gathering functions (regulations 12 and 13).

Any person who contravenes or fails to comply with the requirements of Part 2 or an enforcement notice shall be guilty of an offence; there are also procedural offences of obstruction and providing false or misleading information (regulation 16). Penalties for such offences are set out in regulation 17. The current maximum fine under level 5 on the standard scale is £5000. Where regulation 7 has been contravened, the court may also order the defendant to take remedial action or pay the costs of the Secretary of State’s investigation (regulations 18 and 19). Proceedings in relation to offences may be commenced within 12 months of the offence being committed (regulation 20). A defence of due diligence is provided in regulation 21 and the liability of persons

other than the principal offender is set out in regulation 22. There is provision for service of documents under the Regulations under regulation 23.

These Regulations will be included amongst the subordinate legislation which has been specified for the purposes of Part 9 of the Enterprise Act 2002 relating to the disclosure of information (regulation 26).

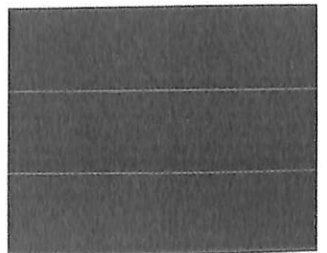
An Impact Assessment (IA) in respect of these Regulations is available and a copy can be obtained from the Department for Business, Enterprise and Regulatory Reform. As these Regulations transpose the Directive, a transposition note (TN) setting out how the Government will transpose the Directive into UK law has been prepared. Copies of the IA and TN are available from the Enterprise and Business Group, Department for Business, Enterprise and Regulatory Reform, 1 Victoria Street, London SW1H 0ET. Copies of these documents have been placed in the libraries of both Houses of Parliament.

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ภาคผนวก จ
สารทั้ง 6 ชนิดที่ถูกลควบคุมตาม RoHS

สารเคมีที่ถูกลบตามระเบียบกฎหมาย RoHS

สารอันตราย	เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ	ผลกระทบต่อสุขภาพและสิ่งแวดล้อม
1) สารตะกั่ว (Pb)	<p>การใช้งานตะกั่วในอุตสาหกรรมไฟฟ้าและอิเล็กทรอนิกส์ ตะกั่วใช้เป็นฉนวนป้องกันกระแสไฟฟ้าและใช้เป็นตัวถ่วงน้ำหนักได้ดี การที่เป็นโลหะที่นิ่มอ่อนตัว และตีขึ้น ทำให้ตะกั่วถูกนำไปใช้เป็นขดลวดเพื่ออุดรอยร้าวตามข้อต่อหรือใช้ผสมโลหะอื่นเพื่อทำเป็นแปรง ปะเก็น และแหวนรอง นอกจากนี้ ความนิ่มและสีนของตะกั่วช่วยให้สามารถดึงเส้นหรือแผ่นโลหะได้ง่ายขึ้น ชิ้นส่วนโลหะที่ผลิตโดยการลากขึ้นรูป (Drawing) จึงมักมีตะกั่วผสม</p>	<p>ตะกั่วเป็นโลหะที่เป็นพิษต่อสิ่งมีชีวิตที่สามารถตรวจพบได้ในสิ่งแวดล้อมในแทบทุกสภาพตะกั่วเป็นโลหะที่ไม่มีพิษภัยในสิ่งแวดล้อม มีพิษสะสมเร็วขึ้น เมื่อสะสมในร่างกายในปริมาณมากจะก่อให้เกิดอาการบวมของระบบประสาท การสืบพันธุ์ พัฒนาการทางสมองและทางกายภาพล่าช้าโดยเฉพาะในเด็กปริมาณการผลิตฮีโมโกลบินซึ่งเป็นส่วนประกอบสำคัญของเม็ดเลือดลดลง</p> <p>ตามปกติร่างกายมนุษย์สามารถทนสารตะกั่วในระดับหนึ่ง แต่หากได้รับตะกั่วในปริมาณมากๆ ในทันทีจะเกิดการเฉียบพลัน (Acute Toxic) อาการที่เกิดขึ้นอยู่กับเส้นทางการเข้าสู่ร่างกาย อาการทั่วไป เช่น ปวดท้องอย่างรุนแรง ใจวาย ช็อก ตื่นเต้นง่าย ความจำเสื่อม เป็นต้น อาการที่เกิดจากการได้รับสารตะกั่วที่ละน้อยเป็นเวลานาน ซึ่งเป็นอาการที่เกิดกับบุคคลที่มีอาชีพสัมผัสผลิตภัณฑ์ได้แก่ อาการโลหิตจาง เนื่องจากตะกั่วไปแทนที่เหล็กในเม็ดเลือดแดงตะกั่วบางส่วนสามารถสะสมในกระดูกและฟัน โดยการแทนที่แคลเซียมทำให้มีอาการปวดตาม</p>

<p>สารอันตราย</p>	<p>เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ</p>	<p>ผลกระทบต่อสุขภาพและสิ่งแวดล้อม</p>
<p>ข้อ และกระดูกหักง่าย ตะกั่วยังสามารถสะสมในไขมัน ระบบประสาท ระบบน้ำเหลือง ตับ และไต อากาศที่พบส่วนใหญ่ ได้แก่ อากาศทางระบบย่อยอาหาร เช่น ปวดท้อง น้ำหนักลด เบื่ออาหาร คัดินได้ อาเจียน ท้องผูก อากาศทางประสาทและสมอง ทำให้ทรงตัวไม่อยู่ ประสาทหลอน ซึมไม่รู้สึกตัว ชัก มือเท้าตก อัมพาต และอาจตายได้</p> <p>ตามปกติร่างกายมนุษย์จะดูดซับตะกั่วได้ประมาณ 5-15% ของปริมาณตะกั่วที่เข้าสู่ร่างกายและเกินกว่า 95% ของตะกั่วที่ถูกดูดซับจะถูกขับถ่ายออก มีเพียง 0.25 - 0.75% ของตะกั่วที่เข้าสู่ร่างกายที่จะถูกสะสมไว้ ดังนั้น หากไม่ได้รับตะกั่วในปริมาณมาก ในทันทีหรือได้รับสะสมติดต่อกันเป็นเวลานานร่างกายมนุษย์ก็สามารถทนตะกั่วได้ระดับหนึ่งอย่างไรก็ดี ร่างกายเด็กสามารถดูดซับสารตะกั่วได้ดีกว่าผู้ใหญ่มากเมื่อประกอบกับพัฒนาการทั้งทางสมองและทางกายภาพของเด็กที่ยังไม่สมบูรณ์ การได้รับสารตะกั่วในวัยเด็กจึงส่งผลร้ายมากกว่าการได้รับสารเมื่อเป็นผู้ใหญ่มาก</p> <p>ประเด็นของสารตะกั่วที่เกี่ยวข้องกับอุตสาหกรรมไฟฟ้า และอิเล็กทรอนิกส์ ได้แก่</p>		

สารอันตราย	เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ	ผลกระทบต่อสุขภาพและสิ่งแวดล้อม
2) สารปรอท (Hg)	<p>การใช้งานปรอทในอุตสาหกรรมไฟฟ้าอิเล็กทรอนิกส์ เนื่องจากปรอทเป็นโลหะที่เป็นของเหลว อุดมภูมิห้อง ไหลตัวได้ดี และมีความนำไฟฟ้าสูงจึงถูกนำมาใช้เป็นเครื่องบอกระดับภูมิ (ปรอทวัดอุณหภูมิ) เครื่องวัดความดัน และสวิตช์ และเนื่องจากเป็นของเหลวที่ระเหยกลายเป็นไอและถูกทำให้อยู่ในสภาวะ “กระตุ้น” (Excited state) ได้ง่ายการกลับเข้าสู่สภาวะปกติ (Ground State) ของปรอทจะปลดปล่อยรังสีในช่วง UV ซึ่งสามารถนำไปกระตุ้น</p>	<p>ผลกระทบต่อสุขภาพและสิ่งแวดล้อม</p> <ul style="list-style-type: none"> • โอกาสปนเปื้อนสู่สิ่งแวดล้อม (จากการทิ้งเครื่องใช้ที่หมดอายุโดยไม่มีการควบคุม) • ของเสียจากกระบวนการผลิตที่ถูกปล่อยออกสู่สิ่งแวดล้อม • โอกาสที่จะได้รับไอตะกั่วผู้ที่มีผงตะกั่วปะปนหรือตะกั่วเข้าปากโดยตรง ของคนงานโรงงานผู้ประกอบการรีไซเคิลหรือครอบครัว/ผู้ใกล้ชิดผู้ที่มีอาชีพต้องสัมผัสกับตะกั่วผ่านทางคนงาน (เศษฝุ่นที่ติดรองเท้า เสื้อผ้า หรือตามร่างกายคนงาน)
		<p>ปรอทเป็นสารพิษ ทั้งในรูปสารอินทรีย์และสารอนินทรีย์ มนุษย์สามารถดูดซึมเข้าร่างกายได้ทั้งทางทางเดินหายใจทางระบบทางเดินอาหารและซึมผ่านทางผิวหนัง ปรอทเป็นสารพิษเรื้อรังปกติมักไม่พบอาการของพิษปรอทเฉียบพลัน ปรอทจะเป็นพิษต่อร่างกายเมื่อซึมเข้าในระบบการหมุนเวียนโลหิต โดยผ่านทางระบบย่อยอาหารหรือในปอด สารปรอทระเหยได้ในอากาศ และไอปรอทไม่มีสีและไม่มีกลิ่น โอกาสที่จะได้รับสารนี้ในที่มีมีการปนเปื้อนจึงสูงเมื่อได้รับเป็นเวลานานจะสะสมจนถึงระดับที่เป็นอันตรายต่อร่างกาย ปรอทในรูปสารที่ประกอบที่</p>

<p>สารอันตราย</p>	<p>เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ</p> <p>สารเรืองแสงได้หลายชนิดที่กระบวนการนี้ก่อให้เกิดแสงสว่างได้โดยใช้พลังงานไม่มาก หลอดไฟที่มีปรอทเป็นองค์ประกอบหลัก (หลอดฟลูออเรสเซนต์ และหลอดไอปรอท Mercury Vapor Lamp) จึงเป็นหลอดไฟที่สมรรถนะทางสิ่งแวดล้อมสูงสุดในปัจจุบัน</p>	<p>ผลกระทบต่อสุขภาพและสิ่งแวดล้อม</p> <p>เป็นสารระเหยง่าย เช่น โดเมทิลเมอร์คิวรี หรือสารประกอบที่ละลายน้ำได้ง่าย เมอร์คิวรี (II) ในธรรมชาติมีอันตรายมากกว่าโลหะปรอทเนื่องจากสามารถเข้าสู่ร่างกายโดยผ่านทางโซอาหาร</p> <p>ในอดีตเคยมีความเชื่อว่า การทิ้งสารประกอบปรอทลงในแม่น้ำ และทะเลสาบเป็นสิ่งที่ปลอดภัยเนื่องจากสารประกอบปรอทส่วนใหญ่ไม่ละลายน้ำและเชื่อว่าสารประกอบปรอทจะค่อยๆ เปลี่ยนเป็น เมอร์คิวรี (II) ซัลไฟด์ซึ่งจะละลายได้ยากมากและจะจมอยู่ใต้น้ำอย่างใดก็ได้ ในปัจจุบันได้มีหลักฐานพิสูจน์ได้ชัดเจนว่าการกระทำเช่นนี้เป็นอันตรายร้ายแรงมาก เนื่องจากธาตุปรอทและสารประกอบเมอร์คิวรี (II) จะถูกเปลี่ยนเป็นสารประกอบเมอร์คิวรี (II) อย่างช้าๆ จากนั้นเมบคทีเรียในน้ำจะเปลี่ยนเมอร์คิวรี (II) เป็นโดเมทิลเมอร์คิวรี ((CH₃)₂Hg) ซึ่งสารนี้จะไปสะสมในพืชและสัตว์น้ำขนาดใหญ่โตเมทิลเมอร์คิวรีจะถูกถ่ายทอดมายังปลาขนาดใหญ่ขึ้นและเข้าสู่ห่วงโซ่อาหารของมนุษย์ในที่สุด ในการพิสูจน์ปลาฉลามและปลาคาบบังกิงปลาเป็นอาหารพบปริมาณปรอทในระดับอันตราย ซึ่งก่อนหน้านี้จะพิสูจน์ได้เกิดเหตุผู้คนเจ็บป่วยเนื่องจากพิษปรอทหลายกรณี ตัวอย่างที่สำคัญได้แก่ ที่เมือง มินามาตะ ประเทศญี่ปุ่น ที่</p>
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<p>สารอันตราย</p>	<p>เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ</p>	<p>ผลกระทบต่อสุขภาพและสิ่งแวดล้อม</p>
<p>โรงงานอุตสาหกรรมที่ปรอทในอากาศเป็นเวลานาน ในช่วง 10 ปี ที่พบโรคนี้อาจมีประชาชนกว่า 50 คนที่บริโภคปลาจากอ่าวเป็นอาหารตายด้วยพิษปรอท ที่เหลืออีกจำนวนมากป่วยด้วยโรคมินามาตะและเด็กจำนวนมากเกิดมาผิดปกติ ภาพ และ พิการ ทางสมอง ประเทศอิรักเคยมีสถิติผู้ป่วยจาก ไคเมทิลเมอร์คิวรี สูงสุดถึง 6,000 คน และตายกว่า 500 คน ในปี 1971 การปนเปื้อนปรอทในกรณีนี้มาจากขุมขี้เถ้าจากแปรงสีฟันนำเข้า ประเทศในรูปแบบเม็ดสีขาวที่เกือบด้วยขี้เถ้าที่มีเมทิลเมอร์คิวรีเป็นส่วนผสม</p> <p>โดยปกติร่างกายมนุษย์สามารถกำจัดปรอทจากร่างกายได้ระดับหนึ่ง จากการศึกษาพบว่าสารประกอบอินทรีย์ของปรอทมีครึ่งชีวิตในร่างกายประมาณ 6 วัน กล่าวคือใน 6 วัน ร่างกายจะสามารถกำจัดปรอทที่รับมาได้ครึ่งหนึ่ง ดังนั้น หากได้รับในปริมาณไม่มากและไม่บ่อยร่างกายจะขับถ่ายปรอทออกมาได้ทัน ในทางตรงข้ามสารประกอบอินทรีย์ของปรอท (ที่มากในปลา) มีครึ่งชีวิตเฉลี่ยในร่างกายประมาณ 70 วัน และอาจนานกว่านั้นในอวัยวะบางประเภทเช่น สมอง หากได้รับสารนี้เป็นประจำแม้ครึ่งจะไม่มากปริมาณสารปรอทในร่างกายจะ</p>		

สารอันตราย	เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ	ผลกระทบต่อสุขภาพและสิ่งแวดล้อม
3) สารแคดเมียม (Cd)	<p>การใช้งานแคดเมียมในอุตสาหกรรมไฟฟ้าและอิเล็กทรอนิกส์ แคดเมียมในรูปโลหะมักใช้เคลือบเพื่อป้องกันการกัดกร่อนเหล็กกล้า แคดเมียมเป็นส่วนประกอบสำคัญในอัลลอยด์สำหรับเชื่อมประสาน (Brazing) และ บัดกรี และเป็นสารอัลลอยด์สำคัญในทองแดง สารประกอบแคดเมียม (CdO) เคยถูกใช้อย่างกว้างขวางในการผลิตแบตเตอรี่ (Ni-Cd) ก่อนที่จะถูกห้ามใช้ แคดเมียมซัลไฟด์และเกลืออินทรีย์ของแคดเมียมใช้เป็นเม็ดสีและสารเพิ่มเสถียรภาพในพลาสติก</p>	<p>สะสมมากขึ้นจนถึงระดับอันตรายได้ พรอทัมพิชทำลายประสาทส่วนกลาง ทำให้ความจำเสื่อม บุคลิกภาพและพฤติกรรมเปลี่ยนแปลง กระเพาะอาหารและลำไส้ผิดปกติ ผื่นแดง ทำลายสมองและไต</p> <p>ไอรระเหยและฝุ่นแคดเมียมเป็นสารพิษเฉียบพลัน (Acute Toxic) หากสูดเข้าร่างกายในปริมาณที่สูง เนื่องจากไอรระเหยของแคดเมียมมีฤทธิ์กัดกร่อน เมื่อได้รับทางการหายใจจะก่อให้เกิดการระคายเคือง เจ็บคอ ไอ หายใจขัด หายใจลำบาก เมื่อสัมผัสทางผิวหนังก่อให้เกิดการระคายเคือง เมื่อกินเข้าไปจะเกิดการปวดท้อง ท้องร่วง คลื่นไส้ อาเจียน แคดเมียมกระจายในร่างกายผ่านทางระบบเลือด อัตราการดูดซับแคดเมียมจะสูงในคนที่บริโภคแคดเมียม เหล็ก และ โปรตีนต่ำ เมื่อได้รับแคดเมียมต่อเนื่องเป็นเวลานานจะก่อให้เกิดอาการเรื้อรัง โดยแคดเมียมจะส่งผลกระทบต่อระบบเลือด สะสมในไตและทำลายไต ทำให้ประสิทธิภาพกลืนผิดปกติ ไชของสารนี้ทำให้เกิดโรคปอดอักเสบ ซึ่งหากได้รับเป็นเวลานานอาจถึงตายได้ แคดเมียมเป็นสารก่อมะเร็ง</p>

<p>สารอันตราย</p> <p>4) สารโครเมียมเฮกซะวาเลนต์ (Cr-VI) . (โครเมียม +6)</p>	<p>เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ</p> <p>การใช้งานโครเมียมในอุตสาหกรรมไฟฟ้าและอิเล็กทรอนิกส์ การใช้โครเมียมในอุตสาหกรรมส่วนใหญ่ใช้ในการป้องกันพื้นผิวโลหะจากการกัดกร่อนเป็นหลัก โครเมียมถูกใช้แปรรูปเฟอร์โรโครม ที่ใช้สำหรับผลิตเหล็กกล้าไร้สนิม และอัลลอยโลหะทนไฟ และใช้สำหรับผลิต ซุปเปอร์อัลลอย และอื่นๆ โครเมียมเป็นสารเติมแต่งเพื่อช่วยควบคุมโครงสร้างจุลภาค (Microstructure) ของอลูมิเนียมและทองแดง</p>	<p>ผลกระทบต่อสุขภาพและสิ่งแวดล้อม</p> <p>โครเมียม (6) เป็นโครเมียมที่มีพิษ ที่สามารถซึมผ่านผนังเซลล์ได้โดยง่าย เนื่องจากโคโครเมตเป็นออกซิไดเซอร์ที่แรงมากชนิดหนึ่ง การสูดดมเอาสารนี้เข้าในร่างกายจะก่อให้เกิดการระคายเคืองรุนแรง เกิดการทำลายเยื่อเมือก และทางเดินหายใจส่วนบน ก่อให้เกิดแผลพุพองและเกิดมะเร็งในหนังกำพร้าจมูก ทำให้เกิดการอักเสบบริเวณลำคอ ไอ หายใจถี่เร็ว หายใจลำบาก เกิดอาการเกี่ยวกับโรคปอด หอบหืด เมื่อได้รับในปริมาณมาก อาจทำให้เกิดอาการนำท่วมปอดได้เมื่อได้รับโครเมียม (6) ผ่านทางผิวหนังโดยการสัมผัส จะเกิดเป็นแผลพุพองเริ่มแรกจะไม่มีอาการเจ็บปวดแต่จะทะลุเข้าไปถึงกระดูก ทำให้เกิดรูพรุน (Chrome holes) โครเมียม (6) ที่ถูกดูดซึมจะไปสะสมที่ตับและไต การกลืนเอาโครเมียม (6) เข้าปากก่อให้เกิดการไหม้บริเวณทางเดินอาหารและกระเพาะอาหาร ซึ่งอาจเป็นอันตรายถึงชีวิตได้ ผู้ได้รับโครเมียม (6) ทางปากจะมีอาการเจ็บคอ อาเจียน ท้องร่วง การอักเสบของลำไส้ เส้นเลือดหัวใจบริเวณศีรษะ กระหายน้ำ เกิดตะคิว หมดสติ มีอาการโคม่า การไหลเวียนเลือดผิดปกติ เกิดอาการตับและไตวายเฉียบพลัน การได้รับโครเมียม (6) ติดต่อกันเป็นเวลานานทำให้เกิดมะเร็ง</p>
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สารอันตราย	เป็นส่วนประกอบในผลิตภัณฑ์ไฟฟ้า และอิเล็กทรอนิกส์ต่างๆ	ผลกระทบต่อสุขภาพและสิ่งแวดล้อม
<p>5) สาร โพลีโบรมิเนท - ไบฟีนิล (PBB) และสาร โพลีโบรมิเนท - ไดฟีนิล - อีเทอร์ (PBDE)</p>	<p>ชิ้นส่วนในเครื่องใช้ไฟฟ้าและอิเล็กทรอนิกส์ ที่จำเป็นต้องใช้ BFR ได้แก่ ฉนวนสายไฟ โครงสร้างเครื่องใช้ต่อและรีเลย์ และแผ่นวงจรพิมพ์ ชิ้นส่วนแต่ละประเภทมีส่วนการใช้ BFR ที่แตกต่างกัน เฉพาะ PBB และ PBDE เท่านั้นที่ถูกห้ามใช้ เนื่องจากมีข้อกังวลเรื่องการเกิด ไดออกซินและฟูรานซึ่งเป็นสารก่อมะเร็งในระหว่าง การเผาพลาสติกเพื่อคืนพลังงานซึ่งมี โอกาสอาจเกิดได้หากใช้เตาเผาที่มีประสิทธิภาพต่ำ</p>	<p>ในระบบทางเดินหายใจ เนื่องจากโครเมียม (6) สามารถทำลาย DNA มนุษย์และสิ่งมีชีวิต พืชของโครเมียม (6) จึงส่งผลกระทบต่อไปยังรุ่นลูกหลานทำให้เกิดการกลายพันธุ์ได้ (Mutation) โครเมียม (6) จึงถูกจัดเป็นสารพิษร้ายแรงต่อสิ่งแวดล้อม</p> <p>PBB และ PBDE ถูกห้ามใช้เนื่องจากมีข้อกังวลเรื่องการเกิด ไดออกซินและฟูรานซึ่งเป็นสารก่อมะเร็งในระหว่างการเผาพลาสติกเพื่อคืนพลังงานซึ่งมีโอกาอาจเกิดได้หากใช้เตาเผาที่มีประสิทธิภาพต่ำ</p>

ศูนย์เทคโนโลยีโลหะและวัสดุแห่งชาติ (เอ็มเทค) สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ กระทรวงวิทยาศาสตร์และเทคโนโลยี. (2547). ความรู้เบื้องต้นเกี่ยวกับสารปนเปื้อนในผลิตภัณฑ์. พิมพ์ครั้งที่ 1.

ภาคผนวก จ

มูลค่าการส่งออก-นำเข้าสินค้าไฟฟ้าและอิเล็กทรอนิกส์ไทยกับกลุ่มสหภาพยุโรป

มูลค่าส่งออก-นำเข้าสินค้าไฟฟ้าและอิเล็กทรอนิกส์ไทยกับกลุ่มสหภาพยุโรป

หน่วย : ล้านบาทหรือยูโร

ผลิตภัณฑ์	2546	2547	2548	2549	2550	2551	2552 (01)	2546	2547	2548	2549	2550	2551	2552 (01)
เครื่องไฟฟ้า														
เครื่องวีดีโอ, VCD, DVD	40.87	60.10	34.73	41.55	38.21	20.70	0.48	0.35	1.54	1.02	1.11	1.79	1.75	0.07
ส่วนประกอบเครื่องวีดีโอ, VCD, DVD	97.54	67.03	81.14	111.98	88.21	114.29	4.96	3.44	0.57	0.05	0.09	0.13	0.05	0.00
เครื่องรับโทรทัศน์สี	191.72	240.21	125.11	139.91	68.36	42.96	2.64	1.43	1.85	2.23	1.22	0.56	1.29	0.04
กล่องถ่าย TV, VDO	8.18	101.28	121.91	208.05	282.84	345.68	22.91	1.33	2.14	2.63	4.21	6.31	6.89	0.20
ส่วนประกอบเครื่องรับโทรทัศน์ (สายภาค, ตัววิทยุหรือโทรทัศน์)	31.74	92.09	119.86	106.76	195.91	247.97	13.93	58.07	60.82	62.77	72.30	39.39	38.36	4.51
หลอดภาพโทรทัศน์สี	19.39	34.86	8.59	0.46	0.55	1.70	0.00	0.27	1.94	0.86	1.22	0.00	0.02	0.00
ถ้าฟังขายเสียง, ไมโครโฟน, ชุดเครื่องขยายเสียง	18.77	45.28	40.84	41.31	31.95	34.59	0.90	7.25	6.40	5.79	6.61	7.79	8.27	0.46
เครื่องที่นำรีออนด้วยไฟฟ้าแบบทำน้ำร้อนชั่วคราวหรือแบบทำน้ำรีออนสะสม	0.02	0.42	0.98	1.06	0.26	0.54	0.01	1.43	2.07	1.97	2.34	1.93	2.69	0.22
เดาอบอื่น ๆ รวมทั้งเตาที่มีหม้อหุงต้มในตัว แผ่นสำหรับหุงต้ม บอยดิ้งริง	0.35	0.82	0.02	6.94	16.74	21.72	1.54	2.74	5.02	5.87	7.84	8.05	9.45	0.68
เดาอบไมโครเวฟ	28.40	112.32	124.70	118.26	128.08	97.49	7.08	0.28	0.78	0.71	0.94	1.36	1.18	0.05
หลอดไมโครเวฟ	0.13	0.19	0.25	0.22	0.27	0.21	0.02	0.02	0.07	0.05	0.02	0.00	0.04	0.00
เตารีดไฟฟ้า	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	1.87	2.68	1.10	1.32	1.94	0.02
เครื่องปาดผม	0.09	0.05	0.10	0.13	2.09	1.27	0.00	1.46	0.86	0.90	0.91	0.54	0.68	0.03
เครื่องอุปกรณ์แต่งผมอื่น ๆ	0.18	0.12	0.03	0.00	0.02	0.06	0.00	0.08	0.05	0.11	0.05	0.04	0.04	0.00
เครื่องปิ้งขนมปัง	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.08	0.11	0.10	0.06	0.09	0.00
เครื่องต้มกาแฟ หรือชา	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.62	1.27	1.69	1.71	2.58	3.57	0.30
เดาอบเบเกอรี่ รวมถึงเดาอบบิสกิต	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.81	0.25	1.07	1.41	0.40	0.67

มูลค่าส่งออก-นำเข้าสินค้าไฟฟ้าและอิเล็กทรอนิกส์ไทยกับกลุ่มสหภาพยุโรป

หน่วย : ล้านบาทหรือดอลลาร์

ผลิตภัณฑ์	2546	2547	2548	2549	2550	2551	2552 (01)	2546	2547	2548	2549	2550	2551	2552 (01)
เครื่องอุปโภคบริโภคให้แห้ง	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.12	0.13	0.14	0.13	0.02	0.00
ตัวต้านทานสำหรับทำความร้อนด้วยไฟฟ้า (Heating Resistor)	0.22	0.18	0.22	0.21	0.05	0.02	0.00	1.54	2.44	2.26	2.91	4.34	3.66	0.39
เครื่องกระจายความร้อนแบบจ่ายความร้อนจากแหล่งสะสม	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.06	0.07	0.13	0.06	0.08	0.09	0.01
ส่วนของเครื่องใช้ไฟฟ้าที่ให้ความร้อน	0.61	3.53	4.99	4.79	5.10	2.63	0.14	1.52	2.27	1.67	2.34	2.47	2.32	0.11
เครื่องคอมพิวเตอร์ของเครื่องทำความเย็น	34.40	51.99	73.70	84.92	97.35	99.49	9.21	25.61	14.16	15.51	16.55	11.79	16.80	0.59
พัดลมตั้งโต๊ะ, ตั้งพื้น, ติดผนัง, ติดเพดาน	0.09	0.18	0.17	0.21	5.84	9.35	0.74	0.53	1.23	0.31	0.37	0.48	0.82	0.02
ตู้เย็น ใช้ตามบ้านเรือน	15.27	24.93	35.59	48.76	64.93	87.57	6.68	0.88	1.13	0.99	1.14	1.01	2.14	0.15
ตู้เย็นแช่แข็ง ตู้แช่อื่น ๆ	3.55	6.67	6.65	7.09	10.34	9.93	1.02	21.33	17.95	14.73	19.10	18.19	16.72	1.59
ส่วนประกอบสำหรับติดตั้งอุปกรณ์ทำความเย็น หรือทำให้เย็นจนแข็ง	0.93	1.07	1.17	2.06	3.23	4.60	0.14	5.89	10.20	15.88	8.15	7.83	8.09	3.74
เครื่องปรับอากาศสำหรับที่พักอาศัย โรงงาน	502.28	851.61	683.56	618.75	1,069.59	905.71	43.07	4.47	4.36	3.98	3.92	3.08	5.70	0.31
ส่วนประกอบเครื่องปรับอากาศ	19.23	21.90	19.93	22.21	42.31	69.72	2.05	5.47	1.99	1.68	1.36	1.67	2.58	0.78
เทปแม่เหล็กและงานแม่เหล็ก, แผ่น CD สำหรับบันทึกเสียง, ภาพ	20.41	13.62	11.94	12.92	18.58	7.20	0.15	49.14	44.32	62.97	87.65	66.39	80.61	1.93
เครื่องพ่นแผ่นเสียง เครื่องเล่นแผ่นเสียง, เทป (Sound Reproducer)	22.51	31.19	6.77	1.49	0.71	1.11	0.09	1.89	0.77	0.72	0.81	1.00	1.34	0.06
เครื่องซักผ้า	1.14	1.35	3.25	17.37	18.82	13.07	0.87	6.77	4.83	4.36	3.54	3.62	6.36	0.19
ส่วนประกอบของเครื่องซักผ้า	0.00	0.00	0.01	0.16	0.69	0.64	0.09	0.61	1.88	6.92	10.70	13.94	22.54	1.42
เครื่องซักแห้ง	0.04	0.07	0.32	2.52	6.24	8.43	0.58	0.58	2.51	1.62	1.51	2.78	2.47	0.04
ส่วนประกอบของเครื่องซักแห้ง	0.00	0.01	0.01	0.53	0.31	0.93	0.01	0.38	1.09	1.81	7.44	1.45	3.15	0.05
เครื่องดูดฝุ่น	4.26	4.16	2.17	2.92	1.71	1.95	0.14	9.29	2.81	3.35	3.08	2.77	1.90	0.19

มูลค่าส่งออก-นำเข้าสินค้าไฟฟ้าและอิเล็กทรอนิกส์ ไทยกับกลุ่มสหภาพยุโรป

หน่วย : ล้านบาทเหรียญสหรัฐ

ผลิตภัณฑ์	2546	2547	2548	2549	2550	2551	2552 (01)	2546	2547	2548	2549	2550	2551	2552 (01)
หม้อแปลงไฟฟ้าขนาดใหญ่ (เกิน 1 KV แต่ไม่เกิน 10,000 KVA)	17.40	5.64	7.12	11.12	11.17	6.69	0.38	76.12	15.32	25.13	23.25	23.66	22.26	1.91
หม้อแปลงไฟฟ้าขนาดเล็ก (ไม่เกิน 1 KV)	19.70	12.88	11.29	9.17	12.97	15.93	1.37	3.75	3.17	3.19	3.34	2.90	4.96	0.28
บัลลาสต์สำหรับหลอดฟลูออเรสเซนต์	0.26	0.00	0.02	0.02	0.03	0.02	0.00	1.41	0.53	0.52	0.77	1.35	1.64	0.06
เครื่องเปลี่ยนไฟฟ้าชนิดยูเครที (Power Supply)	61.05	114.39	98.91	104.82	109.55	130.78	8.96	14.11	23.72	24.45	32.59	26.73	37.58	2.11
ส่วนประกอบของหม้อแปลงไฟฟ้า	1.50	2.61	1.62	0.97	4.65	9.47	0.77	3.55	7.79	6.49	13.29	11.60	4.42	0.23
เครื่องใช้ไฟฟ้าอื่น ๆ (เครื่องล้างจาน, ลิฟต์, บันไดเลื่อน, ไฟฉาย, เครื่องให้สัญญาณไฟ)	98.30	198.92	171.42	160.04	245.48	254.33	27.64	121.48	190.78	288.38	264.43	253.66	284.81	15.46
รวมเครื่องไฟฟ้า	1,535.78	2,474.20	2,106.55	2,201.19	2,970.64	2,960.70	180.99	701.57	717.51	912.06	990.49	974.14	1,097.64	77.60

ข้อมูล : สถาบันไฟฟ้าและอิเล็กทรอนิกส์ ที่มา : กรมศุลกากร

มูลค่าส่งออก-นำเข้าสินค้าไฟฟ้าและอิเล็กทรอนิกส์ ไทยกับกลุ่มสหภาพยุโรป

หน่วย : ล้านบาทหรือดอลลาร์

ผลิตภัณฑ์	2546	2547	2548	2549	2550	2551	2552 (01)	2546	2547	2548	2549	2550	2551	2552 (01)
เครื่องอิเล็กทรอนิกส์														
เครื่องคอมพิวเตอร์ ครอบชุด, Notebook, Palm	0.47	3.21	0.35	0.42	3.65	1.44	0.04	16.22	5.48	6.86	8.56	18.19	12.42	1.20
ส่วนประกอบของอุปกรณ์เครื่องคอมพิวเตอร์	1,419.08	1,634.79	2,090.14	2,758.72	3,093.78	3,200.53	199.18	214.57	76.09	89.05	111.42	106.60	221.31	13.58
เครื่องคำนวณอิเล็กทรอนิกส์	1.19	0.12	0.01	0.02	1.03	0.02	0.00	0.07	0.68	0.43	0.76	0.02	0.31	0.00
วงจรรวมและ ไมโครแอสเซมบลี (Integrated Circuit)	913.51	787.75	730.56	810.46	939.14	677.99	48.28	292.47	469.10	550.43	544.99	670.46	578.45	32.36
วงจรมีพิมพ์ (Printed Circuit)	91.26	135.65	145.28	203.70	276.30	223.91	10.37	4.88	16.47	13.99	26.72	17.98	17.96	0.80
ตัวเก็บประจุอิเล็กทรอนิกส์	13.17	16.56	16.83	15.08	19.82	14.97	1.83	31.48	37.78	48.56	25.68	32.79	45.02	4.66
เครื่องโทรศัพท์	36.46	33.99	32.67	48.78	57.96	57.40	2.55	8.46	6.58	1.51	0.93	2.04	3.73	1.97
เครื่องโทรพิมพ์	0.09	0.08	0.03	0.00	32.57	33.71	1.19	0.00	0.00	0.00	0.00	1.47	3.82	0.05
เครื่องโทรสาร	128.61	162.39	76.93	44.28	13.02	6.56	0.40	0.09	0.03	0.00	0.00	0.03	0.00	0.00
เครื่องอุปกรณ์ใช้สำหรับโทรศัพท์หรือโทรเลข อุปกรณ์อื่น ๆ	27.76	36.14	49.49	70.15	41.63	119.32	7.31	235.27	116.64	129.59	104.75	43.72	74.93	2.33
เครื่องส่ง-เครื่องรับวิทยุโทรเลข วิทยุโทรศัพท์ เครื่องเรดาร์	183.43	226.61	242.86	358.12	380.21	247.93	9.19	4.57	6.16	7.47	7.19	7.95	15.01	0.15
Mobile Telephone	30.01	28.06	25.48	6.32	10.34	9.59	0.26	287.46	99.42	40.82	48.21	12.04	19.20	0.18
ไดโอด ทรานซิสเตอร์และอุปกรณ์กึ่งตัวนำ	56.40	59.00	53.96	79.23	63.87	98.19	4.59	9.67	17.61	18.49	24.43	21.91	19.82	1.06
ตัวเก็บประจุไฟฟ้า (CAPACITOR), Resistor	33.96	35.67	23.86	18.92	18.76	20.80	0.97	9.71	19.13	23.15	23.17	26.47	26.27	1.47
รวมเครื่องอิเล็กทรอนิกส์	2,935.67	3,159.60	3,488.45	4,414.21	4,952.09	4,712.36	286.17	1,115.36	871.18	930.35	926.82	961.66	1,038.25	59.82
รวมทั้งหมด	4,471.45	5,633.80	5,595.00	6,615.40	7,922.73	7,673.06	467.17	1,816.93	1,588.68	1,842.41	1,917.31	1,935.79	2,135.89	137.41

ข้อมูล : สถาบันไฟฟ้าและอิเล็กทรอนิกส์ ที่มา : กรมศุลกากร