OzonAction Scoop

Special Edition

A Kigali bridge between ozone protection and climate action

10 years of implementation

Developed by UNEP OzonAction in cooperation with the Multilateral Fund Secretariat, the Ozone Secretariat, the UNEP United for Efficiency Cool Coalition, and the Climate and Clean Air Coalition



Disclaimers

The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Mention of firm names and commercial products in this document does not imply endorsement by the United Nations Environment Programme or the authors. The use of information from this document for publicity or advertising is not permitted. Trademark names and symbols are used in an editorial fashion with no intention of infringement of trademark or copyright laws.

The views expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations Environment Programme. We regret any errors or omissions that may have been unwittingly made.

This factsheet draws on information from a range of sources, including official data, enforcement reports, questionnaire responses, case studies and information provided by national authorities, international and regional organizations, enforcement bodies, civil society organizations and other partners. References to reported cases, suspected violations, seizures, investigations or enforcement actions reflect the information available from the respective sources and should not be interpreted as establishing criminal liability or wrongdoing unless such liability or wrongdoing has been determined by a competent authority.

Acknowledgements

This special edition of the OzonAction Scoop was produced by the OzonAction Branch, within the Law Division of the United Nations Environment Programme (UNEP), as part of UNEP's programme of work under the Multilateral Fund for the Implementation of the Montreal Protocol.

The scoop was researched by:
Ms. Marta Pizano, consultant, Colombia.

This project was managed by:
Mr. James Curlin, Head of OzonAction Branch, Law Division, UNEP.
Ms. Tatiana Terekhova, Capacity Building Manager, OzonAction Branch, Law Division, UNEP.

With support from the OzonAction team:
Ms. Yiwei Zou, Associate Programme Management Officer, OzonAction, Law Division, UNEP.
Mr. Ruperto De Jesus, Programme Assistant, OzonAction Branch, Law Division, UNEP.
Ms. Jo Chona, Programme Assistant, OzonAction Branch, Law Division, UNEP.
Ms. Anne-Maria Fenner, Information Manager, OzonAction Branch, Law Division, UNEP.
Mr. Amr Abdel Hai, Montreal Protocol Programme Officer, OzonAction Branch, Law Division, UNEP.
Mr. Mikheil Tushishvili, Senior Programme Management Officer, OzonAction Branch, Law Division, UNEP.
Ms. Kherlenzaya Ariunbold, Programme Management Officer, OzonAction Branch, Law Division, UNEP.
Mr. Alejandro Laguna Lopez, Information Officer, OzonAction Branch, Law Division, UNEP.

Regional coordination within OzonAction networks was facilitated by **Mr. Yamar Guisse, Mr. Patrick Salifu, Mr. Pipat Poopeerasupong, Ms. Vika Rogers, Mr. Marco Pinzón, Ms. Donnalyn Charles, Mr. Khaled Klaly, Mr. Denis Toichiev, and Mr. Andrea Ossi-Perretta**.

UNEP specifically acknowledges the contribution of the following entities and experts:

Ms. Rossana Del Carmen Silva Repetto, Deputy Chief Officer of the Multilateral Fund for the Implementation of the Montreal Protocol.

Ms. Stephanie Egger Haysmith, Communications & Public Information
Montreal Protocol Ozone Secretariat, UNEP.

Mr. Amr Seleem, Country Engagement and Climate Policy Lead, Cool Coalition, UNEP.
Ms. Marisofi Giannouli, Communications Lead, Cool Coalition, UNEP.
Mr. Srinidhi Ravishankar, Cooling Policy Specialist, Cool Coalition, UNEP.

Mr. Patrick Blake, Climate and Energy Manager,United for Efficiency, UNEP.

Acknowledgements

Ms. Denise San Valentin, Programme Management Officer, Climate and Clean Air Coalition (CCAC) Secretariat, UNEP.
Ms. Oznur Ozturk, consultant,CCAC Secretariat, UNEP.

UNEP OzonAction gratefully acknowledges the contributions of Parties to the Montreal Protocol and their national authorities, including National Ozone Units, received in response to the call launched by UNEP OzonAction to support the development of awareness-raising materials marking the 10th anniversary of the Kigali Amendment. Some of these contributions will also be featured in Country Snapshots on the OzonAction website, and a full compilation will be made available on the OzonAction website.

Mr. Sonam Tashi, Director, National Ozone Unit (NOU)
Department of Environment and Climate Change, Ministry of Energy and Natural Resources, Bhutan.

Ms. Azra Rogović-Grubić, Ozone Unit Manager
Ozone Unit, Ministry of Foreign Trade and Economic Relations, Bosnia and Herzegovina.

Ms. Tatiana Lopes de Oliveira Pereira, Environmental Analyst
National Ozone Unit, Ministry of Environment and Climate Change, Brazil.

Ms. Hua Xue, Senior Programme Officer
Foreign Environmental Cooperation Center, Ministry of Ecology and Environment, China.

Mr. Rómulo Armas, Ozone Officer, Director of Innovation and Sustainable Productivity
National Ozone Unit, Ministry of Production, Foreign Trade and Investments, Ecuador.

Ms. Ninon Abraham Angrand, Coordinator
National Ozone Office, Ministry of Environment, Haiti.

Mr. Vivian Blake, Manager, National Ozone Officer
National Ozone Unit, National Environment and Planning Agency, Jamaica.

Mr. Chyngyz Saparbaev, Director
Ozone Center, Ministry of Natural Resources, Ecology, and Technical Supervision, Kyrgyzstan.

Mr. Adiyasuren Tsokhio, Director
National Ozone Authority, Ministry of Environment and Climate Change, Mongolia.

Mr. Idris Abdullahi Ishaka, National Ozone Officer
National Ozone Office, Federal Ministry of Environment, Nigeria.

Acknowledgements

Mr. Amir Mohyuddin, Additional Secretary/National Project Director
National Ozone Unit, Ministry of Climate Change, Pakistan.

Ms. Alzena Aldrin, National Ozone Officer
Environmental Quality Protection Board, Palau.

Ms. Gilda Torres, Montreal Protocol Focal Point
Ministry of Environment and Sustainable Development, Paraguay.

Ms. Ghadeer Al Haddad, Chemical Engineer
Ministry of Environment and Climate Change, Qatar.

Mr. K R Uduwawala, Secretary
National Ozone Unit, Ministry of Environment, Sri Lanka.

Ms. Marissa Gowrie, Deputy Environmental Manager and National Ozone Officer
Ministry of Planning Economic Affairs and Development, Trinidad and Tobago.

Mr. Isaac Mugabi, National Ozone Officer
National Environment Management Authority, Uganda.

Ms. Camilla Liunamel, Assistant Ozone Officer
Department of Environmental Protection and Conservation, Vanuatu.

Mr. Romer Rangel, Technical Adviser and **Ms. Hazel Tovar Fajardo**, Director
Technical Ozone Unit, Bolivarian Republic of Venezuela.

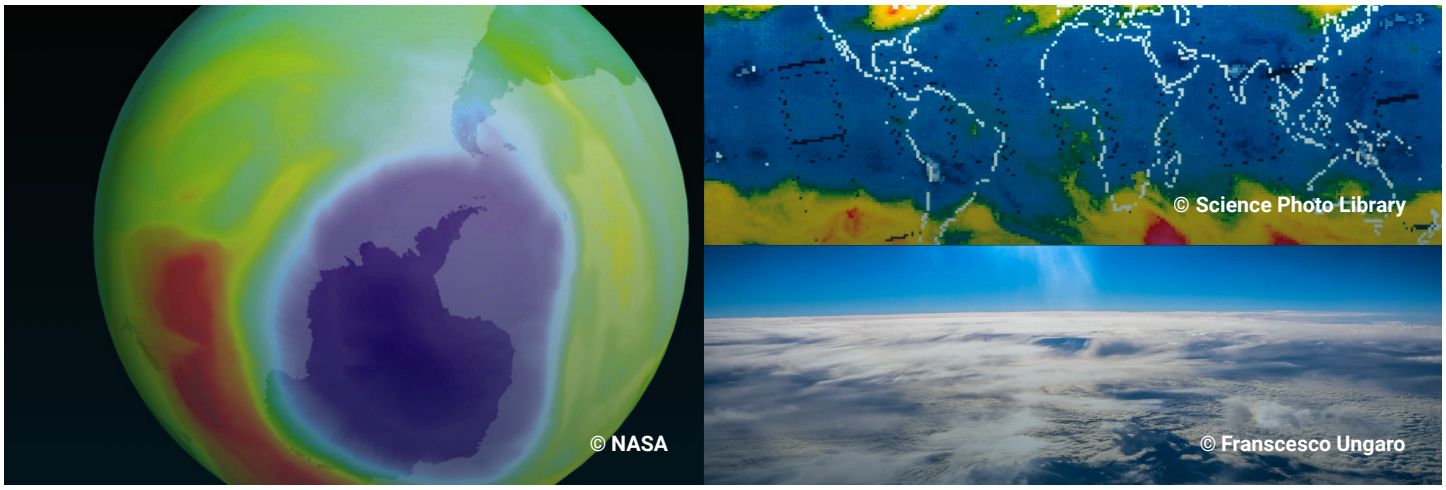
Ms. Nguyen Dang Thu Cuc, National Ozone Coordinator
Ministry of Agriculture and Environment, Vietnam.

Layout, design and production of this manual and supporting materials:

Ms. Nanon Issaratarangkul, Communication consultant, OzonAction Branch, Law Division, UNEP.

I. The Kigali Amendment ‘at a glance’

1.1 Introduction



Adopted in 1987, the Montreal Protocol on Substances that Deplete the Ozone Layer established a global framework to phase out the production and consumption of ozone depleting substances (ODS) according to agreed timetables. Widely regarded as the most successful multilateral environmental agreement, the Protocol has led to the phase-out of more than 99 per cent of controlled ODS, putting the ozone layer on a path to recovery while also delivering substantial climate benefits.

The success of the ozone layer protection regime, however, gave rise to a new challenge. As hydrochlorofluorocarbons (HCFCs) and other ODS were progressively phased out, hydrofluorocarbons (HFCs) became widely used as alternatives in refrigeration, air-conditioning, foams and other applications. While HFCs do not deplete the ozone layer, many have high global warming potentials and are potent greenhouse gases. Their rapidly increasing use therefore raised concern about their potential impact on the global climate.

Recognizing this emerging challenge, Parties to the Montreal Protocol began discussions on HFCs in 2009. Following several years of negotiations, Parties agreed in 2015 to work towards an amendment to address HFCs under the Protocol. These efforts culminated in the adoption of the Kigali Amendment on 15 October 2016. The Amendment brought HFCs under the Montreal Protocol’s regulatory framework and established a global framework for the gradual phasedown of HFC production and consumption. In doing so, the Montreal Protocol evolved from protecting the ozone layer to also making a major contribution to global climate protection, while accelerating the transition towards more climate-friendly and sustainable cooling.

Along the way, the Multilateral Fund for the Implementation of the Montreal Protocol (MLF), established in 1991 as the Protocol's financial mechanism, has been playing an important role in assisting developing countries in meeting their obligations under the Montreal Protocol. For over 30 years, the Multilateral Fund has supported developing countries in transitioning away from ODS through strategic investments, technical guidance and capacity building. Following the adoption of the Kigali Amendment, its support was expanded to assist developing countries in meeting their HFC phasedown obligations. Looking forward, the MLF will continue to play a central role in translating commitments under the Montreal Protocol and its Kigali Amendment into action on the ground, contributing to both ozone layer protection and climate mitigation.

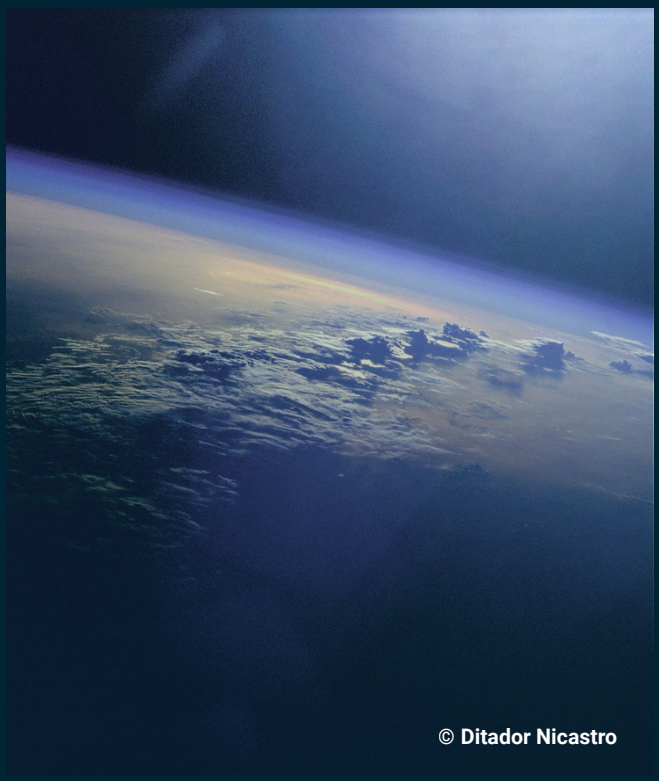
1.2 Key achievements at a glance (infographic)

As of October 2026, 176 of the 198 Parties to the Montreal Protocol had become Parties to the Kigali Amendment, representing approximately 88 per cent of all Parties.

Region	No. States*	% ratified
Africa	54	89% (5 not ratified)
Asia-Pacific	53	79% (11 not ratified)
Latin America and the Caribbean	33	85% (5 not ratified)
Eastern Europe	23	96% (1 not ratified)
Western Europe and Others	34	100%

*Note: The total of 198 Parties includes 197 States and the European Union as a regional economic integration organization. Ratification status as of 5 October 2026. Source: Ozone Secretariat.
** Central Asia included in the Asia-Pacific regional group.

- **Kigali Implementation Plan (KIPs): 188 KIP stage I preparation activities approved for 107 Article 5 Parties.**
- **KIP stage I projects approved for 91 Article 5 Parties, with funding of approximately US$174.47 million.**


© Ditador Nicastro

- Between 2016-2026 UNEP OzonAction Compliance Assistance implemented various activities, the selected achievements are presented below:
  - **148 countries supported throughout the decade**
  - **18,000+ customs officers reached, as reported in 2017**
  - **54 network and thematic meetings in 2021**
  - **116 National Ozone Officers trained in 2023**
  - **422 Energy Efficiency Twinning participants in the 2025 reporting period**
  - **1,255+ iPIC exchanges in 2026**
  - **192,000+ website users in 2024**
  - **150 OzoNews editions from 2021 to 2026*** *Until August 2026

II. Why the Kigali Amendment matters

Ten years after its adoption, the significance of the Kigali Amendment extends beyond the phasedown of HFCs. By bringing HFCs under the Montreal Protocol's regulatory framework, the Amendment has strengthened the link between ozone protection and climate action, while accelerating the transition towards more sustainable cooling. Its significance can be understood from two main perspectives.

A bridge between ozone protection and climate action: By bringing the production and consumption of HFCs under the Montreal Protocol's regulatory framework, the Kigali Amendment built on the Protocol's proven institutions, mechanisms and experience to address a rapidly growing source of greenhouse gas emissions. By 2047, global HFC use is expected to fall by 80–85 per cent. If fully implemented, the Amendment is expected to avoid up to 0.5°C of global warming by 2100[1], making it a significant contribution to global efforts to address climate change.

[1] Guus Velders et al, 'Projections of hydrofluorocarbon (HFC) emissions and the resulting global warming based on recent trends in observed abundances and current policies' Atmos. Chem. Phys., 22, 6087–6101, https://doi.org/10.5194/acp-22-6087-2022, 2022.

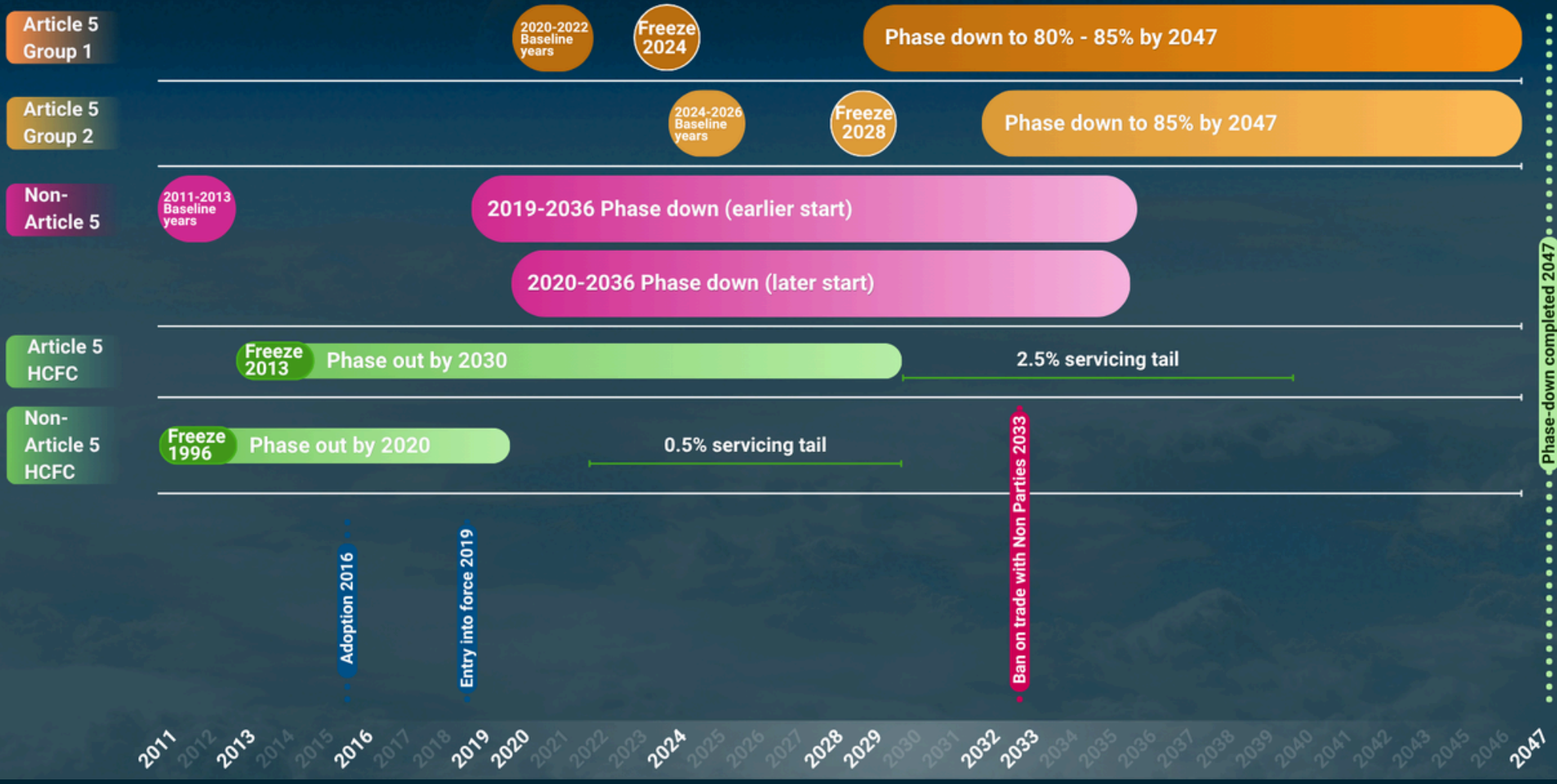
A catalyst for sustainable cooling. The HFC phasedown is driving a transition towards refrigerants and technologies with lower climate impacts, including lower-GWP alternatives and, where appropriate, natural refrigerants. This transition also provides an important opportunity to improve the energy efficiency of refrigeration and air-conditioning (RAC) equipment. Through the Multilateral Fund, Article 5 Parties receive financial and technical support to meet their HFC phasedown obligations and facilitate the transition towards more sustainable cooling solutions.

Improving energy efficiency alongside the refrigerant transition can significantly increase the climate benefits of the Kigali Amendment. When combined with improvements in the energy efficiency of cooling equipment, the climate benefits could nearly double, potentially avoiding about 1°C of warming by 2100[2]. In this way, implementation of the Kigali Amendment makes an important contribution to global efforts to achieve the temperature goals of the Paris Agreement, while advancing broader sustainable development and environmental objectives.

[2] Velders et al., "Projections of hydrofluorocarbon emissions," 2022.

HFC PHASE-DOWN TIMELINE

Key Kigali Amendment milestones and scheduled HFC reduction steps



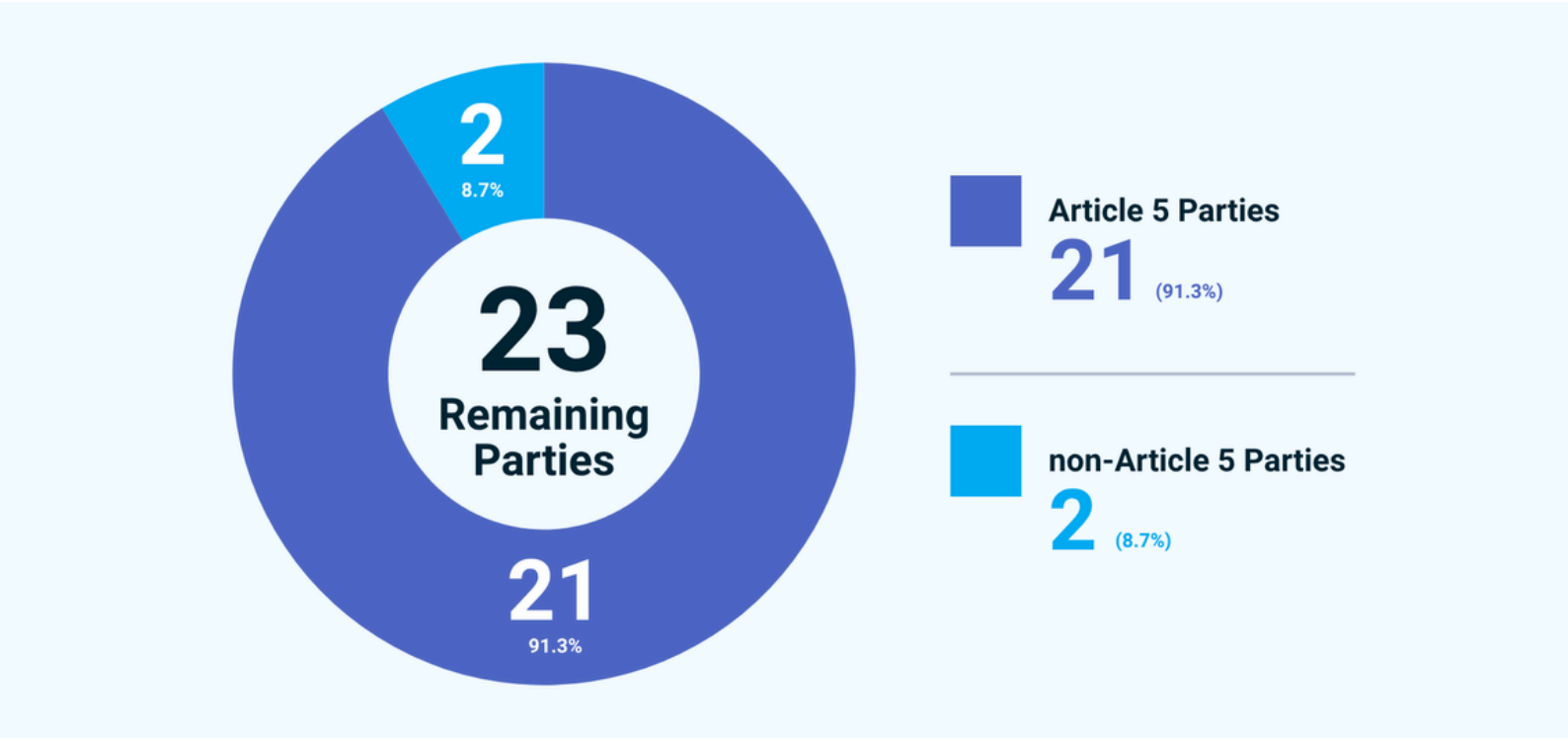
III. A decade of action: from commitment to implementation

3.1 From adoption to implementation

A. Global participation

Following the adoption of the Kigali Amendment in 2016, Parties moved swiftly toward ratification. The amendment entered into force on 1 January 2019 with a total of 65 ratifications at that time. Other countries have been taking steps to become Parties to the Kigali Amendment at a strong pace in the years that followed (Figure. 2).

As of 5 October 2026, 175 of the 198 Parties to the Montreal Protocol had become Parties to the Kigali Amendment, representing approximately 88 per cent of all Parties. Of the remaining 23 Parties that have not yet ratified, 21 are Article 5 Parties, and two are non-Article 5 Parties. The high ratification rate underscores the global commitment to reducing HFC emissions and advancing climate action through the Montreal Protocol framework.



Haiti - Achieved ratification and launched work towards the HFC phase-down.



Haiti is one of the countries that has recently ratified the Kigali Amendment. In spite of political hurdles and socio-economic difficulties, Haiti ratified the Amendment in April 2026, marking a significant milestone for the country, which now becomes eligible for developing projects with funding from the Multilateral Fund.

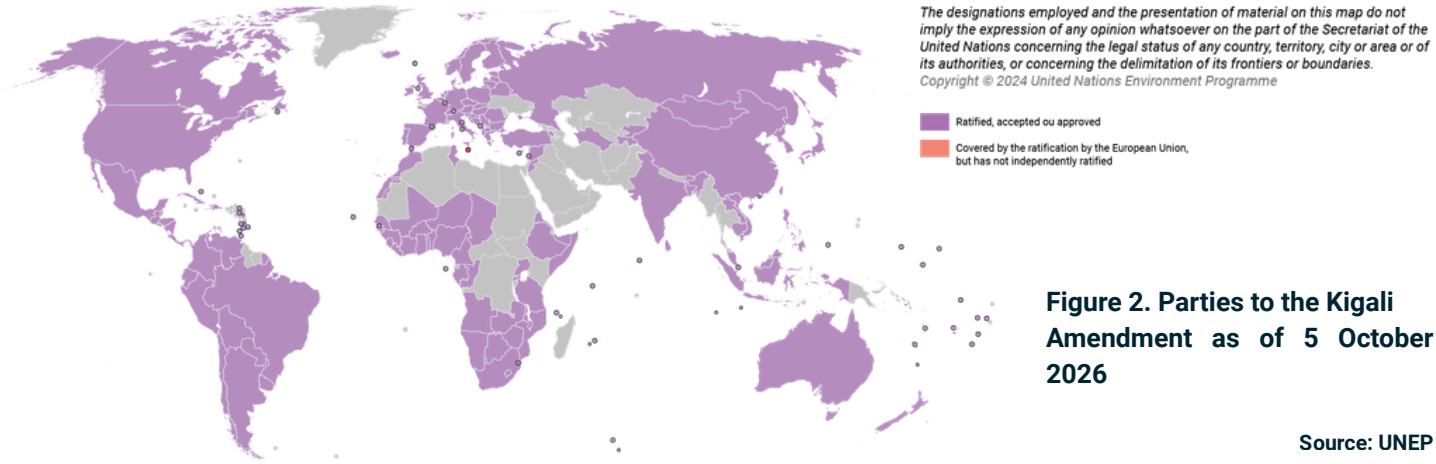


Figure 2. Parties to the Kigali Amendment as of 5 October 2026

Source: UNEP

Benefits of becoming a Party to the Kigali Amendment

Becoming a Party to the Kigali Amendment offers important benefits to the eligible Article 5 countries:

- Participation in HFC trade arrangements among Parties.
- Access to technical and financial assistance for eligible Article 5 Parties.
- Support for national capacity and technology transition, subject to applicable decisions and eligibility criteria.

Pakistan - Early action for Kigali Amendment implementation



Pakistan's experience demonstrates the value of early preparation for Kigali Amendment implementation. Before ratifying the Amendment in 2025, the country strengthened its regulatory framework by expanding its import licensing system to include HFCs, introducing customs codes for HFCs and HFC blends, and improving HFC data collection and reporting.

At the same time, national training programmes enhanced the capacity of refrigeration and air-conditioning technicians in refrigerant management, recovery and recycling, and the safe use of alternative refrigerants. Following ratification, Pakistan established its HFC licensing system, reported its HFC baseline data, and strengthened customs enforcement, laying the foundation for an effective and orderly HFC phase-down.

B. HFC phasedown schedules

The Kigali Amendment establishes differentiated HFC phasedown schedules for different groups of Parties, reflecting their respective circumstances and capacities.

- Article 5 Parties are divided into two groups with different baseline periods and phasedown schedules.
    - Group 1 comprises the majority of Article 5 Parties.
    - Article 5 Group 2 comprises ten Parties with high-ambient-temperature (HAT) conditions: Bahrain, India, the Islamic Republic of Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates.
- Non-Article 5 Parties follow an earlier phasedown schedule and, unlike Article 5 Parties, do not have a freeze period. Most began with a 10 per cent reduction in 2019 and are required to reach an 85 per cent reduction by 2036. A second group—Belarus, Kazakhstan, the Russian Federation, Tajikistan and Uzbekistan—uses a modified baseline calculation and follows different initial reduction steps.

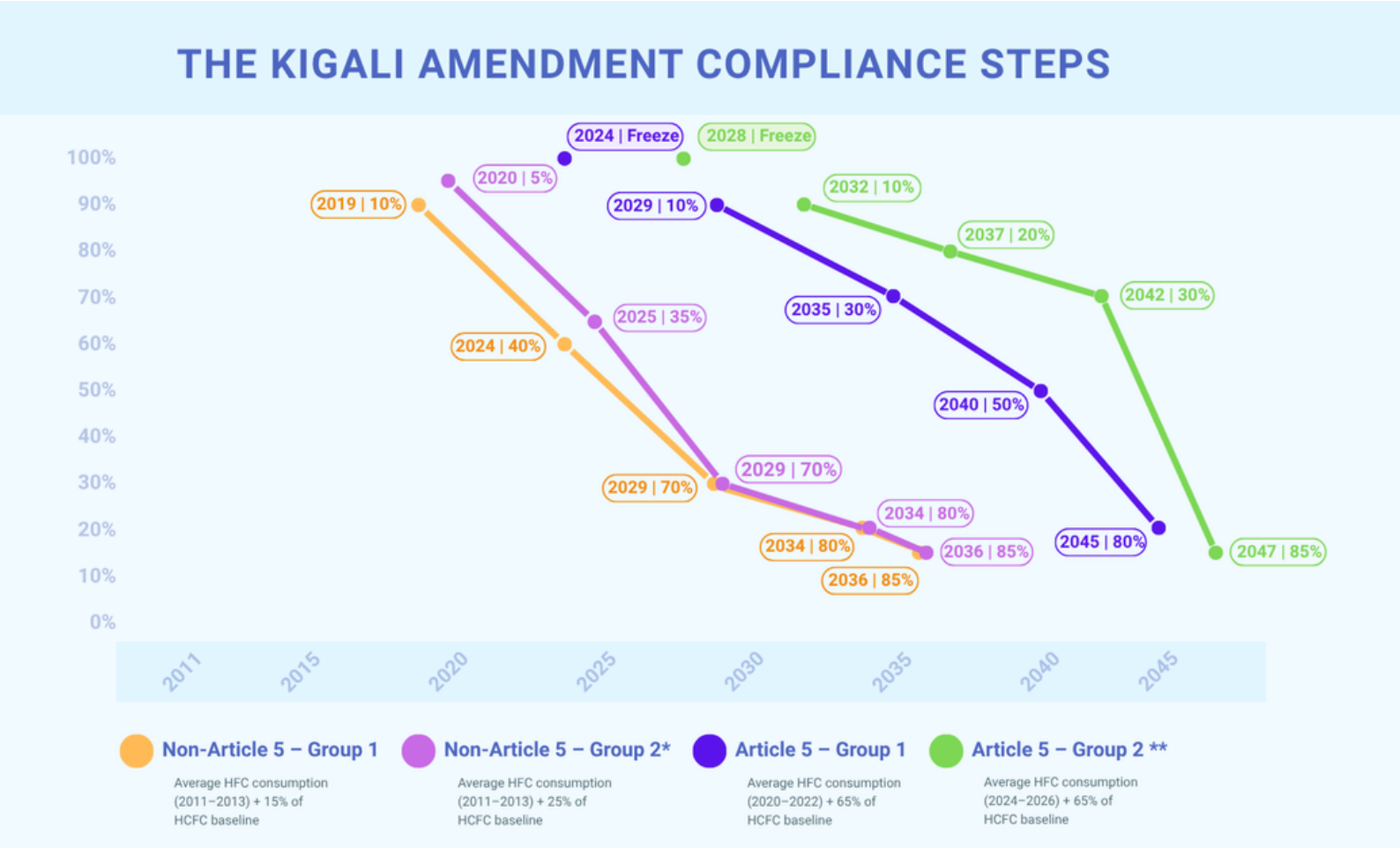


Figure 3. Kigali Amendment compliance steps

3.2 Translating global commitments into national action

Implementing the Kigali Amendment at the national level requires a combination of regulatory, administrative and enforcement measures. Depending on national circumstances, Parties may adopt a range of policy options to control HFC production, consumption and trade, strengthen monitoring and reporting, prevent emissions and build the capacity needed to sustain compliance.

Policy options for HFCs phase-down

Monitoring and controlling HFC trade	Reporting by hydrofluorocarbon (HFC) importers and exporters Import quotas for HFC Exemptions from HFC import quotas Labeling HFC containers Ban on non-refillable HFC containers Restrictions on imports/placing on the market products and equipment containing/ relying on HFCs Permits for HFC transit Permits for HFC shipment Requirement of proof of origin for HFC shipments Fees for HFC imports/ placing on the market Electronic licensing system for HFCs
Restrictions on HFC use	Specific phase-down schedules for HFCs Specific bans on HFC use Ban on new HFC installations
Record keeping of HFCs	Specific phase-down schedules for HFCs Specific bans on HFC use Ban on new HFC installations
Prevention ofHFC emissions	HFC emission control measures
Capacity building and awareness raising	Training customs officers on HFCs Training environmental inspectors on HFCs Training and certification of refrigeration technicians Training refrigeration technicians on safe use of alternative refrigerants Awareness raising of stakeholders
Additional options	Import/ export licensing system for ODS and HFCs Informal prior consent (iPIC) including ODS and HFCs

A. Strengthening national regulatory frameworks

Effective national regulatory frameworks provide the foundation for implementing the Kigali Amendment. Parties may need to review and update existing laws, regulations and administrative procedures addressing ozone depleting substances ODS to incorporate HFCs and translate international phasedown commitments into enforceable national measures. Depending on national circumstances, these frameworks can establish controls on the import, export, placing on the market, and use of HFCs and HFC-containing equipment. Roles and responsibilities should be clearly defined, and inter-agency cooperation mechanisms should be established.

Regulatory measures can also help shape markets and prevent the introduction of technologies that could lock countries into continued dependence on high-global-warming-potential refrigerants. These may include restrictions or bans on selected HFC uses and equipment, mandatory reporting and record-keeping requirements, labelling provisions, safety and technical standards, and measures to prevent refrigerant emissions. Regular review and adjustment of the regulatory framework are important as national HFC limits become progressively more stringent and lower-GWP alternatives and technologies become more widely available.

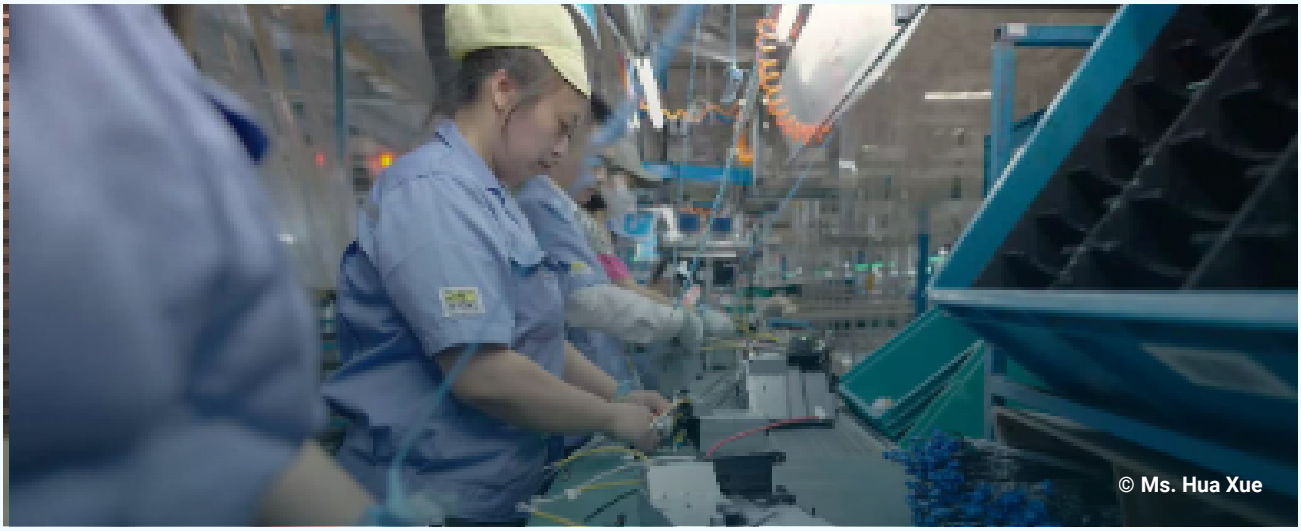
There is no single approach to incorporating Kigali Amendment commitments into national legislation. Depending on national circumstances, countries may prioritize targeted product and equipment controls or establish broader regulatory systems covering trade, consumption, standards, reporting and refrigerant management. The experiences of Palau and China illustrate how different policy approaches can support the same objective of reducing dependence on high-GWP HFCs.

Palau - Strengthening the legal framework for Kigali Amendment implementation by restricting high-GWP RAC equipment.



In 2026, Palau adopted the Ozone Layer Protection Regulation, establishing an updated legal framework for implementing the Montreal Protocol and the Kigali Amendment. A central provision prohibits the import of refrigeration and air-conditioning equipment containing HFC-134a or R-410A to reduce their use for the installation of new equipment and thus avoid future demand for these HFCs for servicing, and support a sustained reduction in national HFC consumption.

China - Strengthening the national regulatory system for HFC control



China has effectively incorporated HFC controls into its national regulatory system. Since 2024, the country has applied annual HFC quota management alongside a national import and export licensing system. In 2025, China also issued its National Implementation Plan for the Montreal Protocol for 2025–2030, setting out phased HFC reduction targets and measures to strengthen refrigerant lifecycle management. The framework reportedly combines quotas and licensing with mandatory reporting, customs supervision, labelling requirements and sectoral standards. It also provides for refrigerant recovery, recycling and emission control, while integrating energy-efficiency and safety standards into HFC management.

A circular issued in February 2026 further strengthened national management of ozone-depleting substances and HFCs. From 1 January 2029, planned restrictions will prohibit refrigerants with a GWP above 750 in specified air conditioners and those above 2,500 in most refrigeration equipment.

National regulatory frameworks may also incorporate innovative policies that go beyond conventional regulatory controls. Green public procurement can use government purchasing power to promote cooling equipment with lower-GWP refrigerants, high energy performance and lower lifecycle costs. When combined with incentives, appliance standards and digital monitoring tools, such policies can help transform markets and support the long-term objectives of the Kigali Amendment.

Kyrgyz Republic - Using green procurement to influence the cooling market



The Kyrgyz Republic's National Ozone Unit developed practical guidance to help public authorities consider energy efficiency, lifecycle costs and refrigerant climate impact when procuring refrigeration and air-conditioning equipment. The guide estimates that 90–95 per cent of the total cost of cooling equipment arises during its operating life, underscoring the importance of energy consumption, maintenance and servicing costs. In 2026, the national procurement framework was assessed to identify opportunities for integrating these criteria into procurement regulations.

B. Establishing licensing systems

Translating the HFC phasedown into national action requires effective systems to control and monitor HFC production and trade. The Kigali Amendment extended the Montreal Protocol's licensing requirements to HFCs by amending Article 4B of the Protocol. Parties are required to establish and implement systems for licensing the import and export of new, used, recycled and reclaimed controlled substances listed in Annex F.[3]

As Parties enter their HFC control periods, licensing systems are complemented by national quota systems that translate the applicable HFC consumption limits into controls on the quantities that may be imported and, where applicable, produced. Together, licensing and quota systems enable governments to monitor HFC flows, manage consumption against national control targets and support compliance with the phasedown schedule. Good practices for licensing systems include registering importers and exporters, requiring permits for individual shipments, and requiring licence holders to report on the quantities actually imported or exported. Extending licensing requirements to products and equipment containing controlled substances can further strengthen oversight of the technologies entering national markets.

[3] UNEP, Ozone Secretariat (2020). Handbook of the Montreal Protocol. Section 5.8 The Kigali Amendment (2016). https://ozone.unep.org/sites/default/files/Handbooks/MP-Handbook-2020-English.pdf

Effective implementation also depends on close coordination among National Ozone Units, licensing authorities, customs administrations and other relevant agencies. Information from licences and reports submitted by importers and exporters can be cross-checked against customs records to identify discrepancies and improve the accuracy of national data. Clear written procedures, defined institutional responsibilities, appropriate penalties and regular training for customs and enforcement officers can help ensure that the system continues to operate effectively over time[4].

Digitalization can further strengthen these systems. Electronic licensing and quota platforms can facilitate more timely exchange of information between National Ozone Units, licensing authorities and customs administrations, improve the verification of permits and quotas, reduce administrative errors and support the identification of potentially illegal shipments. Linking such platforms, where feasible, with customs electronic systems such as a single window can further enhance the traceability and monitoring of HFC trade. Where appropriate, participation in the informal Prior Informed Consent mechanism can provide an additional means of verifying proposed shipments with trading partners before they take place.

Digital licensing can be implemented through different models, depending on national administrative arrangements and existing customs infrastructure. Mongolia shows how expanding the scope of the licensing system and its digitalization can support policymakers with a broad market overview of trends, while Vanuatu provides an example of the benefits of integrating licensing, quota management and customs clearance through a national single-window platform.

[4] UNEP, Ozone Secretariat (2023). Summary of common features of licensing systems, UNEP/OzL.Pro/Workshop.11/2/Add.2–UNEP/OzL.Pro.WG.1/45/5/Add.2.

Mongolia - A distinctive approach to equipment oversight

Mongolia introduced refrigerant licensing in 2001 and expanded the system in 2018 beyond controlled substances to cover specified products and equipment containing ODS, HFCs and alternative refrigerants.

Equipment importers are required to obtain permits for six categories of RAC equipment: air conditioning (AC) units, industrial AC units, domestic refrigerators and freezers, refrigerating or freezing equipment for commercial use, for medical and laboratory use, other refrigerating or freezing equipment. They also are to report the quantities of equipment imported and sold.

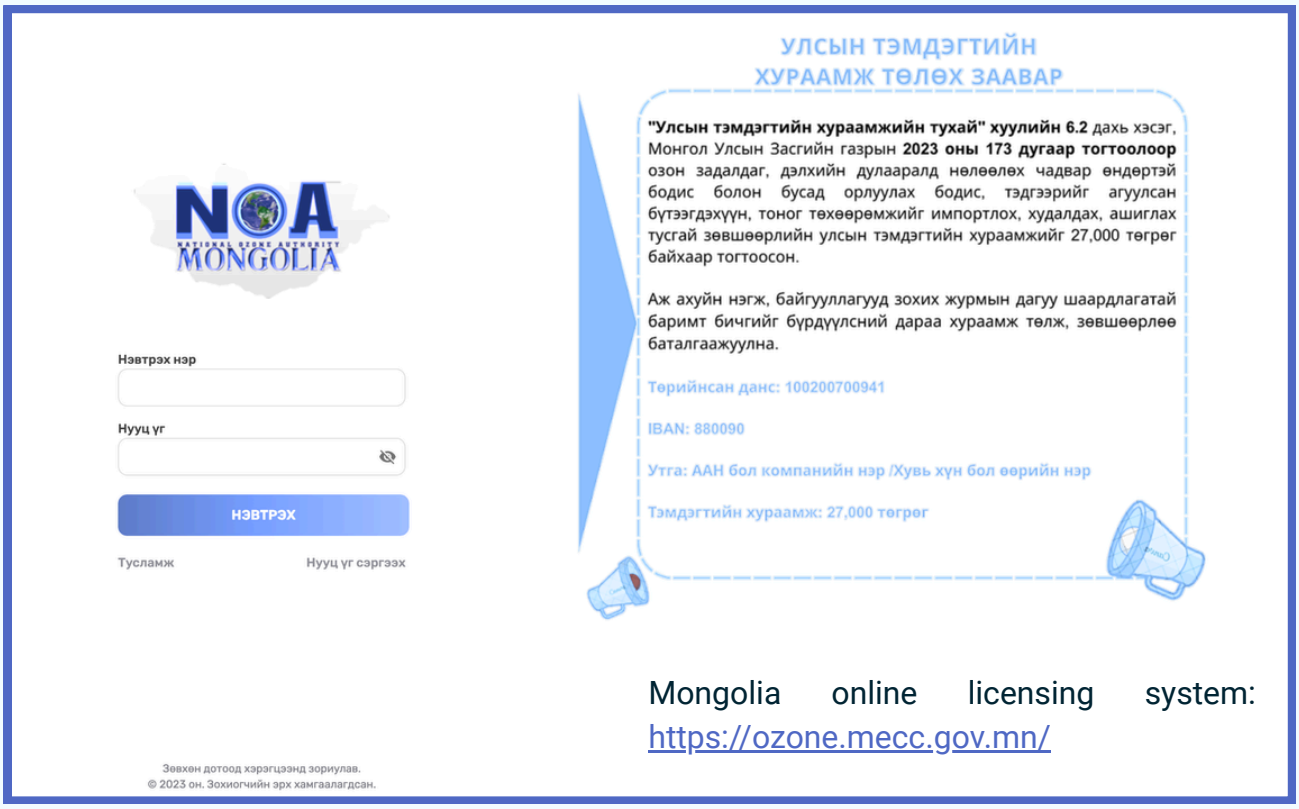
This approach gives the National Ozone Authority a structured basis for comparing equipment permits and importer reports with Customs import data. These checks help monitor equipment entering Mongolia, identify inconsistencies and strengthen implementation of import controls.

As a result, this approach creates a clear chain of evidence from licensing records to policy action, covering:

- the number and categories of imported equipment, enabling market trends to be tracked over time.
- the refrigerants and technologies associated with imported equipment, including countries of origin and shifts toward lower-GWP alternatives.
- active equipment importers, import patterns and compliance history.

Licensing equipment, rather than refrigerants alone, gives the government visibility into the technologies entering the market. It transforms an regulatory import-control function into a practical source of market intelligence.

IMPORT MONITORING	MARKET INTELLIGENCE	ENABLING TARGETED EQUIPMENT BANS
Permit records, importer reports and Customs data create an evidence trail for equipment entering the country.	The resulting information supports market analysis, technology-transition planning and future policy measures.	Because licensed equipment is identified before import, the system can support and facilitate the introduction of targeted bans on specific equipment categories or technologies.

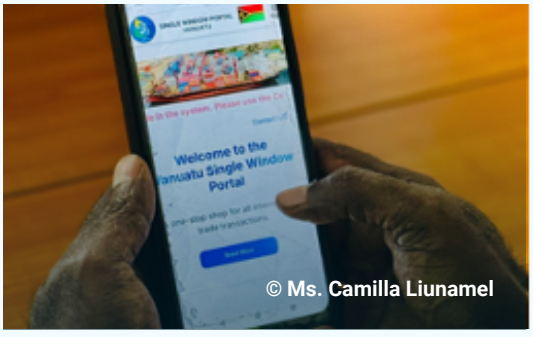


Mongolia online licensing system: https://ozone.mecc.gov.mn/

Vanuatu - Integrating licensing, quotas and customs clearance.

HFC licensing and quota management into its Electronic Single Window system. The platform connects the National Ozone Unit, customs authorities, customs brokers and importers, enabling permits and shipments to be processed through a shared digital environment. Assigned national HS codes support the identification and clearance of controlled substances and equipment.

The system reportedly enables real-time monitoring of HFC imports, automatic tracking of quota use, and customs verification of shipments. Transparent quota-allocation criteria complement the platform by providing a structured basis for managing national HFC consumption within the applicable phasedown limits. Vanuatu's experience demonstrates how a single window system can connect licensing decisions directly with border clearance, providing authorities with timely information while facilitating legitimate trade.



© Ms. Camilla Liunamel


© Ms. Camilla Liunamel

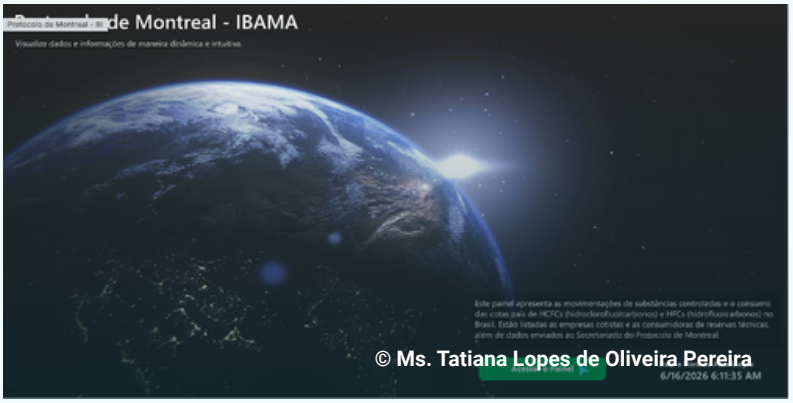
C. Strengthening data reporting and monitoring

Reliable data are essential for tracking progress and supporting compliance with the HFC phasedown. Under Article 7 of the Montreal Protocol, Parties are required to report annually to the Ozone Secretariat data on the production, imports and exports of controlled substances. The Kigali Amendment extended these reporting requirements to the HFCs listed in Annex F, enabling national consumption to be monitored against the applicable baselines and control measures.

At the national level, effective reporting depends on systems that collect, verify and reconcile information from different sources. National Ozone Units work with licensing authorities, customs administrations, importers, exporters and, where applicable, producers to compile national HFC data. Information generated through licensing and quota systems can be compared with customs declarations and reports submitted by market participants to identify discrepancies, improve data accuracy and verify that national consumption remains within applicable limits.

Digital platforms and centralized databases can facilitate this process by making relevant regulatory, licensing, quota and trade information available to authorized institutions. They can also support market analysis, national reporting and the monitoring of changes in refrigerant and equipment imports over time. Brazil provides an example of how information on controlled substances, quotas, imports and regulatory requirements can be brought together through a centralized platform.

Brazil - Centralizing information on controlled substances



Brazil has developed a Platform for Controlled Substances that brings together information relevant to the national management of ozone-depleting substances and HFCs. The platform provides stakeholders with centralized access to information on controlled substances and their global-warming potentials, applicable restrictions, import data, quotas, countries of origin, logistics and import procedures. It complements Brazil's broader regulatory framework, which includes licensing and quota systems, reporting obligations, customs requirements and restrictions on selected substances and uses.

By consolidating regulatory, trade and market information in one place, the platform aims to improve transparency and facilitate access to data for government authorities, importers, researchers, technicians and other stakeholders. It can also support market analysis, training and information dissemination, helping stakeholders understand evolving HFC controls and strengthening the information base for implementation of the Kigali Amendment.

D. Strengthening customs control and enforcement

Effective customs control and enforcement are essential for ensuring that national HFC measures are applied at the border. Customs authorities verify whether shipments of controlled substances and relevant equipment comply with licensing, quota and other regulatory requirements. Close cooperation among National Ozone Units, customs administrations, licensing authorities and other enforcement bodies is therefore important for translating national HFC controls into effective border action.

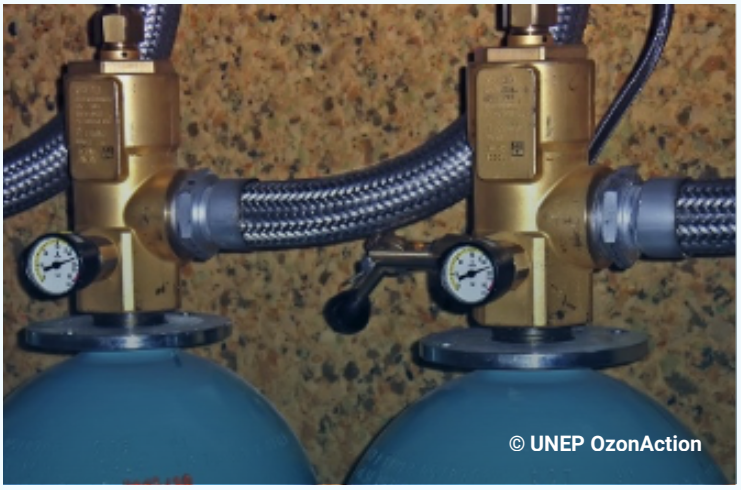
Accurate classification and identification are central to this work. HS codes and, where appropriate, more detailed national or regional customs codes can help officers distinguish individual HFCs and refrigerant blends, reduce misclassification and improve the targeting of inspections. Training, refrigerant identifiers, clear procedures and risk-profiling tools can further strengthen the ability of customs and enforcement officers to verify documentation and identify potentially non-compliant shipments.

Timely information exchange also supports enforcement. Customs authorities may need access to licensing and quota information to verify whether a shipment is authorized and whether the importer has sufficient quota available. Digital links between licensing and customs systems can facilitate shipment-level checks, while the informal Prior Informed Consent mechanism enables voluntary exchanges between trading countries to clarify the legitimacy of proposed shipments.

As HFC quotas become progressively tighter, continued attention to enforcement will be increasingly important. Differences in prices, availability and regulatory requirements may create incentives for illegal trade, while transit arrangements, free trade zones, online sales and complex supply chains can present additional monitoring challenges. Stronger risk profiling, market surveillance, intelligence sharing and cross-border cooperation can help Parties prevent illegal trade while facilitating legitimate trade in controlled substances and alternatives.

Country experiences highlight complementary enforcement approaches. Pacific Island countries have strengthened refrigerant classification through dedicated regional HS codes, while Nigeria has combined updated HFC regulation and inter-agency coordination with targeted training for customs trainers, frontline officers and clearing agents.

Pacific Island Countries - Regional HS codes as tool for effective HFC trade controls



Fourteen Pacific Island countries collaborated with UNEP and the Oceania Customs Organization to develop dedicated HS codes for HFCs and HFC-containing blends under the Pacific Harmonized Commodity Description and Coding System. The regional codes in the common classification system enable customs authorities to distinguish more accurately between individual refrigerants and blends and verify declarations, reducing the risk of misclassification and strengthening national licensing and quota systems. They also improve the consistency of customs information available to national licensing and reporting systems.

Participating countries share trade data and periodically review the substances and mixtures used in the region to ensure that the codes remain relevant. The initiative highlights the value of regional cooperation in addressing enforcement challenges faced by smaller markets.

Nigeria - Strengthening customs capacity

Nigeria strengthened the regulatory basis for HFC control by updating its regulations on ozone-depleting substances to incorporate HFC phasedown provisions as published in 2023. The National Ozone Office has also worked with the permit authority, customs administration and other stakeholders to strengthen the implementation of the HFC licensing and quota system.



Targeted training helped customs personnel and clearing agents strengthen their understanding of Kigali Amendment requirements, HFC controls and implementation of the national quota system. The activities reached 40 customs trainers, 50 customs officers and 80 customs clearing agents. By combining updated regulation, inter-agency coordination and customs training, Nigeria is strengthening the capacity needed to facilitate legitimate trade and identify potentially non-compliant shipments.

E. Strengthening the RAC servicing sector and supporting a safe transition to low-GWP technologies

A skilled RAC servicing workforce is essential for the effective implementation of the Kigali Amendment. As lower-GWP refrigerants and new equipment enter national markets, technicians need the knowledge, qualifications and tools to install, operate, maintain and decommission systems correctly. Training, certification and recognition of existing competencies can strengthen professional standards, improve servicing practices and help reduce refrigerant leakage and avoidable emissions. Cooperation with technical and vocational education institutions, universities and industry associations can also help embed these skills within national training systems and sustain capacity over time.

At the same time, many lower-GWP alternatives have safety characteristics that require updated technical knowledge and working practices. Depending on the refrigerant and application, technicians may need training in handling flammable, toxic or high-pressure substances, supported by appropriate safety standards, equipment and procedures. Capacity building can therefore help countries expand the safe use of alternatives while strengthening refrigerant recovery, recycling and regeneration, improving energy performance and supporting more circular approaches to refrigerant management.

Country experiences highlight complementary approaches to strengthening the RAC servicing sector and supporting a safe transition to lower-GWP technologies. Sri Lanka focuses on formal recognition and certification of experienced but previously uncertified technicians. Ecuador combines training-of-trainers programmes with refrigerant recovery and regeneration. Bhutan links technician training with stronger training institutions, competency-based education and trainer development. Qatar emphasizes the importance of technical dialogue and locally appropriate solutions in high-ambient-temperature conditions, while Bosnia and Herzegovina shows practical capacity building for the safe handling of natural and flammable refrigerants. Together, these cases show how certification, institutional development, technical cooperation and practical safety training can professionalize the RAC servicing workforce and enable the safe adoption of climate-friendly technologies.

Sri Lanka - Recognizing the skills of experienced RAC technicians

Sri Lanka's National Ozone Unit introduced a competency-based Recognition of Prior Learning programme to formally recognize experienced but uncertified refrigeration and air-conditioning technicians. Through the programme, technicians working in the informal sector can have their existing competencies formally assessed, obtain nationally recognized National Vocational Qualification level 3 or 4, and access continuing professional development. This helps strengthen professional standards while expanding the pool of qualified technicians available to support the refrigerant transition.

The programme complements technician training on the safe installation and servicing of equipment using natural and other lower-GWP refrigerants under stage I of Sri Lanka's Kigali Implementation Plan. This transition is also supported by a safety standard for flammable and toxic refrigerants, SLS 1262:2025, and by continued cooperation between the National Ozone Unit and technical education institutions. Sri Lanka's experience

highlights the role of skills recognition, national qualifications and continuing technical training in preparing the RAC workforce for evolving technologies and safety requirements.

Ecuador - Linking trainer development with refrigerant regeneration

Ecuador has combined training-of-trainers programmes with refrigerant recovery, regeneration and the safe handling of lower-GWP alternatives. The Ministry of Economic and Productive Development, through its National Ozone Unit, UNIDO, universities and technical institutions, have helped develop national training capacity, with dozens of instructors trained and nearly one tonne of HFCs reportedly regenerated. The initiative links workforce development with improved refrigerant management, circular-economy practices and the transition towards climate-friendly cooling.





Beyond recognizing and training individual technicians, sustainable workforce development also requires strong training institutions, qualified trainers, suitable curricula and practical equipment.

Bhutan - Building a future-ready RAC servicing workforce

Bhutan is strengthening its RAC servicing workforce to support the safe transition towards climate-friendly cooling. Working with technical training institutes and the national technical and vocational education and training authority, the National Ozone Unit has supported training on good servicing practices, refrigerant recovery, leak detection and prevention, energy efficiency, and the safe handling of low GWP and flammable refrigerants. Training centres have also been assessed and provided with tools and equipment to support competency-based education.





In 2024, 60 RAC servicing technicians from government, civil society and the private sector were trained, while six trainers from technical training institutes received competency-based assessment training. In early 2026, an additional 15 technicians participated in a training-of-trainers workshop on refrigerant recovery, leak detection, and energy efficiency. Furthermore, in September 2026, 10 trainers and assessors participated in a two-day training on competency-based training and assessment, including an introduction to energy-auditing practices, while an additional 11 technicians participated in the two-day training on good servicing practices and energy-efficiency in the RAC sector. Altogether, 21 trainers, assessors and technicians were trained through this four-day workshop.

This is a practical example on the ground of how, by strengthening both technicians and the institutions that train them, Bhutan is building national capacity to reduce refrigerant emissions and safely service emerging cooling technologies.

Even where workforce and institutional capacity are in place, the suitability of lower-GWP alternatives depends on national circumstances, including climate, equipment design, safety requirements and market conditions. This is particularly important in high-ambient-temperature countries.

Qatar - Addressing technology needs of countries with high-ambient-temperature conditions

As a high-ambient-temperature country, Qatar must identify lower-GWP cooling technologies that can operate safely, efficiently and reliably under extreme climatic conditions. A technical workshop convened by the Ministry of Environment & Climate Change in November 2025 brought together government, industry, academia and technical experts to examine suitable alternatives and related challenges. The discussions also highlighted technician training and certification as essential for the safe and reliable adoption of new technologies.

Natural refrigerants, including hydrocarbons, ammonia and carbon dioxide, can offer very low or negligible global warming potential, but their properties require appropriate equipment, skills and safety measures. Some lower-GWP refrigerants, including hydrocarbons and certain synthetic alternatives, are flammable. Ammonia has toxicity considerations, while carbon dioxide systems operate at comparatively high pressures. Their safe use therefore depends on appropriate equipment design, applicable standards, risk assessment, technician training, suitable tools and correct installation and servicing procedures. The case of Bosnia and Herzegovina highlights how practical training and institutional capacity can support the safe introduction of these technologies.

Bosnia and Herzegovina - Building capacity for the safe use of natural refrigerants

In 2025, the National Ozone Unit of **Bosnia and Herzegovina** organized five workshops in Brčko, Banja Luka, Jajce, Sarajevo and Mostar on the safe use of natural refrigerants. The workshops trained 232 service technicians, installers, refrigerant importers, equipment suppliers, engineers and system designers in handling and servicing systems using hydrocarbons, carbon dioxide and ammonia. The training addressed their different safety characteristics, including the flammability of hydrocarbons, the toxicity considerations associated with ammonia and the high operating pressures of carbon dioxide systems.

Outreach through the Refrigeration, Air Conditioning and Heat Pumps (RACHP) Association of the Foreign Trade Chamber of Bosnia and Herzegovina reached more than 700 companies and sector stakeholders. Strong interest, including more than 50 applicants who could not initially be accommodated, led to an additional workshop in Sarajevo. By strengthening practical knowledge, safety awareness and servicing capacity, the initiative is helping prepare the RACHP sector for the safe adoption of lower-GWP technologies and supporting implementation of the Kigali Amendment.

F. Strengthening lifecycle refrigerant management

As countries advance in implementing the Kigali Amendment, greater attention is being given to managing refrigerants throughout their lifecycle. Measures to prevent leaks, promote proper servicing, and support the recovery, reuse, recycling and reclamation of refrigerants can reduce avoidable emissions while making better use of substances already in circulation. At the end of equipment life, appropriate collection, identification, storage, transport and environmentally sound destruction are also important for preventing refrigerants from being released into the atmosphere.

Effective lifecycle refrigerant management requires enabling policies, trained technicians, suitable equipment and infrastructure for collection, reclamation or destruction. Country experiences highlight different but complementary approaches to lifecycle refrigerant management. Viet Nam has embedded responsibilities across the refrigerant lifecycle within an integrated regulatory framework. Jamaica is linking recovery, recycling and reclamation infrastructure with workforce development, institutional oversight and enforcement capacity. Venezuela demonstrates practical implementation through refrigerant collection, identification, regeneration and arrangements for disposal. Together, these cases show how regulation, infrastructure, technical capacity and operational systems can support effective refrigerant management throughout the lifecycle.

Viet Nam - Embedding lifecycle refrigerant management in national regulation



In 2022, Viet Nam adopted Decree No. 06/2022/ND-CP, establishing a comprehensive legal framework for managing HFCs and other controlled substances throughout their lifecycle. The framework extends beyond licensing and quotas to cover production, import, export and use, as well as equipment registration, refrigerant collection, recovery, recycling, reuse

and environmentally sound disposal. Organizations involved at different stages of the refrigerant lifecycle are required to register with the competent authority and report annually, thus establishing traceability and accountability.

The regulatory framework was further strengthened in 2025 through Decree No. 119/2025/ND-CP, which introduced application-specific GWP limits and a phased roadmap for restricting selected high-GWP refrigerants and equipment. Supporting regulations set out procedures, compliance monitoring and enforcement measures. Viet Nam's framework links lifecycle refrigerant management with licensing, quotas, reporting, equipment controls and environmentally sound end-of-life management, providing an integrated national approach.

Jamaica - Building capacity for refrigerant recovery, recycling and reclamation

In 2025, through assistance provided by the United Nations Development Programme (UNDP), Jamaica established refrigerant recovery, recycling and reclamation centres to strengthen national refrigerant management and support the phase-out of HCFC-22 by 2030. The centres are hosted by academic and vocational training institutions and a private refrigeration and

air-conditioning company which helps to establish a strategic link between refrigerant-management infrastructure and technical training and industry practice. An oversight committee was also established to guide the operations of the centres in achieving the main objective of phasing out HCFC-22 by 2030. The work of the centres is being further supported by a public-awareness campaign.

The initiative was complemented by training at the University of Technology, Jamaica, for RAC technicians on good refrigeration practices, energy efficiency and refrigerant recovery, recycling and reclamation (RRR&R). Thirty technicians, including three women, participated in two workshops in November 2025. A further 52 customs, enforcement and

regulatory officials received training on licensing and quotas, customs codes, illegal trade and the use of refrigerant identifiers. Jamaica's approach brings together infrastructure, technical skills and enforcement capacity to support more effective lifecycle refrigerant management.

Two photographs of the RRR&R Centre located on the Human Employment and Resource Training/National Service Training Agency Trust (HEART/NSTA Trust) College of Construction Services campus, Portmore, St. Catherine, Jamaica.

Venezuela - Building RAC capacity and strengthening refrigerant regeneration


© Mr. Romer Rangel

In 2025, Venezuela expanded training in good refrigeration practices for technicians, students, and environmental officials, combining classroom instruction with practical work on refrigerant recovery, leak prevention, hydrocarbons, and energy efficiency. During the year, 153 technicians were accredited, 526 technicians were reached through awareness and technical activities, and 100 thermal-mechanics students were trained. The workshops also addressed the safe handling of natural refrigerants and the skills needed to service emerging cooling technologies. These activities were complemented by efforts to strengthen refrigerant recovery and regeneration. The Venezuelan Fund for Industrial and Technological Conversion Foundation (FONDOIN), which hosts Venezuela's Technical Ozone Unit, supported training, refrigerant recovery and regeneration activities in 2025. FONDOIN provided refrigerant identifiers and technical training to regeneration centres, while supporting procedures to determine whether recovered refrigerants could be regenerated or required disposal. The report indicates that 1,260 kg of fluorinated refrigerants were collected for regeneration and 340 kg for destruction at the Francisco de Miranda National Refrigerant Regeneration Centre, alongside work to establish a regeneration centre in Zulia. Together, these measures strengthened technician capacity, refrigerant identification and regeneration infrastructure, helping improve refrigerant management and reduce avoidable emissions.

3.3 Enabling the transition

Achieving the hydrofluorocarbon HFC phasedown requires more than setting reduction targets. It requires sustained financial support, national planning, enabling policies and institutions, technical capacity and access to suitable technologies. The Montreal Protocol has built an implementation architecture over more than three decades to support developing countries in translating their international commitments into action at the national and sectoral levels.

A. Financing the transition: the Multilateral Fund

Since the adoption of the Kigali Amendment, the Multilateral Fund has expanded its support to assist Article 5 Parties in meeting their HFC phasedown obligations. Building on more than three decades of experience in supporting the phase-out of ozone-depleting substances, the MLF provides financial and technical assistance for a broad range of activities, including the preparation and implementation of KIPs, institutional strengthening, capacity building, technology conversion and measures to improve energy efficiency while phasing out HCFCs and phasing down HFCs in the RAC sector.

As Article 5 Parties advance with their HFC control measures, MLF support has increasingly shifted from enabling and preparatory activities towards national phasedown strategies and sectoral transitions.

The Fund is also evolving to address opportunities that extend beyond refrigerant substitution. Following its establishment, the US$40 million Energy Efficiency Revolving Fund moved towards implementation, with two projects approved by the Executive Committee in June 2026[5], providing a new financing mechanism to support the replacement of existing RAC equipment with energy-efficient, low-GWP technologies. This reflects the growing importance of integrating energy efficiency into the HFC transition in order to maximize its climate benefits.

B. Planning and implementing the transition: Kigali Implementation Plans

Kigali Implementation Plans provide the strategic framework through which Article 5 Parties plan and implement measures to meet their HFC phasedown obligations. KIPs are tailored to national circumstances and bring together policy and regulatory measures, institutional strengthening, servicing-sector interventions, capacity building and, where relevant, investment activities to support a staged reduction in HFC consumption.

Implementation is structured in stages aligned with the control schedules under the Kigali Amendment. For the majority of Article 5 Parties, stage I is designed to support compliance with the 2024 freeze in HFC consumption and the first reduction step of 10 per cent below the baseline by 2029. Through their KIPs, countries identify priority sectors and measures, establish implementation arrangements and a range of policy, capacity-building and investment activities according to national needs.

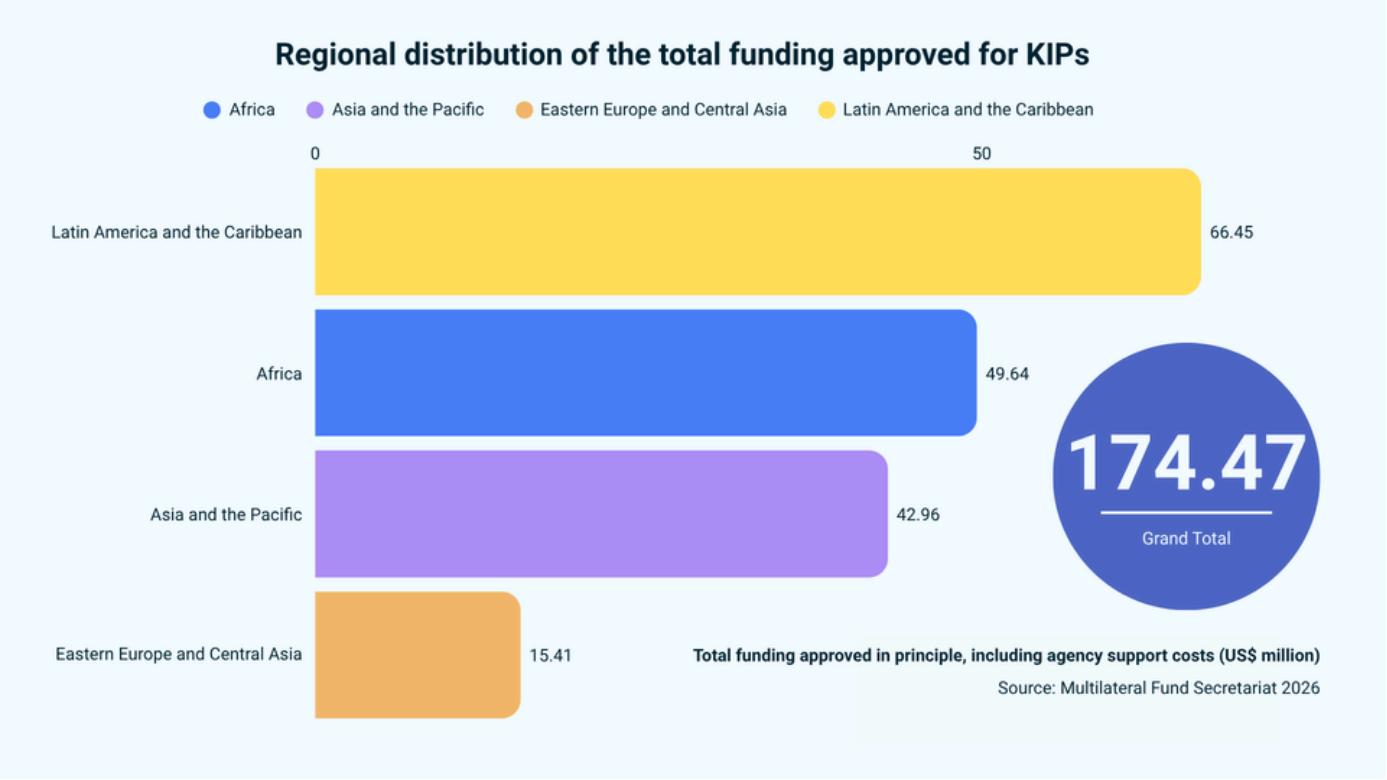
Preparatory support provided by the Multilateral Fund has helped countries build the institutional, regulatory and technical foundations required for implementation. By the 98th Meeting of the Executive Committee, held in June 2026, 161 enabling activity projects had been approved for 141 countries, with funding of approximately US$18.7 million. As Article 5 countries advanced, support increasingly shifted towards the preparation and implementation of KIPs: 188 KIP preparation activities, amounting to approximately US$21.5 million, had been approved for 107 countries.

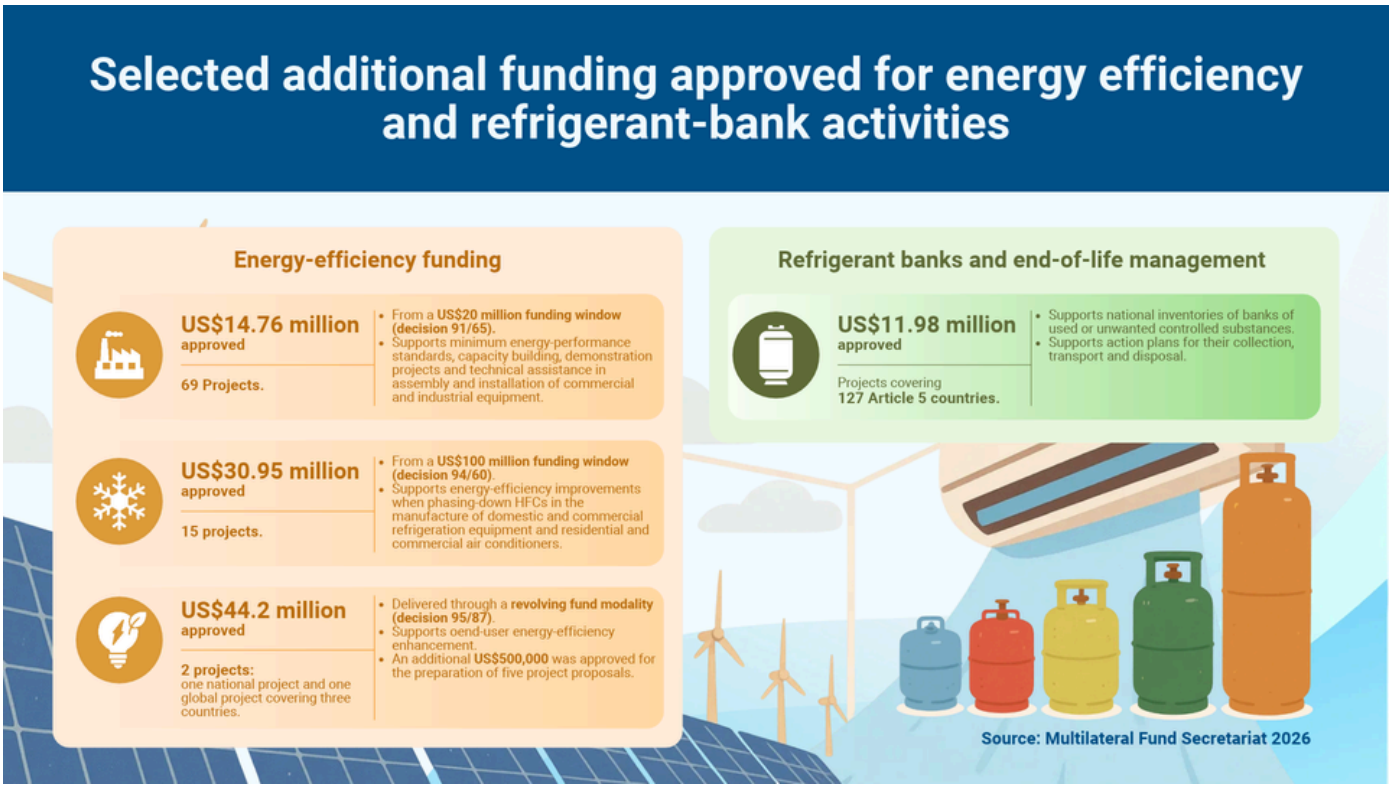
---

[5] Multilateral Fund (2025). 2025: A milestone year for Montreal Protocol implementation.

By the same date, the Executive Committee had approved stage I KIPs covering 91 Article 5 Parties, with total funding of approximately US$ 174.5 million. These plans are now translating national HFC phasedown strategies into concrete policy, capacity-building and sectoral actions[6].

Out of 91 countries, 54 consumed on average less than 360 mt of HFCs during their baseline years for servicing refrigeration and air-conditioning equipment; 13 consumed between 360 and 706 mt; and 24 consumed above 706 mt.





[6] Multilateral Fund Secretariat, email communication to the authors in August 2026.

C. Strengthening institutions, capacity and stakeholder engagement

Strong institutions and sustained technical capacity are essential for translating HFC phasedown commitments into effective national action. Through its Compliance Assistance Programme (CAP), UNEP OzonAction provides direct support to 147 Article 5 Parties, helping countries strengthen the institutional, policy and technical capacities needed to achieve and sustain compliance with the Montreal Protocol and its Kigali Amendment. This support includes policy and technical assistance, capacity building, knowledge sharing and regional cooperation, while facilitating the transition towards lower-GWP and more sustainable cooling technologies.

CAP assists countries in designing and implementing a range of complementary measures, from regulatory and enforcement tools to training, awareness raising and institutional strengthening, tailored to national circumstances and needs.

In 2025, CAP supported 59 countries in strengthening data collection and improving data accuracy, while 103 institutional-strengthening projects were implemented and monitored. A total of 107 National Ozone Units received targeted country- or regional-level compliance assistance on operational, technical and policy issues, and 84 new Ozone Officers received training to strengthen their understanding of the Montreal Protocol and its Kigali Amendment.[7]

Regional cooperation is another cornerstone of CAP. Through ten Regional Networks, National Ozone Officers from all 147 Article 5 Parties are brought together to exchange experience, identify emerging challenges and foster cross-border cooperation. These networks also facilitate cooperation with key partners such as the Multilateral Fund Secretariat, the Ozone Secretariat, implementing and bilateral agencies, and other technical experts.


© UNEP OzonAction


© UNEP OzonAction


© UNEP OzonAction

[7] UNEP OzonAction (2025). UNEP's Compliance Assistance Programme Budget for 2026. UNEP/OzL.Pro/ExCom/97/83

Capacity building also extends beyond National Ozone Units. Customs and enforcement officers require the knowledge and tools to identify and control HFC trade, while RAC technicians need to acquire the expertise to safely install, service and maintain equipment using alternative refrigerants. To support this transition, CAP encourages training, certification, good servicing practices and greater collaboration with technical and vocational education institutions, helping countries build the skilled workforce needed to sustain progress over the longer term.

Over the decade, CAP support has increasingly accompanied countries from regulatory and institutional readiness towards implementation of KIPs, enhanced enforcement, servicing-sector transformation and emerging work on energy efficiency and refrigerant lifecycle management. Regional networks and country-specific assistance have remained central to this support, while international cooperation with global and regional entities with the mandates in enforcement, training institutions and energy-efficiency stakeholders has broadened.

Support has also evolved to address the circumstances of Low-Volume-Consuming countries, including occupational safety, technician certification and sustainable cooling. Gender considerations and opportunities for women's participation have received increasing attention in programme activities.[8]

Stakeholder engagement and awareness raising complement these efforts by helping governments, industry, technicians and the wider public understand evolving HFC controls and the transition towards lower-GWP alternatives. In 2025, the CAP facilitated 34 information-exchange events, study tours, technology roundtables and meetings between National Ozone Units, as well as 15 twinning workshops connecting National Ozone Officers with energy policymakers, and 50 information sessions providing technical advice and support on data collection and analysis.[9]

World Ozone Day provides an annual platform for Parties to communicate progress on ozone protection and climate action and engage a wider range of stakeholders in the Montreal Protocol and its Kigali Amendment.

Qatar – Engaging youth in ozone and climate protection

To mark the World Ozone Day 2025, Qatar's National Ozone Unit and Public Relations Department launched the "Children's Creativity for Protecting the Ozone Layer" competition through the Ministry of Environment and Climate Change's social media platforms. A three-day public-awareness booth displayed students' contributions and offered interactive games and competitions. Five competition winners and 20 outstanding submissions were recognized.

[8] UNEP OzonAction (2025) Compliance Assistance Programme Budget for 2026. UNEP/OzL.Pro/ExCom/97/83; UNEP OzonAction (2024). UNEP's Compliance Assistance Programme Budget for 2025. UNEP/OzL.Pro/ExCom/95/83. UNEP OzonAction (2023). UNEP's Compliance Assistance Programme Budget for 2024.UNEP/OzL.Pro/ExCom/93/94.

[9] UNEP OzonAction (2025) Compliance Assistance Programme Budget for 2026. UNEP/OzL.Pro/ExCom/97/83.

The campaign also brought tailored awareness workshops to six schools, engaging more than 460 students through presentations, question-and-answer sessions and educational activities. Social-media content supporting the campaign highlighted World Ozone Day, the Montreal Protocol and Qatar's national commitment to ozone protection. This is an example of how creative competitions, school outreach and public events can make ozone and climate issues accessible to younger audiences and encourage their participation in environmental action.



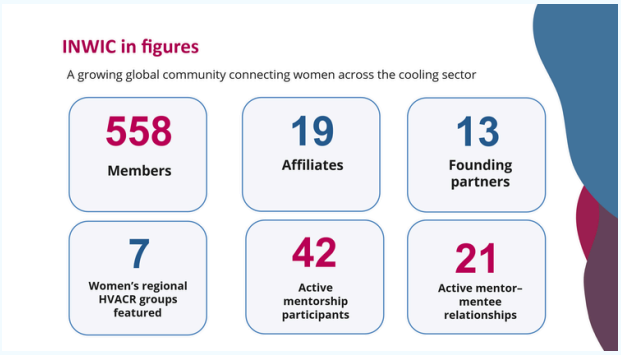


D. Promoting an inclusive transition

The transition towards lower-GWP technologies also provides opportunities to promote greater inclusion and participation in sectors where women have traditionally been underrepresented. In 2019, the Executive Committee of the Multilateral Fund adopted an operational policy on gender mainstreaming for Multilateral Fund-supported projects. The policy calls for gender considerations to be integrated throughout the project cycle, including project preparation, implementation, monitoring and evaluation, while strengthening the capacity of implementing and bilateral agencies and Article 5 Parties to identify and address gender-related opportunities and barriers.

Gender-responsive approaches are increasingly being incorporated into Montreal Protocol activities, including Kigali Implementation Plans KIPs and capacity-building programmes. Depending on national circumstances, these may include gender analysis and sex-disaggregated data, targets or indicators for women's participation in training and certification programmes, inclusive recruitment practices, targeted opportunities for women in the RAC sector, and support for women-led enterprises.

International Network of Women in Cooling (INWIC) - INWIC is a collaborative initiative established by UNEP OzonAction in partnership with World Refrigeration Day (WRD) and eleven Refrigeration, Air Conditioning and Heat Pump (RACHP) associations to advance women's participation, leadership, and career opportunities across the cooling sector. Through this global network, UNEP OzonAction harnesses the expertise, resources, and outreach of RACHP industry partners to support Article 5 countries in the implementation of Montreal Protocol projects and activities. INWIC provides a range of support mechanisms, including a global networking community, a membership platform, and a mentoring programme. Founding partners further contribute through webinars, technical training, knowledge-sharing opportunities, and access to industry events. More information can be found here.



Paraguay – Recognizing gender equality in the RAC sector

Through its "Friends of Ozone and Climate" awards, Paraguay's Ministry of Environment and Sustainable Development (MADES) recognizes companies, professional associations and technicians contributing to ozone and climate protection. Since the adoption of the Kigali Amendment, the awards have evolved to highlight low-GWP technologies, good refrigerant-management practices and a gender-responsive approach in the refrigeration and air-conditioning sector.



At the awards held on 16 September 2025 to mark the World Ozone Day, two women and two organizations were recognized in the category of equal opportunities in the RAC sector. By highlighting the contributions of women and organizations advancing gender equality, the initiative helps increase their visibility and encourages more inclusive participation in the transition towards climate-friendly cooling.

3.4 A decade of progress — flagship country experiences

Country experiences show how regulatory measures, institutional coordination, technical capacity and stakeholder engagement can be combined over time. Trinidad and Tobago presents an integrated approach linking HFC controls, energy efficiency and wider cooling and climate policies, while Uganda demonstrates how legal reform, enforcement, technical training and broad public engagement can reinforce one another.

Trinidad and Tobago – Integrating HFC controls with sustainable cooling

As the first Caribbean Party to ratify the Kigali Amendment [in 2017], Trinidad and Tobago has developed an integrated approach to managing HFC controls and attaining sustainable cooling by combining regulations, technical capacity development and public-private cooperation. Its national framework includes a multi-stakeholder Montreal Protocol management committee, HFC licensing and quotas, trade and equipment controls, border monitoring and verification, compulsory labelling and equipment standards, and refrigerant recovery, recycling and reclamation. Collaboration with the RAC sector has supported implementation, while training institutions have received equipment and materials to promote good refrigeration practices for sustainable cooling.

Over the past decade, more than 300 customs and other border-control officers have been trained, alongside RAC technicians. More than 75 awareness and sensitization sessions have engaged stakeholders across the public and private sectors. The country has also developed two standards addressing RAC equipment requirements, a National Cooling Strategy and an updated National Climate Change Policy. Together, these measures led to closer linkages between refrigerant transition, energy efficiency, technical capacity and broader national climate objectives.


© Ms. Marissa Gowrie


© Ms. Marissa Gowrie

Uganda - When Kigali spoke, Uganda answered


Mr. Isaac Mugabi

Following ratification of the Kigali. Amendment in June 2018, Uganda incorporated HFC controls into the revision of its national environmental legislation. The National Environment (Management of Ozone-Depleting Substances and Products) Regulations, 2020 support licensing and quotas, trade and customs controls, standards, labelling and refrigerant management. Implementation is reinforced through cooperation among the National Environment Management Authority, customs and standards authorities, government ministries, training institutions and industry associations. Annual training for RAC technicians, trainers and customs officers has strengthened technical and enforcement capacity.

Uganda has complemented these measures with broad and inclusive public engagement. By the end of 2025, activities had involved 150 secondary schools, 26 universities and 60 corporate entities. Initiatives include a National Ozone Contest recognizing “Mr. Ozone” and “Ms. Ozone,” and a schools championship rewarding learners in female and male categories while expanding participation to learners with disabilities. In 2026, Uganda’s National Environment Management Authority received regional recognition for its customs enforcement and inter-agency cooperation.

Uganda’s experience highlights how legal reform, enforcement, workforce development and inclusive engagement can reinforce one another in implementing the Kigali Amendment.

IV. Supporting technology transition and sustainable cooling

Implementation of the Kigali Amendment is accelerating technological change across refrigeration, air-conditioning and other hydrofluorocarbon HFC-consuming sectors. This transition involves more than replacing one refrigerant with another. Lower- GWP alternatives may require changes in equipment design, manufacturing processes, safety standards, installation and servicing practices. Decisions made during the transition can also shape the energy consumed by cooling equipment over its lifetime. Implementation of the Kigali Amendment therefore provides an important opportunity to reduce both direct emissions from refrigerants and indirect emissions associated with energy use.[10]

[10] United Nations Environment Programme (2025), Nationally Determined Contributions (NDCs) cooling guide: Guidance for integrating the cooling sector into NDCs, Paris, ISBN 978-92-807-4222-0.

Cooling is essential for health, thermal comfort, food security, medical cold chains and economic productivity, but growing demand can place additional pressure on electricity systems and increase greenhouse gas emissions. Sustainable cooling seeks to meet these needs while limiting climate impacts through lower-GWP refrigerants, efficient equipment and systems, passive cooling, improved refrigerant management and, where appropriate, renewable energy and alternative cooling technologies. Combining these approaches can extend the climate benefits of the HFC phasedown and at the same time improve energy security, resilience and access to cooling.

4.1 Moving beyond refrigerant substitution

The servicing-sector capacity and safety frameworks described in section 3.2.E provide an important foundation for technology transition.

The climate impact of cooling equipment depends on both electricity use and refrigerant emissions. The balance varies with product level of efficiency, operating hours, climate, sources of electricity generation, refrigerant type and charge, leakage issues, servicing and end-of-life practices. Coordinating the refrigerant transition with energy efficiency policies, such as minimum energy performance standards, energy labelling, and measures to reduce cooling demand can lower both direct emissions from refrigerants and indirect emissions associated with electricity consumption. Passive cooling measures, such as shading, reflective roofs, natural ventilation and improved insulation, can further reduce the need for mechanical cooling. In the urban context, trees, green spaces, cool surfaces and other nature-based solutions can reduce heat exposure. In cold chains, improved insulation, reduced heat and moisture infiltration, and better system controls can lower cooling loads and energy consumption.[11]

Lifecycle refrigerant management provides another complementary pathway. Leak prevention, refrigerant recovery, reuse, recycling and reclamation can reduce emissions from equipment already in use and limit demand for newly produced refrigerants. Refrigerants that cannot be reused should be collected and directed towards environmentally sound destruction where suitable facilities and arrangements are available. These measures are addressed in more detail in section 3.2.F.

[11] United Nations Environment Programme (2026), *National Cooling Action Plan Methodology for the MENA Region.*

Four complementary pathways to sustainable cooling

- **Lower-GWP refrigerants and appropriate technologies:** Select and design equipment that can use lower-GWP alternatives safely, efficiently and reliably under national climatic and market conditions.
- **Efficient equipment and systems:** Use minimum energy performance standards (MEPS) , energy labels, equipment standards, sustainable procurement and market incentives to remove inefficient products and increase demand for high-performance technologies.
- **Lower cooling demand:** Apply passive cooling, better building design, urban greening, insulation, shading, natural ventilation and improved cold-chain design.
- **Lifecycle refrigerant management:** Prevent leaks and support recovery, reuse, recycling, reclamation and environmentally sound end-of-life management.

Coordinated action across these four areas can reduce direct refrigerant emissions and indirect energy-related emissions while improving the reliability and accessibility of cooling services.

4.2 Accelerating energy-efficient and climate-friendly equipment

Minimum energy performance standards and energy labels are complementary tools for transforming cooling-equipment markets. MEPS prevent the sale of products that do not meet minimum efficiency requirements, while labels provide key information to help purchasers compare models and create demand for better-performing equipment. Implementing these policy instruments and regularly reviewing the requirements in line with technology advances and international best practices can progressively improve the efficiency of products available on national markets.

Beyond regulation, sustainable procurement can direct the purchasing power of public and private institutions towards cooling products that exceed minimum energy-efficiency and refrigerant GWP requirements, while financing mechanisms and business models tailored to national markets can address high upfront costs and limited access to finance.[12]

Energy-efficiency requirements, refrigerant GWP limits and related safety requirements are most effective when designed and implemented together, as part of a single, coherent framework. Aligning the requirements and timelines allows manufacturers to incorporate the necessary product redesign, testing and certification into the same production cycle.

[12] UNEP, United for Efficiency: Financial Mechanisms and Business Models: https://united4efficiency.org/resource/manual-financing-mechanisms/ and https://united4efficiency.org/resource/using-finance-to-accelerate-adoption-of-more-energy-efficient-and-climate-friendly-appliances/

UNEP's United for Efficiency (U4E) initiative supports developing countries and emerging economies in transitioning towards more energy-efficient appliances and equipment, including refrigerators, commercial refrigeration equipment, room air conditioners and heat pumps. Its Model Regulation Guidelines[13] and Sustainable Procurement Guidelines[14] provide ready-to-use templates for MEPS, energy labelling and procurement specifications, while country savings assessments[15], available for more than 150 countries, estimate the emissions, electricity and cost savings of adopting the recommended efficiency and refrigerant GWP levels.

Robust monitoring, verification and enforcement is essential for compliance with efficiency and refrigerant policies. Product registration systems can support compliance checks, market surveillance and monitoring of equipment efficiency and refrigerant use, and U4E has developed guidance and an open-source prototype system, including functions relevant to refrigerant tracking, that countries may adapt to their circumstances.[16]

Regional harmonization can reinforce national action. Harmonized policies, standards and market instruments generate economies of scale, simplify compliance requirements for governments and manufacturers, and reduce the risk of inefficient products being diverted to less-regulated markets.

Regional harmonization in practice

U4E, working with the regional energy centres — the Southern African Development Community (SADC), the Centre for Renewable Energy and Energy Efficiency (SACREEE), and the East African Centre of Excellence for Renewable Energy and Efficiency (EACREEE) —, has supported the development of regionally harmonized MEPS and energy labels for room air conditioners and residential refrigerators in the SADC and the East African Community (EAC). The standards also set limits on refrigerant GWP and ozone-depleting potential.

Southern Africa: Harmonized requirements were adopted in November 2023 and are now reflected in mandatory national regulations in Mauritius (room air conditioners, enforced since September 2025) and South Africa (amended in August 2026).

East Africa: Harmonized standards were approved in March 2025 and gazetted by the EAC Council of Ministers in July 2025, for adoption by Partner States within six months.

[13] UNEP, United for Efficiency, Model Regulation Guidelines: https://united4efficiency.org/resources/model-regulation-guidelines/
[14] UNEP, United for Efficiency, Sustainable Procurement Guidelines: https://united4efficiency.org/resources/sustainable-procurement/
[15] UNEP, United for Efficiency, Country Savings Assessment: https://csa.united4efficiency.org/
[16] UNEP United for Efficiency, Product Registration System: https://united4efficiency.org/resources/product-registration-systems/

4.3 Connecting KIPs, NCAPs and NDCs

Kigali Implementation Plans, National Cooling Action Plans and Nationally Determined Contributions serve different but complementary purposes:

- **Kigali Implementation Plans**, or KIPs, set out the measures through which Article 5 Parties plan to meet their hydrofluorocarbon HFC phasedown obligations under the Montreal Protocol.
- **National Cooling Action Plans**, or NCAPs, assess national cooling needs, demand and emissions across sectors and identify coordinated measures addressing refrigerants, energy efficiency, buildings, passive cooling, cold chains, cooling access and other national priorities.
- **Nationally Determined Contributions, or NDCs**, communicate national mitigation and adaptation commitments under the Paris Agreement.

Better coordination among these processes can help countries align baselines, targets, policy measures, responsibilities and monitoring systems. KIPs can provide information on HFC consumption, phasedown schedules, sectors and planned interventions. NCAPs can place these measures within a broader assessment of energy use, cooling demand, access and adaptation needs. Relevant measures from KIPs and NCAPs can then inform NDC targets and actions without changing the distinct legal and institutional functions and mandates under which the three instruments are developed.[17]

The Nationally Determined Contributions (NDCs) Cooling Guide: Guidance for Integrating the Cooling Sector into NDCs developed by UNEP through United for Efficiency and the NDC Cooling Working Group of the UNEP-led Cool Coalition, proposes a staged approach. It begins with available data from Article 7 reporting, KIPs, NCAPs and energy systems; establishes baselines for refrigerant-related and energy-related emissions; identifies and selects measures; and defines indicators for monitoring, reporting and verification. The guide also emphasizes inter-agency cooperation involving National Ozone Units and authorities responsible for climate, energy, buildings, health, agriculture and other sectors.[18]

NCAPs can provide the underlying evidence base for this coordination. They can assess present and future cooling demand, identify met and unmet cooling needs, compare intervention scenarios and establish sector-specific recommendations. The 2026 National Cooling Action Plan Methodology for the MENA Region also highlights their role in strengthening governance, providing market signals for investment and aligning refrigerant transition with energy efficiency, cooling access and wider development priorities. This is particularly relevant in regions with high ambient temperatures, where rapid growth in cooling demand can increase energy use and risk locking markets into inefficient, high-emission technologies.[19]

[17] United Nations Environment Programme (2025), *Nationally Determined Contributions (NDCs) cooling guide.*
[18] UNEP (2025), *NDC Cooling Guide.*
[19] United Nations Environment Programme (2026), *National Cooling Action Plan Methodology for the MENA Region.*

4.4 Sustainable cooling in national climate planning

Country experience shows that there is no single pathway for connecting cooling with national climate planning. Countries may begin with an NCAP, an NDC process, building and appliance policies, passive cooling, demand-side management or refrigerant transition.

Rwanda – Building capacity for sustainable cooling and energy-efficient refrigeration

Rwanda has emerged as a leading advocate for sustainable cooling and implementation of the Kigali Amendment. The country made efforts to strength the institutional, technical and market conditions needed to support the transition toward energy-efficient and climate-friendly cooling technologies. Through a project supported by the CCAC, the Rwanda Environment Management Authority (REMA) has worked to increase national capacity to assess and reduce HFC emissions from the cooling sector, promote the uptake of energy-efficient equipment using low-global-warming-potential refrigerants, and strengthen the enforcement of cooling-related policies and regulations. The project also supports the development of competency-based certification schemes for refrigeration and air-conditioning technicians, and outreach activities on minimum energy performance standards, energy labelling and sustainable cooling practices. By combining HFC mitigation, technician certification, energy efficiency and stakeholder engagement, Rwanda demonstrates how the implementation of the Kigali Amendment can support broader sustainable cooling objectives and green economic development.

The project also supports the implementation of Rwanda's National Cooling Strategy and demonstrates how cooling-sector actions can contribute simultaneously to climate mitigation, sustainable development and implementation of the Kigali Amendment.

Rwanda's experience illustrates how implementation of the Kigali Amendment can serve as an entry point for broader sustainable cooling action by linking refrigerant transitions, energy efficiency, skills development and institutional capacity-building.

Other countries have pursued different pathways to integrate cooling within climate and development planning, reflecting national circumstances and priorities. The examples below highlight how these different entry points can bring HFC phasedown together with energy efficiency, cooling access, resilience and wider climate objectives.[20]

Sustainable cooling in practice

Nigeria: The National Cooling Action Plan provided a framework for integrating cooling into national climate planning, bringing together building codes and appliance efficiency, HFC phasedown and potential off-grid renewable-energy solutions for cooling. Clearer responsibilities across ministries and agencies supported a more coordinated approach.

[20] *United Nations Environment Programme (2025), Nationally Determined Contributions (NDCs) cooling guide.*

Ghana: Data from the National Cooling Action Plan informed the integration of cooling targets into the country's NDC. Coordination among climate, energy and ozone authorities helped connect equipment efficiency with the transition to lower-GWP refrigerants.

Cambodia: Cooling-related climate action includes passive cooling measures for cities, public buildings and commercial buildings. These measures include building retrofits and passive-cooling performance requirements under the national building-energy framework, linking reduced cooling demand with climate mitigation and adaptation.

Grenada: National cooling planning has linked building-performance improvements and efficient RAC equipment with technician capacity, refrigerant recovery and recycling, and the transition towards climate-friendly refrigerants. These measures have informed the integration of cooling within the country's climate planning.

United Arab Emirates: Cooling is incorporated across national demand-side management, building-efficiency policies and climate planning. The country's approach includes efficient air conditioning, district cooling, improved building codes and measures supporting lower-GWP refrigerants, reflecting the importance of integrated cooling policy in a high-ambient-temperature country.

Source: United Nations Environment Programme (2025). Nationally Determined Contributions (NDCs) Cooling Guide: Guidance for Integrating the Cooling Sector into NDCs. Developed with contributions from UNEP United for Efficiency and the NDC Cooling Working Group of the UNEP-led Cool Coalition. https://wedocs.unep.org/20.500.11822/47901. For Grenada, see also Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2025). Grenada NDC Cooling Implementation Roadmap 2025–2030. Developed under the Cool Contributions fighting Climate Change project in collaboration with Grenada's National Ozone Unit.

4.5 Growing international momentum

The Global Cooling Pledge, launched at the UN Climate Change COP28 in Dubai, in December 2023, has added political momentum to efforts to reduce cooling-related emissions, improve cooling efficiency and expand access to sustainable cooling. The Pledge aims to support a global reduction in cooling-related emissions of at least 68 per cent relative to 2022 levels by 2050, and to increase the global average efficiency of new air conditioners by 50 per cent by 2030.[21]

Implementation is increasingly being supported through mechanisms that connect national policy with subnational action, market transformation and technical assistance, including the Intergovernmental Committee on Cooling, Beat the Heat, and the Enabling Pledge Implementation for Cooling platform.

[21] UNEP Cool Coalition (2025), *Annual Global Cooling Pledge Progress Report*.

As of August 2026, the Pledge had 76 national signatories, of which 57 were Article 5 Parties. Fifty signatories had published NDCs reflecting cooling, while 25 had published a National Cooling Action Plan (NCAP), or equivalent plan. Two more were working towards publication, and five had submitted formal requests to begin developing NCAPs. The 2025 progress report also found growing use of MEPS, energy labels, building codes, low-GWP requirements and sustainable procurement policies, although countries continued to report financial, technical, regulatory and market barriers.[22]

Another important development in 2026 was the launch of the renewed Friends of the Kigali Amendment, on 23 September, during the United Nations General Assembly and Climate Week NYC[23]. Led by Rwanda, together with Brazil and the United Kingdom, the initiative revives the high-level political coalition that helped build support for the Kigali Amendment and seeks to accelerate implementation over the coming decade. Through a Ministerial Communiqué, participating governments reaffirmed four priorities: achieving universal ratification of the Kigali Amendment; accelerating implementation through sustainable cooling, energy efficiency and lifecycle refrigerant management; strengthening access to finance, technology and capacity-building support; and deepening cooperation with the industry to expand access to affordable and sustainable cooling solutions. The launch also highlighted a new philanthropic effort with a US$100 million fundraising goal to support accelerated action. The renewed Friends initiative helps maintain political momentum as Parties prepare for the tenth anniversary of the Kigali Amendment, the Thirty-Eighth Meeting of the Parties (MOP38), in Kigali, in November 2026, and the Thirty-First Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), in Antalya, in November 2026, while reinforcing the contribution of the HFC phasedown and sustainable cooling to global climate objectives.

International cooperation can support countries in addressing these barriers. The Cool Coalition convenes over 300 governments, cities, businesses, financial institutions, technical partners and other stakeholders to accelerate sustainable cooling and heat resilience through policy, implementation, finance, knowledge and collective action. United for Efficiency (U4E) provides policy and technical resources for efficient equipment and market transformation. The Climate and Clean Air Coalition (CCAC)[24] supports approaches addressing HFCs, energy efficiency, lifecycle refrigerant management and equitable cooling access. The Montreal Protocol institutions and Multilateral Fund provide the regulatory, financial and implementation framework for the HFC phasedown in Article 5 Parties. Together, these complementary forms of support can help countries translate refrigerant commitments into broader transformation of the cooling sector.[25]

By connecting HFC phasedown with equipment efficiency, passive cooling, lifecycle refrigerant management and national climate planning, countries can extend the benefits of the Kigali Amendment beyond refrigerant substitution. This integrated approach can reduce emissions, limit pressure on energy systems, strengthen resilience to extreme heat and improve access to essential cooling services.

[23] For more information https://www.ccacoalition.org/content/friends-kigali-amendment

[24] For more information on hydrofluorocarbons and the work of the Climate and Clean Air Coalition, see: https://www.ccacoalition.org/short-lived-climate-pollutants/hydrofluorocarbons-hfcs.

[25] UNEP Cool Coalition (2025), Annual Global Cooling Pledge Progress Report. The report notes that figures reflect the 2025 reporting cycle and may be revised as monitoring systems and country submissions evolve.

V. The next decade: Expanding the HFC transition

The first decade of the Kigali Amendment has laid important foundations for implementation. Article 5 countries have established and strengthened regulatory frameworks, licensing and quota systems, national implementation plans and institutional and technical capacity, while investment in lower-GWP technologies and sustainable cooling has accelerated. The next decade will require countries to build on these foundations as the HFC phasedown enters successive reduction stages.

For many Article 5 Parties, the transition will increasingly move from establishing systems and stabilizing HFC consumption towards achieving successive reduction targets. At the same time, growing cooling demand, evolving technologies and refrigerant markets, and the need to maintain effective compliance and enforcement will require sustained financial, institutional and technical support.

5.1 Moving towards deeper HFC reductions

The next decade will bring important milestones under the Kigali Amendment. Article 5 Group 2 Parties will reach their HFC consumption freeze in 2028, while the majority of Article 5 Parties will take their first reduction step—10 per cent below their baseline—in 2029. Further reductions will follow over the subsequent decades, ultimately bringing HFC consumption to 20 per cent of baseline for Article 5 Group 1 Parties by 2045, and 15 per cent for Article 5 Group 2 Parties by 2047.

As these control measures become progressively more stringent, implementation will need to move beyond initial readiness measures towards deeper and sustained reductions across HFC-consuming sectors. This will require countries to continuously assess consumption patterns, prioritize sectors and technologies, strengthen national policy measures and ensure that implementation remains aligned with their respective control schedules.

For Article 5 Parties, stage II and subsequent stages of Kigali Implementation Plans will provide an important framework for planning these deeper reductions, building on the regulatory, institutional and technical foundations established during earlier stages of implementation.

5.2 Accelerating technology and servicing-sector transformation

Achieving deeper HFC reductions will depend increasingly on the availability, accessibility and safe adoption of lower-GWP technologies. The suitability of alternatives varies across applications and national circumstances, including climatic conditions, market structure, infrastructure, safety requirements and technical capacity. Continued innovation and technology transfer will therefore remain essential.

The transition also requires sustained transformation of the RAC servicing sector. As new refrigerants and technologies enter national markets, technicians need appropriate training, certification, tools and knowledge of relevant safety standards and good servicing practices. Strengthening technical and vocational education and maintaining a skilled servicing workforce will be critical to ensure that alternative technologies can be safely installed, operated and maintained over their lifetime.

Where equipment is replaced or redesigned, countries can also capture additional climate benefits by integrating energy-efficiency improvements into the refrigerant transition. Maintaining this link between HFC phasedown and energy efficiency will become increasingly important as global demand for cooling continues to grow.

5.3 Moving towards lifecycle refrigerant management

As countries advance with their implementation, greater attention will also be needed to the management of refrigerants throughout their lifecycle. Reducing demand for high-GWP HFCs addresses one part of their climate impact; preventing avoidable emissions from refrigerants already contained in equipment and products provides an additional opportunity.

Measures such as leak prevention, recovery, recycling and reclamation can help reduce emissions while supporting more efficient use of available refrigerants. Collection and environmentally sound end-of-life management can further strengthen the environmental sustainability of the transition. Developing the necessary policies, infrastructure, technical capacity and market incentives for lifecycle refrigerant management will therefore become an increasingly important complement to the HFC phasedown.

5.4 Strengthening compliance, monitoring and enforcement

Deeper reductions will also place increasing demands on national control systems. As HFC quotas tighten and differences in regulatory requirements and market conditions persist across countries, effective licensing, quota management, data reporting, customs controls and enforcement will remain essential for maintaining compliance.

Particular attention will need to be placed on strengthening the coordination between National Ozone Units, customs administrations and other relevant authorities; improving digital licensing and data exchange; strengthening the identification and classification of controlled substances and mixtures; and addressing emerging patterns of illegal and informal trade. Cooperation among Parties and relevant international and regional organizations will remain important for monitoring transboundary movements and responding to illegal trade risks.

5.5 Sustaining finance, capacity and international cooperation

The transition required over the coming decades cannot be achieved through technology change alone. Sustained financial and technical assistance will remain essential for Article 5 Parties as they move towards deeper reduction targets and address increasingly complex sectoral transitions.

The Multilateral Fund will continue to play a central role in supporting the implementation of the Kigali Amendment, including through KIPs, institutional strengthening, investment activities, capacity building and support for energy efficiency, while phasing down HFCs. UNEP OzonAction's Compliance Assistance Programme, together with the other implementing and bilateral agencies, the Ozone Secretariat, the Multilateral Fund Secretariat and other partners, will continue to support countries in strengthening institutions, sharing experience, addressing emerging challenges and sustaining compliance.

Continued cooperation with the industry, technical institutions, standards bodies, customs authorities, civil society and other stakeholders will also be important as the transition reaches deeper into national economies and cooling systems.

Looking ahead

Ten years after its adoption, the Kigali Amendment has moved from negotiation to implementation and from initial readiness to concrete action. The foundations for the global HFC phasedown are increasingly in place. The challenge of the next decade will be to build on those foundations and deliver progressively deeper and sustained reductions while ensuring that the transition is technologically feasible, economically viable and environmentally sound.

Success will depend on maintaining the combination that has characterized the Montreal Protocol for nearly four decades: **clear and progressively strengthened commitments, sustained financial and technical support, effective national institutions, technological innovation and international cooperation.** By maintaining this momentum, implementation of the Kigali Amendment can deliver its full climate benefits while contributing to a more sustainable and efficient cooling future.



UN Environment Programme is an Implementing Agency of the Multilateral Fund for the Implementation of the Montreal Protocol. OzonAction is part of UN Environment Programme's Law Division and serves 147 developing countries through the Compliance Assistance Programme.

UNEP – Law Division
OzonAction
Building VII
1, rue Miollis
75015 Paris, France
unep-ozonaction@un.org

Available online at www.unep.org/ozonaction
Author: Marta Pizano

UN environment programme

OzonAction
COMPLIANCE ASSISTANCE PROGRAMME