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Montreal Protocol on Substances that  
Deplete the Ozone Layer**  
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Item 8 of the provisional agenda of the preparatory segment\*\*  
**Proposed amendments to the Montreal Protocol**

## **Proposed amendment to the Montreal Protocol**

### **Note by the Secretariat**

Pursuant to paragraph 2 of Article 9 of the Vienna Convention for the Protection of the Ozone Layer, the Secretariat is circulating in the annex to the present note a joint proposal submitted by Canada, Mexico and the United States of America to amend the Montreal Protocol in respect of hydrofluorocarbon phase-down. The proposal is being circulated as received and has not been formally edited by the Secretariat.

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## Annex

### Proposed amendment to the Montreal Protocol

#### *Article I: Amendment*

A. *Article 1, paragraph 4*

In paragraph 4 of Article 1 of the Protocol, for the words:

“Annex C or Annex E”  
there shall be substituted:  
“Annex C, Annex E or Annex F”

B. *Article 2, paragraph 5*

In paragraph 5 of Article 2 of the Protocol, for the words:

“and Article 2H”  
there shall be substituted:  
“Articles 2H and 2J”

C. *Article 2, paragraph 5 ter*

The following paragraph shall be added after paragraph 5 *bis* of Article 2 of the Protocol:

“5 *ter*. 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 2 J, provided that the calculated level of consumption of controlled substances in Annex F of the Party transferring the portion of its calculated level of consumption did not exceed [0.25] kilograms per capita in [2008] and that the total combined calculated levels of consumption of the Parties concerned do not exceed the consumption limits set out in Article 2J. 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.”

D. *Article 2, paragraphs 8(a) and 11*

In paragraphs 8(a) and 11 of Article 2 of the Protocol, for the words:

“Articles 2A to 2I”  
there shall be substituted:  
“Articles 2A to 2J”

E. *Article 2, paragraph 9*

The “and” at the end of subparagraph 9(a)(i) of Article 2 of the Protocol shall be moved to the end of subparagraph 9(a)(ii).

The following subparagraph shall be inserted after subparagraph 9(a)(ii) of Article 2 of the Protocol:

“(iii) Adjustments to the global warming potentials specified in Annexes C and F should be made and, if so, what the adjustments should be;”

In paragraph 9(c) of Article 2 of the Protocol, the following language shall be inserted immediately after the words “In taking such decisions”:

“under subparagraphs 9(a)(i) and (ii)”:

For the final semi-colon of paragraph 9(c) of Article 2 of the Protocol there shall be substituted:

“ In taking such decisions under subparagraph 9(a)(iii), the Parties shall reach agreement by consensus only; ”

F. *Article 2J*

The following Article shall be inserted after Article 2I of the Protocol:

*Article 2J: Hydrofluorocarbons*

1. Each Party shall ensure that for the twelve-month period commencing on 1 January [2014], and in each 12-month period thereafter, its calculated level of consumption of the controlled substances in Annex F does not exceed, annually, [ninety] percent of the average of its calculated levels of consumption in [2004, 2005, and 2006] of Annex F plus Annex C, Group I controlled substances. 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, the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C, Group I controlled substances. 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 the average of its calculated level of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances.

2. Each Party shall ensure that for the twelve-month period commencing on 1 January [2017], and in each 12-month period thereafter, its calculated level of consumption of the controlled substances in Annex F does not exceed, annually, [eighty] per cent of the average of its calculated levels of consumption in [2004, 2005, and 2006] of Annex F plus Annex C Group I controlled substances. 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 the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C, Group I substances. 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 the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances.

3. Each Party shall ensure that for the twelve-month period commencing on 1 January [2020], and in each 12-month period thereafter, its calculated level of consumption of the controlled substances in Annex F does not exceed, annually, [seventy] per cent of the average of its calculated levels of consumption in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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, [seventy] per cent of the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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 the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances.

4. Each Party shall ensure that for the twelve-month period commencing on 1 January [2025], and in each 12-month period thereafter, its calculated level of consumption of the controlled substances in Annex F does not exceed, annually, [fifty] per cent of the average of its calculated levels of consumption in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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, [fifty] per cent of the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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 the average of its calculated levels of production in [2004, 2005 and 2006] of Annex F plus Annex C Group I substances.

5. Each Party shall ensure that for the twelve-month period commencing on 1 January [2029], and in each 12-month period thereafter, its calculated level of consumption of the controlled substances in Annex F does not exceed, annually, [thirty] per cent of the average of its calculated levels of consumption in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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, [thirty] per cent of the average of its

calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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 the average of its calculated levels of production in [2004, 2005 and 2006] of Annex F plus Annex C Group I substances.

6. Each Party shall ensure that for the twelve-month period commencing on 1 January [2033], and in each 12-month period thereafter, its calculated level of consumption of the controlled substances in Annex F does not exceed, annually, [fifteen] per cent of the average of its calculated levels of consumption in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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, [fifteen] per cent of the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances. 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 the average of its calculated levels of production in [2004, 2005, and 2006] of Annex F plus Annex C Group I substances.

7. Each party shall ensure that for the 12-month period commencing on January 1, 2014, and in each 12-month period thereafter, its calculated level of production of Annex F, Group II substances generated as a byproduct of the manufacture of Annex C, Group I substances shall not exceed zero except to the extent that emissions of Annex F, Group II substances from facilities that manufacture Annex C, Group I substances, together with emissions of Annex F, Group II substances from facilities that destroy [more than 2.14 metric tons per year of] Annex F, Group II substances, do not exceed [0.1 percent] of the mass of Annex C, Group I substances manufactured in processes producing Annex F, Group II substances as a byproduct. For purposes of this paragraph, notwithstanding the definition of production in paragraph 5 of Article 1, the calculated level of production of Annex F, Group II substances generated as a byproduct shall include amounts destroyed onsite or at another facility.

8. Each Party shall ensure that any destruction of Annex F, Group II substances generated by facilities that produce Annex C, Group I substances shall occur only by technologies to be approved by the Parties.

*G. Article 3*

The preamble to Article 3 of the Protocol should be replaced with the following:

1. Except as specified in paragraph 2, for the purposes of Articles 2, 2A to 2J and 5, each Party shall, for each group of substances in Annex A, Annex B, Annex C, Annex E or Annex F determine its calculated levels of:

For the period at the end of subparagraph (c) of Article 3 of the Protocol there shall be substituted a semi-colon, and the “and” at the end of subparagraph (b) of Article 3 of the Protocol shall be moved to the end of subparagraph (c).

The following text should be added to the end of Article 3 of the Protocol:

“(d) Emissions of Annex F, Group II substances by adding together all emissions of such substances from facilities that produce Annex C, Group I substances, or from facilities that destroy [more than [2.14][1.69] metric tons of] Annex F, Group II substances per year. For facilities that produce Annex C, Group I substances, emissions shall equal the amount of Annex F, Group II substances generated at the facility, including amounts emitted from equipment leaks, process vents, and thermal oxidizers, but excluding amounts destroyed on site, stored on site, shipped off site for sale, or shipped off site for destruction.”

2. When calculating average levels of production, consumption, imports, and exports of Annex F plus Annex C Group I substances for purposes of Article 2J, each Party shall use the global warming potentials of these substances as specified in Annexes C and F.

*H. Article 4, paragraph 1 sept*

The following paragraph shall be inserted after paragraph 1 *sex* of Article 4 of the Protocol:

“1 *sept.* Within one year of the date of entry into force of this paragraph, each Party shall ban the import of the controlled substances in Annex F from any State not party to this Protocol.”

*I. Article 4, paragraph 2 sept*

The following paragraph shall be inserted after paragraph 2 *sex* of Article 4 of the Protocol:

“2 *sept.* Within one year of the date of entry into force of this paragraph, each Party shall ban the export of the controlled substances in Annex F to any State not party to this Protocol.”

*J. Article 4, paragraphs 5, 6 and 7*

In paragraphs 5, 6 and 7 of Article 4 of the Protocol, for the words:

“Annexes A, B, C and E”  
there shall be substituted:  
“Annexes A, B, C, E and F”

*K. Article 4, paragraph 8*

In paragraph 8 of Article 4 of the Protocol, for the words:

“Articles 2A to 2I”  
there shall be substituted:  
“Articles 2A to 2J”

*L. Article 4B*

The following paragraph shall be inserted after paragraph 2 of Article 4B of the Protocol:

“2 *bis.* Each Party shall, by 1 January 2014 or within three months of the date of entry into force of this paragraph for it, whichever is later, establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances in Annex F. Any Party operating under paragraph 1 of Article 5 that decides it is not in a position to establish and implement such a system by 1 January 2014 may delay taking those actions until 1 January 2016.”

*M. Article 5, paragraph 4*

In paragraph 4 of Article 5 of the Protocol, for the words:

Articles 2A to 2I”  
there shall be substituted:  
“Articles 2A to 2J”

*N. Article 5, paragraphs 5 and 6*

In paragraphs 5 and 6 of Article 5 of the Protocol, for the words:

“Article 2I”  
there shall be substituted:  
“Articles 2I and 2J”

*O. Article 5, paragraph 8 qua*

The following paragraph shall be inserted after paragraph 8 *ter* of Article 5 of the Protocol:

“8 *qua.* Each Party operating under paragraph 1 of this Article shall, in order to meet its basic domestic needs, be entitled to delay its compliance with the control measures set out in paragraph 1 for three years, paragraphs 2 and 4 of Article 2J for four years, in paragraph 3 of Article 2J for five years,

in paragraphs 5 of Article 2J for six years, and in paragraph 6 of Article 2J for ten years, subject to any adjustments made to the control measures in Article 2J in accordance with Article 2(9).”

*P. Article 6*

In Article 6 of the Protocol, for the words:

“Articles 2A to 2I”  
there shall be substituted:  
“Articles 2A to 2J”

*Q. Article 7, paragraphs 2, 3 and 3 ter*

The following line shall be inserted after the line that reads “— in Annex E, for the year 1991,” in paragraph 2 of Article 7 of the Protocol:

“— in Annex F, for the years 2004, 2005, and 2006,”

In paragraphs 2 and 3 of Article 7 of the Protocol, for the words:

“C and E”  
there shall be substituted:  
“C, E and F”

The following paragraph shall be added to Article 7 of the Protocol after paragraph 3 *bis*:

“3 *ter*. Each Party shall provide to the Secretariat statistical data of its annual emissions of Annex F, Group II controlled substances in accordance with Article 3(d) of the Protocol, as well as the amount of Annex F, Group II substances captured and destroyed by technologies to be approved by the Parties.”

*R. Article 10, paragraph 1*

In Article 10, paragraph 1 of the Protocol, for the words:

“Articles 2A to 2E and Article 2I”  
There shall be substituted:  
“Articles 2A to 2E, Article 2I, and Article 2J”

The following shall be inserted at the end of Article 10, paragraph 1 of the Protocol:

“Where a Party operating under paragraph 1 of Article 5 chooses to avail itself of funding from any other financial mechanism that could result in meeting any part of its agreed incremental costs, that part shall not be met by the Financial Mechanism under Article 10 of this Protocol. If a Party has an approved project under the Clean Development Mechanism to control HFC-23 byproduct emissions for a facility of production line, then that facility or production line would not be eligible for support under the Financial Mechanism under Article 10 of this Protocol until the facility or production line is no longer covered by a CDM project.”

*S. Annex C and Annex F*

Annex C, Group I is amended to add the 100-year Global Warming Potential for the following substances:

<b>Substance</b>	<b>100 year Global Warming Potential</b>
HCFC-21	151
HCFC-22	1,810
HCFC-123	77
HCFC-124	609
HCFC-141b	725
HCFC-142b	2,310
HCFC-225ca	122
HCFC-225cb	595

A new Annex F shall be added to the Protocol, following Annex E. It shall read:

**Annex F: Controlled Substances**

<b>Group Substance</b>	<b>100 year Global Warming Potential</b>
<i>Group I</i>	
<i>HFC-32</i>	675
<i>HFC-41</i>	92
<i>HFC-125</i>	3,500
<i>HFC-134</i>	1,100
<i>HFC-134a</i>	1,430
<i>HFC-143</i>	353
<i>HFC-143a</i>	4,470
<i>HFC-152</i>	53
<i>HFC-152a</i>	124
<i>HFC-161</i>	12
<i>HFC-227ea</i>	3,220
<i>HFC-236cb</i>	1,340
<i>HFC-236ea</i>	1,370
<i>HFC-236fa</i>	9,810
<i>HFC-245ca</i>	693
<i>HFC-245fa</i>	1,030
<i>HFC-365mfc</i>	794
<i>HFC-43-10mee</i>	1,640
<i>HFC-1234yf (HFO-1234yf)</i>	4
<i>HFC-1234ze(E) (HFO-1234ze(E))</i>	6
 <i>Group II</i>	
<i>HFC-23</i>	14,800

Article II: Relationship to the 1999 Amendment

No State or regional economic integration organization may deposit an instrument of ratification, acceptance or approval of or accession to this Amendment unless it has previously, or simultaneously, deposited such an instrument to the Amendment adopted at the Eleventh Meeting of the Parties in Beijing, 3 December 1999.

Article III: Relationship to the United Nations Framework Convention on Climate Change and Its Kyoto Protocol

This Amendment is not intended to have the effect of excepting hydrofluorocarbons from the scope of the commitments contained in Articles 4 and 12 of the United Nations Framework Convention on Climate Change and in Articles 2, 5, 7 and 10 of its Kyoto Protocol that apply to “greenhouse gases not controlled by the Montreal Protocol.” Each party to this Amendment shall continue to apply the provisions of the United Nations Framework Convention on Climate Change and its Kyoto Protocol identified above to HFCs as long as those provisions, respectively, remain in force with respect to such party.

Article IV: Entry into force

1. Except as noted in paragraph 2, below, this Amendment shall enter into force on 1 January 2011, provided that at least twenty instruments of ratification, acceptance or approval of the Amendment have been deposited by States or regional economic integration organizations that are Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer. In the event that this condition has not been fulfilled by that date, the Amendment shall enter into force on the ninetieth day following the date on which it has been fulfilled.

2. The changes in Sections H and I of Article I of this Amendment shall enter into force on 1 January 2011, provided that at least seventy instruments of ratification, acceptance or approval of the Amendment have been deposited by States or regional economic integration organizations that are Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer. In the event that this condition has not been fulfilled by that date, the Amendment shall enter into force on the ninetieth day following the date on which it has been fulfilled.

3. For purposes of paragraphs 1 and 2, 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.

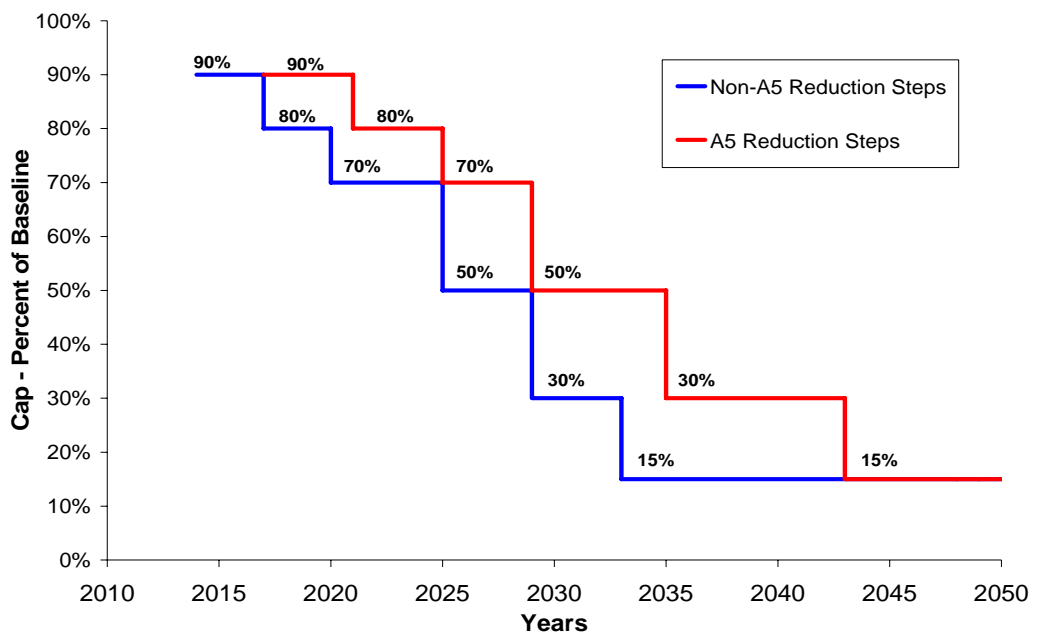
4. After the entry into force of this Amendment, as provided under paragraphs 1 and 2, it shall enter into force for any other Party to the Protocol on the ninetieth day following the date of deposit of its instrument of ratification, acceptance or approval.

**Summary Points: North American HFC Submission to the Montreal Protocol**

The North American proposal includes the following key elements:

- Lists 20 HFCs as a new Annex F, including two substances sometimes referred to as HFOs.
- Recognizes that there may not be alternatives for all HFC applications and therefore utilizes a gradual phasedown mechanism with a plateau, as opposed to a phaseout.
- Establishes provisions for developed country (non-Article 5) and developing country (Article 5) phasedown of production and consumption (see figure below):

**HFC Reduction Steps for Article 5 and Non-Article 5 Countries (% of HCFCs and HFCs Production and Consumption, averaged over 2004 to 2006)**



- Uses weighting by Global Warming Potential for HCFCs and HFCs as compared to typical Montreal Protocol practice of Ozone Depleting Potential.
- Includes provisions to strictly limit HFC-23 byproduct emissions resulting from the production of HCFC-22, beginning in 2014.
- Requires licensing of HFC imports and exports, and bans imports and exports to non-Parties.
- Requires reporting on production and consumption of HFCs, and HFC-23 byproduct emissions.
- Makes eligible for funding under the Montreal Protocol’s Multilateral Fund the phasedown of HFC production and consumption as well as reduction of HFC-23 byproduct emissions.



Cumulative benefits of the HFC phasedown estimated by the U.S. Government amount to reductions of 3,100 million metric tons of carbon dioxide equivalent (MMT CO<sub>2</sub> eq) through 2020, and around 88,000 MMT CO<sub>2</sub> eq through 2050.

Relationship to HCFC phaseout:

- This amendment is designed to be compatible with HCFC phaseout.
- Recognizes that HFCs are alternatives in many existing HCFC applications. Thus, while the reduction steps apply only to HFCs, the baselines account for some level of transition to HFCs by using the average of 2004, 2005, and 2006 HCFC plus HFC consumption and production.
- The suite of known alternative chemicals, new technologies, and improved process/handling practices can significantly reduce HFC consumption while simultaneously supporting the HCFC phaseout.

Relationship with the United Nations Framework Convention on Climate Change (UNFCCC):

- The proposal is intended to support overall global efforts aimed at climate system protection.
  - The proposal constitutes an amendment to the Montreal Protocol, and could be complemented by a related decision by the UNFCCC confirming the Montreal Protocol approach.
  - Leaves unchanged the provisions of the UNFCCC / Kyoto Protocol that govern HFC emissions. Parties could follow Montreal Protocol obligations to meet certain UNFCCC obligations.
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