

## INTRODUCTORY NOTE TO AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEplete THE OZONE LAYER (KIGALI AMENDMENT)

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### Introduction

On October 15, 2016, nearly 200 countries agreed to amend the text of the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol or Protocol), adding additional measures to phase out the use of certain powerful greenhouse gases. The modifications, embodied in what is known as the Kigali Amendment, mark an important step in the progression of climate change mitigation efforts. The ozone protection regime is widely heralded as one of the most successful multilateral environmental systems in place.<sup>1</sup> Working through this established system could provide much-needed stability to climate mitigation efforts and prevent up to 0.5 degrees Celsius of global warming by the end of the century.<sup>2</sup>

### Background

The Montreal Protocol entered into force on August 26, 1989. Reacting to alarming research from the early 1980s that showed a gaping hole in the ozone layer forming over Antarctica, the countries of the world collectively addressed the issue with the Protocol.<sup>3</sup> The advent of the Protocol gave “teeth” to the Vienna Convention for the Protection of the Ozone Layer (Vienna Convention or Convention), which laid out the framework for developing the ozone regime when it entered into force in 1988. By gradually phasing out ozone-depleting substances like chlorofluorocarbons (CFCs), the Montreal Protocol filled in this framework.<sup>4</sup> The obligations under the Protocol were designed to be flexible, thus allowing for a rapid response to new or changing research. This malleable approach helped the Protocol and the Convention become the first UN treaties to achieve universal ratification.

To realize this unprecedented level of success, the drafters also integrated a number of vital provisions into the Protocol’s text.<sup>5</sup> For example, the Protocol uses a financial and technical support program that has helped facilitate this transition in both the developed and developing worlds.<sup>6</sup> Additionally, the Montreal Protocol approaches the issue of compliance with a pragmatic mechanism that aims to get offenders back on track through assistance as opposed to punitive measures.<sup>7</sup> The Protocol also prohibits the trade of substances controlled by the treaty between high contracting parties and states that have yet to ratify the agreement.<sup>8</sup> These provisions collectively provided a number of incentives for states to join the regime and collaborate on reversing the damage that has been done to the ozone layer. Adding to these legal incentives, a shift from opposition to support within the American chemical industry helped spur the Protocol to universal ratification.<sup>9</sup> After the implementation of the Montreal Protocol, scientists observed that the hole in the ozone over the Antarctic has not only stabilized, but also appears to be healing.<sup>10</sup>

Since the auspicious beginning for the ozone regime, it has developed in a number of ways to address new developments as needed, through both adjustments and amendments.<sup>11</sup> Adjustments are implemented through agreements made in meetings of the parties to the Montreal Protocol, while amendments are accomplished through a formal treaty ratification process. The Protocol has been adjusted six times and amended four times—five including the Kigali Amendment.

### The Kigali Amendment

The approach the Kigali Amendment takes to linking the climate and ozone regimes is rather straightforward: it simply adds hydrofluorocarbons (HFCs) to the list of controlled substances under the Montreal Protocol.<sup>12</sup> The agreement plots a gradual 80 to 85 percent phaseout of HFCs by the late 2040s with a staggered implementation of consumption freezes for developed countries (2019), most developing countries (2024), and developing countries that are particularly reliant on air conditioning, like India (2028).<sup>13</sup> The addition is both an effective use of linkage between the regimes and a logical continuation of the ozone regime; HFC use grew as a substitute for the CFCs that

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were gradually phased out of use by the Montreal Protocol.<sup>14</sup> The shift worked to alleviate pressure on the ozone, but ultimately transferred the harm to the climate, thus necessitating the Kigali Amendment.

As noted previously, the Montreal Protocol can be modified by either adjustment or amendment. These two approaches have different requirements and implications. By amending the agreement to integrate climate change mitigation with the Kigali Amendment, the parties necessitated ratification.<sup>15</sup> While this prospect was likely not as daunting on the date on which it was agreed, there are now clear challenges to ratification by the United States in light of the incoming administration's expressed views toward climate change mitigation and a congress that is generally hostile to international agreements of any variety.<sup>16</sup> Subsequently, other countries would have to adjust their calculus for adopting the new, more stringent standards with the United States—as one of the main polluters—not participating. Had the parties to the Montreal Protocol proceeded with an adjustment to the Protocol instead of an amendment, the predicament would be similar. While the United Nations Environment Programme (UNEP) maintains that adjustments are automatically applicable to the member states,<sup>17</sup> the D.C. Circuit Court of Appeals held otherwise in *Natural Resource Defense Council, Inc. v. Environmental Protection Agency*.<sup>18</sup> The court maintained that allowing adjustments to hold the force of law in the United States “would raise serious constitutional questions in light of the nondelegation doctrine, numerous constitutional procedural requirements for making law, and the separation of powers.”<sup>19</sup> The U.S. Supreme Court denied certiorari and no U.S. court has addressed the matter since. This has not stopped the Environmental Protection Agency (EPA) from implementing the adjustments of its own volition, though.<sup>20</sup> With the views toward climate change expressed by the incoming administration and the appointment of Scott Pruitt to lead the EPA,<sup>21</sup> the continuation of such a policy is likely at risk.

Subsequently, while the agreement of the parties to amend the Montreal Protocol with the Kigali Amendment is a significant achievement for climate change mitigation, its success is not guaranteed. The Kigali Amendment will enter into force at the international level on January 1, 2019, as long as at least twenty parties have ratified it—otherwise it will enter into force ninety days after it reaches this threshold of ratification.<sup>22</sup> Success will ultimately hinge on the major emitters ratifying the agreement, though; without these countries, the impact of the Amendment will be minimal. While the United States is one such emitter, the agreement could still succeed to a lesser degree without its backing. In the recent climate change conference of the parties in Marrakesh, the participants seemed to indicate that the climate change mitigation regime would continue forward with or without U.S. support.<sup>23</sup>

## Conclusion

Ultimately, the Kigali Amendment is a pragmatic approach to alleviate global warming and presents great promise for the future of international climate change mitigation efforts. While the successful implementation of the Amendment on a universal scale is less than certain, supporters of the agreement remain hopeful that the progress achieved in recent years will not regress in the wake of shifting views from the White House.

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## ENDNOTES

- 1 *What's Next for the Kigali Deal to Curb Potent Greenhouse Gases?*, UNEP NEWS CENTER (Oct. 20, 2016), at <http://www.unep.org/newscentre/Default.aspx?DocumentID=27086&ArticleID=36286&l=en> [hereinafter *Future of Kigali*].
- 2 *Countries Agree to Curb Powerful Greenhouse Gases in Largest Climate Breakthrough Since Paris*, UNEP NEWS CENTER (Oct. 15, 2016), at <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=27086&ArticleID=36283&l=en>.
- 3 *The Environmental Movement's Greatest Success Story: Ozone Layer Begins to Heal*, UNEP, at <http://www.unep.org/stories/Climate/Ozone-Layer-Begins-to-Heal.asp> (last visited Jan. 15, 2017).
- 4 Edith Brown Weiss, *Introductory Note to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer*, UNITED NATIONS AUDIOVISUAL LIBRARY OF INTERNATIONAL LAW, at <http://legal.un.org/avl/ha/vcpol/vcpol.html> (last visited Jan. 15, 2017).
- 5 *Future of Kigali*, *supra* note 1.
- 6 *Id.*
- 7 *Id.*

- 8 *Id.*
- 9 Cass R. Sunstein, *Montreal vs. Kyoto: A Tale of Two Protocols* 12 (John M. Olin Law & Economics, Working Paper No. 302 (2D Series), 2006), at <http://www.law.uchicago.edu/files/files/302.pdf>.
- 10 *Watching the Ozone Hole Before and After the Montreal Protocol*, NASA EARTH OBSERVATORY (Sept. 18, 2012), at <http://earthobservatory.nasa.gov/IOTD/view.php?id=79198>; Susan Solomon et al., *Emergence of Healing in the Antarctic Ozone Layer*, 353 *SCIENCE* 269–74 (June 30, 2016).
- 11 *Handbook for The Montreal Protocol on Substances that Deplete the Ozone Layer*, UNEP OZONE SECRETARIAT, at <http://ozone.unep.org/en/treaties-decisions/montreal-protocol-substances-deplete-ozone-layer> (last visited Jan. 15, 2017) [hereinafter *Handbook for the Montreal Protocol*].
- 12 *Future of Kigali*, *supra* note 1.
- 13 *Id.*
- 14 *Id.*
- 15 Montreal Protocol Art. 9(5), 1522 UNTS 3; 26 ILM 1550 (1987). While the EPA arguably has the authority to implement the Amendment without the advice and consent of the Senate under 42 U.S.C. § 7671n, there is a precedent of submitting amendments to the Montreal Protocol to the Senate for approval, and the current or incoming administration is likely to follow that precedent. See James Losey, *Phase-Down of HFCs Depends on Trump Administration*, LAW 360 (Nov. 30, 2016), at <https://www.law360.com/foodbeverage/articles/867333/phase-down-of-hfcs-depends-on-trump-administration>.
- 16 See generally Coral Davenport, *Donald Trump Could Put Climate Change on Course for 'Danger Zone'*, N.Y. TIMES, Nov. 10, 2016, at A1.
- 17 *Handbook for the Montreal Protocol*, *supra* note 11.
- 18 *Natural Resources Defense Council v. Environmental Protection Agency*, 464 F.3d 1, 4 (D.C. Cir. 2006).
- 19 John H. Knox, *International Decisions: Natural Resource Defense Council v. Environmental Protection Agency*, 464 F.3d 1. *United States Court of Appeals for the District of Columbia Circuit*, August 29, 2006, 101 AJIL 471, 474 (2007).
- 20 Lecture by Suzanne Rubini, Chief, Legal Office, EPA, in Athens, GA (Apr. 4, 2014) (notes on file with author).
- 21 Coral Davenport and Eric Lipton, *Trump Picks Scott Pruitt, Climate Change Denialist, to Lead E.P.A.*, N.Y. TIMES, Dec. 7, 2016, at A1.
- 22 Kigali Amendment to the Montreal Protocol Art IV(1), Oct. 15, 2016, at <https://treaties.un.org/doc/Publication/CN/2016/CN.872.2016-Eng.pdf>. This entry into force provision allows the regime to escape the unfortunate fate of the Kyoto Protocol, which could only enter into force if ratifications covered 55 percent of emissions from Annex I countries. When the United States failed to ratify the agreement, the Kyoto Protocol could only enter into force with the support of Russia. Russia did ratify the agreement, but it did so without taking on any emission reduction obligations, ultimately leaving the Kyoto Protocol in a state of impotence.
- 23 Daniel Bodansky, *Marrakech Express—Going Slow but Still on Track*, OPINIO JURIS (Dec. 9, 2016), at <http://opiniojuris.org/2016/12/09/marrakech-express-going-slow-but-still-on-track/>.

AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEplete THE OZONE  
LAYER (KIGALI AMENDMENT)\*  
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**Decision XXVIII/1: Further Amendment of the Montreal Protocol**

To adopt, in accordance with the procedure laid down in paragraph 4 of Article 9 of the Vienna Convention for the Protection of the Ozone Layer, the Amendment to the Montreal Protocol set out in annex I to the report of the Twenty-Eighth Meeting of the Parties;

**Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer**

**Article I: Amendment**

*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”

*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”

*Article 2, paragraphs 8 (a), 9(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”

The following words shall be added at the end of subparagraph (a) of paragraph 8 of Article 2 of the Protocol:

“Any such agreement may be extended to include obligations respecting consumption or production under Article 2J provided that the total combined calculated level of consumption or production of the Parties concerned does not exceed the levels required by Article 2J.”

In subparagraph (a) (i) of paragraph 9 of Article 2 of the Protocol, after the second use of the words:

“should be;”

there shall be deleted:

“and”

\* This text was reproduced and reformatted from the text available at the United Nations Environment Program website (visited Jan. 15, 2017), [http://conf.montreal-protocol.org/meeting/mop/mop-28/final-report/English/Kigali\\_Amendment-English.pdf](http://conf.montreal-protocol.org/meeting/mop/mop-28/final-report/English/Kigali_Amendment-English.pdf).

Subparagraph (a) (ii) of paragraph 9 of Article 2 of the Protocol shall be renumbered as subparagraph (a) (iii).

The following shall be added as subparagraph (a) (ii) after subparagraph (a) (i) of paragraph 9 of Article 2 of the Protocol:

“Adjustments to the global warming potentials specified in Group I of Annex A, Annex C and Annex F should be made and, if so, what the adjustments should be; and”

#### *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 2019, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Annex F, expressed in CO<sub>2</sub> equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of consumption of Annex F controlled substances for the years 2011, 2012 and 2013, plus fifteen per cent of its calculated level of consumption of Annex C, Group I, controlled substances as set out in paragraph 1 of Article 2F, expressed in CO<sub>2</sub> equivalents:
  - (a) 2019 to 2023: 90 per cent
  - (b) 2024 to 2028: 60 per cent
  - (c) 2029 to 2033: 30 per cent
  - (d) 2034 to 2035: 20 per cent
  - (e) 2036 and thereafter: 15 per cent
2. Notwithstanding paragraph 1 of this Article, the Parties may decide that a 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 Annex F, expressed in CO<sub>2</sub> equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of consumption of Annex F controlled substances for the years 2011, 2012 and 2013, plus twenty-five per cent of its calculated level of consumption of Annex C, Group I, controlled substances as set out in paragraph 1 of Article 2F, expressed in CO<sub>2</sub> equivalents:
  - (a) 2020 to 2024: 95 per cent
  - (b) 2025 to 2028: 65 per cent
  - (c) 2029 to 2033: 30 per cent
  - (d) 2034 to 2035: 20 per cent
  - (e) 2036 and thereafter: 15 per cent
3. Each Party producing the controlled substances in Annex F shall ensure that for the twelve-month period commencing on 1 January 2019, and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Annex F, expressed in CO<sub>2</sub> equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of production of Annex F controlled substances for the years 2011, 2012 and 2013, plus fifteen per cent of its calculated level of production

of Annex C, Group I, controlled substances as set out in paragraph 2 of Article 2F, expressed in CO<sub>2</sub> equivalents:

- (a) 2019 to 2023: 90 per cent
  - (b) 2024 to 2028: 60 per cent
  - (c) 2029 to 2033: 30 per cent
  - (d) 2034 to 2035: 20 per cent
  - (e) 2036 and thereafter: 15 per cent
4. Notwithstanding paragraph 3 of this Article, the Parties may decide that a Party producing the controlled substances in Annex F shall ensure that for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Annex F, expressed in CO<sub>2</sub> equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of production of Annex F controlled substances for the years 2011, 2012 and 2013, plus twenty-five per cent of its calculated level of production of Annex C, Group I, controlled substances as set out in paragraph 2 of Article 2F, expressed in CO<sub>2</sub> equivalents:
- (a) 2020 to 2024: 95 per cent
  - (b) 2025 to 2028: 65 per cent
  - (c) 2029 to 2033: 30 per cent
  - (d) 2034 to 2035: 20 per cent
  - (e) 2036 and thereafter: 15 per cent
5. Paragraphs 1 to 4 of this Article 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 the Parties to be exempted uses.
6. Each Party manufacturing Annex C, Group I, or Annex F substances shall ensure that for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its emissions of Annex F, Group II, substances generated in each production facility that manufactures Annex C, Group I, or Annex F substances are destroyed to the extent practicable using technology approved by the Parties in the same twelve-month period.
7. Each Party shall ensure that any destruction of Annex F, Group II, substances generated by facilities that produce Annex C, Group I, or Annex F substances shall occur only by technologies approved by the Parties.

### *Article 3*

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

“1. 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 final semi-colon of subparagraph (a) (i) of Article 3 of the Protocol there shall be substituted:

“, except as otherwise specified in paragraph 2;”

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

“; and

(d) Emissions of Annex F, Group II, substances generated in each facility that generates Annex C, Group I, or Annex F substances by including, among other things, amounts emitted from equipment leaks, process vents and destruction devices, but excluding amounts captured for use, destruction or storage.

2. When calculating levels, expressed in CO<sub>2</sub> equivalents, of production, consumption, imports, exports and emissions of Annex F and Annex C, Group I, substances for the purposes of Article 2J, paragraph 5 *bis* of Article 2 and paragraph 1 (d) of Article 3, each Party shall use the global warming potentials of those substances specified in Group I of Annex A, Annex C and Annex F.”

*Article 4, paragraph 1 sept*

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

“1 *sept*. Upon 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.”

*Article 4, paragraph 2 sept*

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

“2 *sept*. Upon 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.”

*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”

*Article 4, paragraphs 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”

*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 2019 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 2019 may delay taking those actions until 1 January 2021.”

*Article 5*

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

“2I”

there shall be substituted:

“2J”

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

“Article 2I”

there shall be substituted:

“Articles 2I and 2J”

In paragraph 5 of Article 5 of the Protocol, before the words:

“any control measures”

there shall be inserted:

“with”

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

“8 *qua*

(a) Each Party operating under paragraph 1 of this Article, subject to any adjustments made to the control measures in Article 2J in accordance with paragraph 9 of Article 2, shall be entitled to delay its compliance with the control measures set out in subparagraphs (a) to (e) of paragraph 1 of Article 2J and subparagraphs (a) to (e) of paragraph 3 of Article 2J and modify those measures as follows:

- (i) 2024 to 2028: 100 per cent
- (ii) 2029 to 2034: 90 per cent
- (iii) 2035 to 2039: 70 per cent
- (iv) 2040 to 2044: 50 per cent
- (v) 2045 and thereafter: 20 per cent

(b) Notwithstanding subparagraph (a) above, the Parties may decide that a Party operating under paragraph 1 of this Article, subject to any adjustments made to the control measures in Article 2J in accordance with paragraph 9 of Article 2, shall be entitled to delay its compliance with the control measures set out in subparagraphs (a) to (e) of paragraph 1 of Article 2J and subparagraphs (a) to (e) of paragraph 3 of Article 2J and modify those measures as follows:

- (i) 2028 to 2031: 100 per cent
- (ii) 2032 to 2036: 90 per cent
- (iii) 2037 to 2041: 80 per cent
- (iv) 2042 to 2046: 70 per cent
- (v) 2047 and thereafter: 15 per cent

(c) Each Party operating under paragraph 1 of this Article, for the purposes of calculating its consumption baseline under Article 2J, shall be entitled to use the average of its calculated levels of consumption of Annex F controlled substances for the years 2020, 2021 and 2022, plus sixty-five per cent of its baseline consumption of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(d) Notwithstanding subparagraph (c) above, the Parties may decide that a Party operating under paragraph 1 of this Article, for the purposes of calculating its consumption baseline under Article 2J, shall be entitled to use the average of its calculated levels of consumption of Annex F controlled substances for the years 2024, 2025 and 2026, plus sixty-five per cent of



its baseline consumption of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(e) Each Party operating under paragraph 1 of this Article and producing the controlled substances in Annex F, for the purposes of calculating its production baseline under Article 2J, shall be entitled to use the average of its calculated levels of production of Annex F controlled substances for the years 2020, 2021 and 2022, plus sixty-five per cent of its baseline production of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(f) Notwithstanding subparagraph (e) above, the Parties may decide that a Party operating under paragraph 1 of this Article and producing the controlled substances in Annex F, for the purposes of calculating its production baseline under Article 2J, shall be entitled to use the average of its calculated levels of production of Annex F controlled substances for the years 2024, 2025 and 2026, plus sixty-five per cent of its baseline production of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(g) Subparagraphs (a) to (f) of this paragraph will apply to calculated levels of production and consumption save to the extent that a high-ambient-temperature exemption applies based on criteria decided by the Parties.”

#### *Article 6*

In Article 6 of the Protocol, for the words:

“Articles 2A to 2I”

there shall be substituted:

“Articles 2A to 2J”

#### *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 2011 to 2013, except that Parties operating under paragraph 1 of Article 5 shall provide such data for the years 2020 to 2022, but those Parties operating under paragraph 1 of Article 5 to which subparagraphs (d) and (f) of paragraph 8 *qua* of Article 5 applies shall provide such data for the years 2024 to 2026;”

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 on its annual emissions of Annex F, Group II, controlled substances per facility in accordance with paragraph 1 (d) of Article 3 of the Protocol.”

#### *Article 7, paragraph 4*

In paragraph 4 of Article 7, after the words:

“statistical data on” and “provides data on”

there shall be added:

“production,”

*Article 10, paragraph 1*

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

“and Article 2I”

There shall be substituted:

“, Article 2I and Article 2J”

The following shall be inserted at the end of paragraph 1 of Article 10 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.”

*Article 17*

In Article 17 of the Protocol, for the words:

“Articles 2A to 2I”

there shall be substituted:

“Articles 2A to 2J”

*Annex A*

The following table shall replace the table for Group I in Annex A to the Protocol:

| Group   | Substance | Ozone-Depleting Potential* | 100-Year Global Warming Potential |
|---|-----------|----------------------------|-----------------------------------|
| <i>Group I</i>                                |           |                            |                                   |
| CFCl <sub>3</sub>                             | (CFC-11)  | 1.0                        | 4 750                             |
| CF <sub>2</sub> Cl <sub>2</sub>               | (CFC-12)  | 1.0                        | 10 900                            |
| C <sub>2</sub> F <sub>3</sub> Cl <sub>3</sub> | (CFC-113) | 0.8                        | 6 130                             |
| C <sub>2</sub> F <sub>4</sub> Cl <sub>2</sub> | (CFC-114) | 1.0                        | 10 000                            |
| C <sub>2</sub> F <sub>5</sub> Cl              | (CFC-115) | 0.6                        | 7 370                             |

*Annex C and Annex F*

The following table shall replace the table for Group I in Annex C to the Protocol:

| Group          | Substance  | Number of isomers | Ozone-Depleting Potential* | 100-Year Global Warming Potential*** |      |
|----------------|--|-------------------|----------------------------|--------------------------------------|------|
| <i>Group I</i> |  |                   |                            |                                      |      |
|                | CHFC1 <sub>2</sub>   | (HCFC-21)**       | 1                          | 0.04                                 | 151  |
|                | CHF <sub>2</sub> Cl  | (HCFC-22)**       | 1                          | 0.055                                | 1810 |
|                | CH <sub>2</sub> FCl  | (HCFC-31)         | 1                          | 0.02                                 |      |
|                | C <sub>2</sub> HFCl <sub>4</sub>                             | (HCFC-121)        | 2                          | 0.01–0.04                            |      |
|                | C <sub>2</sub> HF <sub>2</sub> Cl <sub>3</sub>               | (HCFC-122)        | 3                          | 0.02–0.08                            |      |
|                | C <sub>2</sub> HF <sub>3</sub> Cl <sub>2</sub>               | (HCFC-123)        | 3                          | 0.02–0.06                            | 77   |
|                | CHCl <sub>2</sub> CF <sub>3</sub>                            | (HCFC-123)**      | –                          | 0.02                                 |      |
|                | C <sub>2</sub> HF <sub>4</sub> Cl                            | (HCFC-124)        | 2                          | 0.02–0.04                            | 609  |
|                | CHFClCF <sub>3</sub>   | (HCFC-124)**      | –                          | 0.022                                |      |
|                | C <sub>2</sub> H <sub>2</sub> FCl <sub>3</sub>               | (HCFC-131)        | 3                          | 0.007–0.05                           |      |
|                | C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Cl <sub>2</sub> | (HCFC-132)        | 4                          | 0.008–0.05                           |      |
|                | C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Cl              | (HCFC-133)        | 3                          | 0.02–0.06                            |      |
|                | C <sub>2</sub> H <sub>3</sub> FCl <sub>2</sub>               | (HCFC-141)        | 3                          | 0.005–0.07                           |      |
|                | CH <sub>3</sub> CFCl <sub>2</sub>                            | (HCFC-141b)**     | –                          | 0.11                                 | 725  |
|                | C <sub>2</sub> H <sub>3</sub> F <sub>2</sub> Cl              | (HCFC-142)        | 3                          | 0.008–0.07                           |      |
|                | CH <sub>3</sub> CF <sub>2</sub> Cl                           | (HCFC-142b)**     | –                          | 0.065                                | 2310 |
|                | C <sub>2</sub> H <sub>4</sub> FCl                            | (HCFC-151)        | 2                          | 0.003–0.005                          |      |
|                | C <sub>3</sub> HFCl <sub>6</sub>                             | (HCFC-221)        | 5                          | 0.015–0.07                           |      |
|                | C <sub>3</sub> HF <sub>2</sub> Cl <sub>5</sub>               | (HCFC-222)        | 9                          | 0.01–0.09                            |      |
|                | C <sub>3</sub> HF <sub>3</sub> Cl <sub>4</sub>               | (HCFC-223)        | 12                         | 0.01–0.08                            |      |
|                | C <sub>3</sub> HF <sub>4</sub> Cl <sub>3</sub>               | (HCFC-224)        | 12                         | 0.01–0.09                            |      |
|                | C <sub>3</sub> HF <sub>5</sub> Cl <sub>2</sub>               | (HCFC-225)        | 9                          | 0.02–0.07                            |      |
|                | CF <sub>3</sub> CF <sub>2</sub> CHCl <sub>2</sub>            | (HCFC-225ca)**    | –                          | 0.025                                | 122  |
|                | CF <sub>2</sub> ClCF <sub>2</sub> CHClF                      | (HCFC-225cb)**    | –                          | 0.033                                | 595  |
|                | C <sub>3</sub> HF <sub>6</sub> Cl                            | (HCFC-226)        | 5                          | 0.02–0.10                            |      |
|                | C <sub>3</sub> H <sub>2</sub> FCl <sub>5</sub>               | (HCFC-231)        | 9                          | 0.05–0.09                            |      |
|                | C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> Cl <sub>4</sub> | (HCFC-232)        | 16                         | 0.008–0.10                           |      |
|                | C <sub>3</sub> H <sub>2</sub> F <sub>3</sub> Cl <sub>3</sub> | (HCFC-233)        | 18                         | 0.007–0.23                           |      |
|                | C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> Cl <sub>2</sub> | (HCFC-234)        | 16                         | 0.01–0.28                            |      |
|                | C <sub>3</sub> H <sub>2</sub> F <sub>5</sub> Cl              | (HCFC-235)        | 9                          | 0.03–0.52                            |      |
|                | C <sub>3</sub> H <sub>3</sub> FCl <sub>4</sub>               | (HCFC-241)        | 12                         | 0.004–0.09                           |      |
|                | C <sub>3</sub> H <sub>3</sub> F <sub>2</sub> Cl <sub>3</sub> | (HCFC-242)        | 18                         | 0.005–0.13                           |      |
|                | C <sub>3</sub> H <sub>3</sub> F <sub>3</sub> Cl <sub>2</sub> | (HCFC-243)        | 18                         | 0.007–0.12                           |      |
|                | C <sub>3</sub> H <sub>3</sub> F <sub>4</sub> Cl              | (HCFC-244)        | 12                         | 0.009–0.14                           |      |
|                | C <sub>3</sub> H <sub>4</sub> FCl <sub>3</sub>               | (HCFC-251)        | 12                         | 0.001–0.01                           |      |
|                | C <sub>3</sub> H <sub>4</sub> F <sub>2</sub> Cl <sub>2</sub> | (HCFC-252)        | 16                         | 0.005–0.04                           |      |
|                | C <sub>3</sub> H <sub>4</sub> F <sub>3</sub> Cl              | (HCFC-253)        | 12                         | 0.003–0.03                           |      |
|                | C <sub>3</sub> H <sub>5</sub> FCl <sub>2</sub>               | (HCFC-261)        | 9                          | 0.002–0.02                           |      |
|                | C <sub>3</sub> H <sub>5</sub> F <sub>2</sub> Cl              | (HCFC-262)        | 9                          | 0.002–0.02                           |      |
|                | C <sub>3</sub> H <sub>6</sub> FCl                            | (HCFC-271)        | 5                          | 0.001–0.03                           |      |

\* 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.

\*\*\* For substances for which no GWP is indicated, the default value 0 applies until a GWP value is included by means of the procedure foreseen in paragraph 9 (a) (ii) of Article 2.

The following annex shall be added to the Protocol after Annex E:

“Annex F: Controlled substances

| Group           | Substance    | 100-Year Global Warming Potential |
|-----------------|--------------|-----------------------------------|
| <i>Group I</i>  |              |                                   |
|                 | HFC-134      | 1 100                             |
|                 | HFC-134a     | 1 430                             |
|                 | HFC-143      | 353                               |
|                 | HFC-245fa    | 1 030                             |
|                 | HFC-365mfc   | 794                               |
|                 | HFC-227ea    | 3 220                             |
|                 | HFC-236cb    | 1 340                             |
|                 | HFC-236ea    | 1 370                             |
|                 | HFC-236fa    | 9 810                             |
|                 | HFC-245ca    | 693                               |
|                 | HFC-43-10mee | 1 640                             |
|                 | HFC-32       | 675                               |
|                 | HFC-125      | 3 500                             |
|                 | HFC-143a     | 4 470                             |
|                 | HFC-41       | 92                                |
|                 | HFC-152      | 53                                |
|                 | HFC-152a     | 124                               |
| <i>Group II</i> |              |                                   |
|                 | HFC-23       | 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 or in Articles 2, 5, 7 and 10 of its Kyoto Protocol.

## Article IV: Entry into force

1. Except as noted in paragraph 2, below, this Amendment shall enter into force on 1 January 2019, 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 to Article 4 of the Protocol, Control of trade with non-Parties, set out in Article I of this Amendment shall enter into force on 1 January 2033, 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.

#### **Article V: Provisional application**

Any Party may, at any time before this Amendment enters into force for it, declare that it will apply provisionally any of the control measures set out in Article 2J, and the corresponding reporting obligations in Article 7, pending such entry into force.