

KIGALI AMENDMENT TO THE MONTREAL PROTOCOL:

A Crucial Step in the Fight Against Catastrophic Climate Change

In October 2016, the 28th Meeting of the Parties to the Montreal Protocol adopted the Kigali Amendment on hydrofluorocarbons (HFCs), which commits the world's nations to significantly reduce consumption and production of HFCs.¹ The Kigali Amendment, which could avoid emissions of well over 70 billion tonnes carbon dioxide-equivalent (CO₂e) by 2050, marks an historic achievement and brings significant impetus to the Paris Agreement which comes into force this month.



MONTREAL PROTOCOL AND HFCs

The Montreal Protocol is widely hailed as the most successful environmental agreement to date, phasing out 98 per cent of ozone-depleting substances (ODS) and putting the ozone layer on the path to recovery by the middle of this century.

Since most ODS such as hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) are also powerful greenhouse gases (GHGs), the Montreal Protocol has avoided more than 135 billion tonnes CO₂e emissions through phasing out their production and consumption.² Under the Montreal Protocol, Parties have historically achieved close to 100 per cent compliance rates, with many meeting their targets well ahead of reduction schedules. HFCs are man-made, highly potent GHGs used as replacements for ODS in refrigeration and air-conditioning equipment. Natural climate-friendly alternatives such as CO₂, ammonia and hydrocarbons which do not damage the climate are commercially available and rapidly gaining market share.

HFC PHASE-DOWN SCHEDULE UNDER KIGALI AMENDMENT

The Kigali Amendment, which enters into force on January 1, 2019, will significantly contribute to the goals contained in Article 2 of the Paris Agreement “to pursue efforts to limit the [average global] temperature increase to 1.5° Celsius” as well as directly supporting Decision 1/CP.21 seeking to enhance near-term mitigation.³

All countries have committed to legally binding targets which mandate gradual reductions in HFC consumption and production, starting in 2019 for developed countries

and 2024 for developing countries. The HFC reductions are measured on the basis of overall CO₂e impact as HFCs have widely differing Global Warming Potentials (GWP), ranging from 53 to 14,800.⁴ The agreement includes two phase-down options for developing countries (Article 5 or A5 Parties) and an earlier phase-down schedule for developed countries (non-Article 5 or non-A5 Parties).

While the majority of non-A5 parties will begin phasing down HFC consumption with a 10 per cent reduction in 2019, a small group of non-A5 countries (Belarus, Kazakhstan, Russian Federation, Tajikistan and Uzbekistan) are able to slightly delay the first two steps of the phase-down, starting in 2020 with a five per cent reduction. The majority of A5 parties will freeze HFC growth in 2024 based on 2020-22 levels and achieve a 10 per cent reduction in 2029. A second group of A5 parties will freeze HFC growth in 2028, based on 2024-26 levels, and achieve the first reduction step in 2032. This second group comprises 10 countries: Bahrain, India, Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates.

Based on the current agreement, HFC consumption will reach a plateau of 15 per cent of the baseline in 2036 for developed countries, in 2047 for countries in Group 2 and a plateau of 20 per cent in 2045 for countries in Group 1. Despite the differentiated baselines and reduction steps, with some countries making slower reductions, the bulk of HFC consumption and production in developing countries will be reduced under the earlier schedule. China, by far the largest consumer and producer, together with significant HFC-consuming countries such as Brazil, Argentina, South Korea, Mexico, Indonesia, Malaysia and Thailand, have all opted for the earlier schedule (Group 1).

TABLE 1. HFC phase-down schedule under Kigali Amendment⁵

	Non-A5 (developed countries)	A5 (developing countries) Group 1	A5 (developing countries) Group 2
Baseline HFC component	2011-2013 (average consumption)	2020-2022 (average consumption)	2024-2026 (average consumption)
Baseline HCFC component	15% of baseline	65% of baseline	65% of baseline
Freeze	-	2024	2028
1st step	2019 - 10%	2029 - 10%	2032 - 10%
2nd step	2024 - 40%	2035 - 30%	2037 - 20%
3rd step	2029 - 70%	2040 - 50%	2042 - 30%
4th step	2034 - 80%	-	-
Plateau	2036 - 85%	2045 - 80%	2047 - 85%
Notes	Belarus, Russian Federation, Kazakhstan, Tajikistan, Uzbekistan, 25% HCFC component and 1st two steps are later: 5% in 2020, 35% in 2025	Article 5 countries not part of Group 2	GCC (Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Bahrain, Oman), India, Iran, Iraq, Pakistan

KIGALI AMENDMENT RELATIONSHIP TO UNFCCC

• Legal relationship

Article III of the Kigali Amendment clarifies its legal relationship with the UNFCCC noting that the amendment will not have the effect of excepting HFCs from the scope of the commitments contained in Articles 4 and 12 of the UNFCCC.⁶ HFC consumption and production will be controlled under the Montreal Protocol while HFC emissions will continue to be reported under the UNFCCC.

• Differentiation

The concept of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC) is operationalised in the Montreal Protocol as developed countries begin phasing down HFCs in advance of developing countries and also provide financial support for A5 Parties to comply with their obligations. The HFC phase-down schedule allows for different reduction schedules and baseline calculations even within the A5 and non-A5 groups, which is unprecedented. Further flexibilities are prescribed in Decision XXVIII/2 allowing developing countries to define sectors, select technologies and alternatives, elaborate and implement strategies to meet agreed HFC obligations based on specific needs and national circumstances.⁷

ADDITIONAL CLIMATE BENEFITS AVAILABLE

The Kigali Amendment is poised to avoid more than 70 billion tonnes CO_{2e} HFC emissions by 2050 compared to business as usual scenario. However, additional climate benefits – beyond what is now enshrined in the phase-down schedule – can be achieved through early HFC-23 by-product destruction, improving energy efficiency, providing additional financial incentives, removing barriers to HFC-alternatives and strengthening the control measures over time.

• HFC-23 by-product destruction

HFC-23 (trifluoromethane), a by-product in the manufacture of HCFC-22 (an ODS used as a refrigerant and a feedstock for production of other chemicals), is a potent GHG with a GWP of 14,800.⁸ The Kigali Amendment mandates all HCFC-22 producing facilities to collect and destroy HFC-23 by-product from 2020 to the extent practicable.⁹ Additional emission reductions can be gained by taking earlier action, which should be feasible for most developing countries as many companies set up destruction facilities under the Clean Development Mechanism (CDM).

• Energy efficiency gains

Incentivising energy efficiency improvements alongside refrigerant transition could significantly increase the climate benefit from the Kigali Amendment.¹⁰ An increase in energy efficiency will also reduce operating costs and stress on energy grids which would grow significantly as the world moves towards installing 1.6 billion air-conditioning units by 2050.¹¹

While the primary purpose of the Montreal Protocol will be the phase-out of ODS and HFCs, the need to maintain or enhance energy efficiency is explicitly recognised in the Amendment agreement.¹² Parties will also be exploring ways to enhance the energy efficiency of cooling equipment under Decision XXVIII/3 which requests the Montreal Protocol's Technology and Economic Assessment Panel (TEAP) to review energy efficiency opportunities in the refrigeration, air-conditioning and heat pump sectors.¹³

• Additional financial incentives

An early phase-down of HFCs under the Montreal Protocol is one of the most cost-effective mitigation options available today. The Multilateral Fund is the financial mechanism of the Montreal Protocol which supports the implementation of developing country commitments, ensuring sufficient funding is channelled for technological transfer including industrial conversion, technical assistance, training and other capacity-building activities.

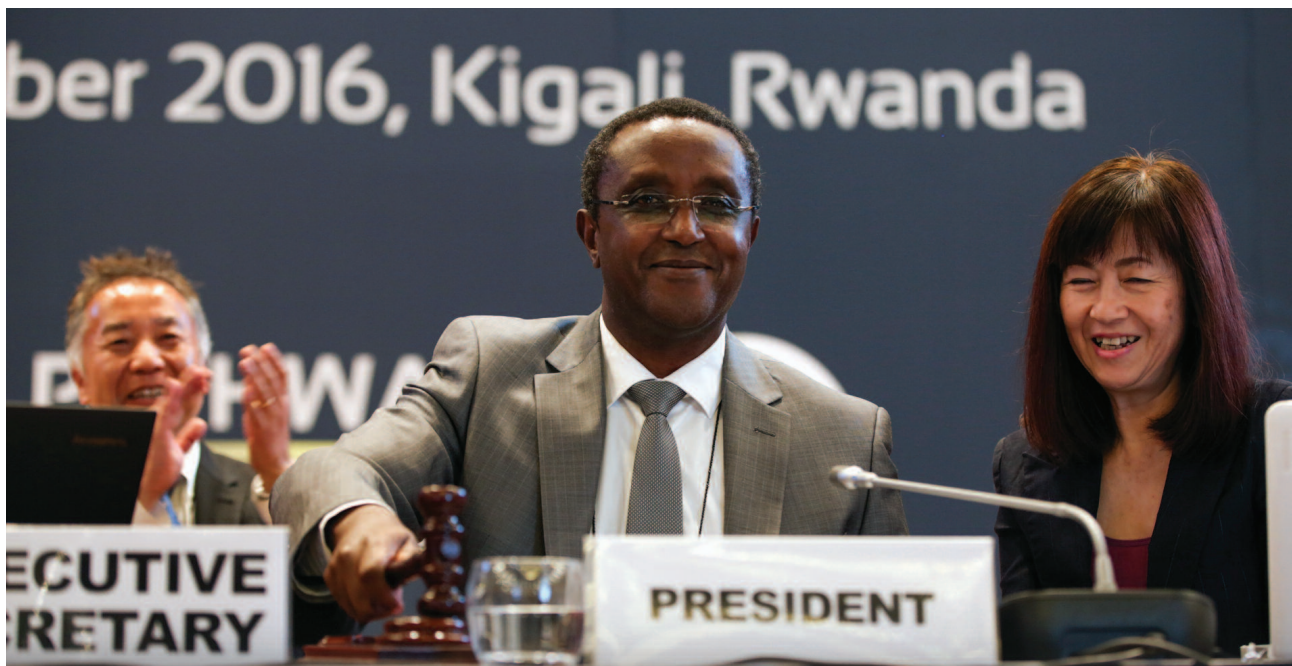
In the past, the success of the Montreal Protocol in implementing ODS phase-outs has been contingent on funding capacity-building activities through a network of ozone officers throughout developing countries. This capacity needs to be strengthened in order to deal with the increasingly complex situation resulting from the introduction of low-GWP alternatives that are flammable or present other manageable safety concerns and to address issues such as growing stockpiles of unwanted ODS, HFCs and equipment. Supporting additional financial incentives to developing countries to undertake faster and more effective implementation would increase the climate benefits under the HFC phase-down.

• Removing barriers to the adoption of climate-friendly technologies

The Kigali Amendment provides a strong market signal that will accelerate innovation and technology development for climate-friendly refrigeration technologies, conditions which will likely trigger a more rapid HFC phase-down than currently prescribed under the amendment. Some HFC-free technologies face barriers to widespread uptake due to restrictive industry standards, in particular for flammable refrigerants.¹⁴ This is explicit in a Decision accompanying the Kigali Amendment which aims to support the timely revision of relevant standards and inter alia establishes a TEAP task force on standards.¹⁵ Industries and governments can contribute to this process by providing experts to this initiative.

• Accelerating the HFC phase-down schedule through future adjustments

An adjustment provision enables the Montreal Protocol to respond quickly to the need to accelerate existing agreements under the Protocol. Since its adoption, there have been six adjustments to the Montreal Protocol, most recently in 2007 when the HCFC phase-out was accelerated.¹⁶ This provision provides an important opportunity to increase ambition over time.



CONCLUSION

The Kigali Amendment to the Montreal Protocol is a legally binding multilateral measure which mandates concrete, sector-wide GHG emission reductions for both developed and developing countries.

It represents the largest near-term climate mitigation measure from a single agreement and has the potential to catalyse significant additional climate benefits beyond what is already enshrined. With as few as three years left before the option to limit warming to 1.5°C is lost, the Kigali Amendment represents a crucial contribution to the world's commitment under the Paris Agreement to avoid dangerous climate change.¹⁷

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