environmental investigation agency

EIA Briefing to the 48th Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol, 13-17 July 2026

REPLENISHED FUNDING, RENEWED AMBITION

Meeting the Climate Crisis Head-On

ABOUT EIA

We investigate and campaign against environmental crime and abuse. For over three decades, EIA has exposed transnational wildlife crime with a focus on elephants and rhinos, and forest crimes such as illegal logging and deforestation for agricultural commodities.
We reduce the impact of climate change by campaigning to eliminate powerful greenhouse gases and improve energy efficiency in the cooling sector, and exposing related illicit trade.
We use our findings to campaign for new legislation, improved governance, and more effective enforcement.

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INTRODUCTION

This year, 2026, marks an important milestone for the Montreal Protocol. In October, Parties will celebrate the 10-year anniversary of the Kigali Amendment, the moment which saw the ozone treaty turn decisively to face the climate threat posed by hydrofluorocarbons (HFCs). As we approach the Kigali celebrations, the 48th meeting of the Open-Ended Working Group (OEWG48) offers the global community an opportunity to reflect on this successful example of multilateral environmental cooperation, as well as challenges that remain.

OEWG48 takes place amid a challenging global backdrop marked by economic uncertainty, energy market volatility, fiscal pressures and intensifying climate impacts. These circumstances have increased the implementation challenges faced by many Article 5 (A5) Parties, now approaching the final stages of their HCFC phase-outs, while also facing the first HFC phase-down step in just three years' time, all while balancing multiple development priorities. At the same time, the growing necessity of climate resilience, which requires both sustainable cooling and improvements in energy efficiency, is further reinforcing the strategic importance of the Kigali Amendment and the broader objectives of the Montreal Protocol.

As Parties consider the range of issues before them, continued investment in and support for the Multilateral Fund (MLF) will remain essential. Since its inception, the MLF has been the cornerstone of the Protocol's success, enabling A5 Parties to meet their obligations through predictable financial support, technology transfer and capacity building. Ensuring that the MLF remains adequately resourced and responsive to evolving and expanding implementation needs will be critical to sustaining momentum under the Kigali Amendment and preserving the Protocol's record of delivering equitable and effective global action.

Swift and decisive action is also critical to protect the ozone layer's recovery from new and emerging threats. The risks posed by previously underestimated feedstock and other production emissions, alongside accelerating emissions of nitrous oxide (N_2O)– the most significant ozone-depleting substance in the world today–underscore the necessity of continued vigilance and committed action. The enduring strength of this treaty is that it evolves with the science, confronting new risks as they emerge and adapting governance for robust ozone and climate protection.

With universal ratification of the Kigali Amendment in reach, it is vital that the Montreal Protocol community comes together once again, to renew their collective ambition and demonstrate the commitment which has made this the most successful environmental treaty. The anniversary year provides an important moment not only to celebrate achievements but also to renew collective ambition and commitment to full and effective implementation.

This briefing outlines the Environmental Investigation Agency's analysis and recommendations on agenda items to be discussed at OEWG48.

AGENDA ITEM 3:
Report of the Technology and Economic Assessment Panel on the 2027–2029 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (Decision XXXVII/6)

For more than three decades, the MLF has been the engine behind the Montreal Protocol's success. As of ExCom97 (December 2025), the MLF had authorised US$4.38 billion (including support costs) since its inception, delivering a total of 10,363 projects across 144 A5 Parties. This assistance makes certain that knowledge and technology transfer is optimised in A5 Parties in an efficient and cost-effective manner.

This year's replenishment negotiations come at a pivotal moment, with most A5 Parties now simultaneously completing the phase-out of HCFCs while facing the first reduction step in HFC consumption by 2029. This overlap creates significant challenges, but also presents opportunities to synergise HCFC Phase-out Management Plans (HPMPs) and Kigali Implementation Plans (KIPs) to accelerate the move away from fluorochemicals in favour of ultra-low-GWP, natural refrigerants.

The Technology and Economic Assessment Panel (TEAP) Replenishment Task Force (RTF) estimates a total funding requirement for the 2027-2029 triennium to be from a low-end range of US$1.28-1.36 billion to a high-end range of US$1.67-1.76 billion. This funding is intended to support the completion of the ozone-depleting substances (ODS) phase-out (namely HCFCs) and the implementation of Stage I and Stage II HFC phase-down activities. It also factors in ongoing Institutional Strengthening (IS) and Standard Activities (SA), such as the Compliance Assistance Programme (CAP), Implementing Agency costs and the MLF Secretariat costs.

Difference between the low-end and high-end ranges

With respect to HCFCs, the low-end range was based on historical cost-effectiveness (CE) thresholds (HCFC Scenario 1), while the CE thresholds agreed in the cost guidelines were used to calculate the high-end range (HCFC Scenario 2).

With respect to HFCs however, the low- and high-end ranges are more complex. Assuming full Kigali ratification by 2029, RTF proposes two funding level scenarios – HFC scenario 1 uses CE thresholds from the cost guidelines for all enterprises, while HFC scenario 2 includes higher CE thresholds approved by Decision 95/86 for small- and medium-sized enterprises (SMEs) in the refrigeration and air conditioning (RAC) (32%) and polyurethane (PU) foam (40%) sectors. TEAP calculates total funding required to achieve Stage I and Stage II KIPs to be US$2.19 million under Scenario 1 and US$2.26 million in Scenario 2.[1] EIA urges that the Parties consider only HFC scenario 2, given that higher SME costs are part of the decisions agreed by the Executive Committee of the Multilateral Fund (ExCom) which will impact expenditure during 2027-29, as per the Terms of Reference (TOR) for the TEAP study.[2]

The two HFC scenarios are then split further, according to two different resource allocation schedules. Focusing on costs for the next triennium (i.e. 2027-29), the high-end range is based on Resource Allocation Schedule 'A', which assumes that all Group 1 Parties will agree KIPs during the next triennium and a large proportion (60% of Group 1 Parties that currently have KIPs) will also implement Stage II KIPs in 2027-29. Schedule A also assumes that 60% of Group 2 Parties will receive funding for Stage I of their KIPs in the next triennium.[3] In total, HFC costs for 2027-29 are US$853 million for HFC scenario 1 and US$876 million for HFC scenario 2.

Resource Allocation B pushes all Stage II KIPs to the 2030-32 triennium and beyond. It also assumes no

Table 1
TEAP Replenishment Report Table 11.1: Range of total funding requirement for the replenishment of the MLF 2027-2029 based on different scenarios and resource allocation schedules, and IS and SA (US$ million)

2027-2029 Triennium	Low-end Range	High-end Range
SUBTOTAL - HCFC ACTIVITIES	451	573
SUBTOTAL - HFC ACTIVITIES	702 - 781	970 - 1,053
SUBTOTAL - IS & SA	129	129
GRAND TOTAL	**1,282 - 1,361**	**1,672 - 1,755**

Table 2
TEAP Replenishment Report Table 11.2: Estimated funding requirement for HCFC phase-out for 2027-29 (US$ million)

Triennium	Sector	HCFC Estimated Funding Range	
		HCFC Scenario 1	HCFC Scenario 2
2027-2029	HCFC Consumption sector with scenarios and resource allocations	427.56	549.44
	HCFC Production sector	23.54	23.54
	TOTAL HCFC RANGE	**451.10**	**572.98**

Table 3
TEAP Replenishment Report Table 11.3: Estimated total funding requirement for HFC phase-down for 2027-2029 (US$ million)

Triennium	Sector	HFC Estimated Funding Range	
		Resource Allocation A	Resource Allocation B
2027-2029	HFC Consumption sector with scenarios and resource allocations	958 - 1,042	690 - 769
	HFC Production sector and HFC-23 mitigation	11.76	11.76
	TOTAL HFC RANGE	**970 - 1,053**	**702 - 781**

funding at all for Group 2 Parties during 2027-29, thus there is a much lower proportion of KIP-related costs entailed in 2027-29 (US$585.5 million and US$603.3 million for HFC scenarios 1 and 2).

Given that the actions and agreements of the ExCom to date have been to urge A5 Parties to accelerate beyond the agreed compliance measures, and that the next control measure for Group 1 Parties of 30% in 2035 will be much more challenging, compared to the 10% reduction in 2029, it is entirely unrealistic to delay all funding for Stage II KIPs until the next decade. Similarly, the low-end Schedule B scenario leaves Group 2 Parties with no funding to address the 2028 freeze. Already one Group 2 Party (Oman) has submitted a KIP proposal to the ExCom, which aims to proactively avoid HFC growth in advance of the freeze and has already been deferred twice.[4] EIA therefore urges Parties to consider only the high-end costs of HFCs in the summary tables.

There are a number of other elements of the TEAP calculations that serve to underestimate the costs of the replenishment, including:

- The additional costs of project management units were not included for HCFCs or HFCs. The RTF, based on consultations with the MLF, suggests that these costs could be 5, 6 or 10% depending on the party in question.
- A 15% deduction was applied to account for ineligible foreign ownership in the manufacturing sectors.
- The RTF notes that the 3% salary increase it applied for IS and SA is considered by them to be inadequate.
- The HCFC scenarios did not include the additional 25% for low-GWP alternatives (per Decision 74/50) or the 40% additional funding for foam SMEs, even though these sectors are involved in the final stages of the HCFC phase-out.
- There is no provision to increase IS funding, even though this funding provides essential core capacity building and only represents 5% of the total funds approved. A5 countries have taken on significant additional responsibilities and the next triennium will be much more challenging. A scenario with increased IS costs should be included.
- For energy efficiency costs, the low-end estimate entirely excludes any expenditure related to the energy efficiency revolving fund under ExCom Decision 95/87, which is unrealistic.
- No funding is included for implementation of national plans for the collection, transport and disposal of used or unwanted controlled substances prepared under ExCom Decision 91/66, even though the ExCom will consider the establishment of a funding window to

implement such plans at the 100th meeting, according to ExCom Decision 97/89.[5]

- The RTF notes the need to bridge the gap between existing funding and the requirements for comprehensive lifecycle refrigerant management (LRM) including institutional support and infrastructure. Its report outlines a range of costs associated with LRM which are not included in the overall estimate.
- No funding is included for the integration of digital technologies and tools within the servicing sector as requested in the TOR, even though the report summarizes average estimated costs in Tables 9.1 and 9.2.
- The challenges faced by LVCs are not specifically considered, even though they are recognised in multiple ExCom documents.[6]

EIA recommends that these costs are included in the RTF supplementary report, and that the Resource Allocation B scenario is revised to include all Group 1 Stage I KIPs, 40% of Group 1 Stage II KIPs and 40% of Group 2 Stage I KIPs in the 2027-29 triennium (see Table 4).

...continued investment in regional atmospheric monitoring and regular, transparent updates to bank inventories is needed to avoid underestimating future emissions and missing opportunities to recover and manage existing banks.

Table 4
EIA recommendation for revised Resource Allocation Schedule B

Group	KIP Stage	Schedule A (% per triennium)	Schedule B (% per triennium)	EIA recommended revision to Schedule B
Group 1 Parties without KIPs	I	100% - 2027-29	90% - 2027-29 10% - 2030-32	100% - 2027-29
	II	60% - 2030-32 40% - 2033-35	60% - 2030-32 40% - 2033-35	-
Group 1 Parties with KIPs (83 Parties)	II	60% - 2027-29 40% - 2030-32	60% - 2030-32 40% - 2033-35	40% - 2027-29 60% - 2030-32
Group 2 Parties	I	60% - 2027-29 40% - 2030-32	90% - 2030-32 10% - 2033-35	40% - 2027-29 60% - 2030-32

AGENDA ITEM 4: Presentations by the Technology and Economic Assessment Panel on its 2026 progress report

4(a) Halon 1301 and its continuing use in the aviation industry; management of other controlled substances used for fire suppression

Halons are powerful ozone depleting substances and strong climate forcers. Halon 1301, for example, has an ODP of 17 and a GWP_{100} of 7,430.[7] Production and consumption of halons have been phased out; therefore, continued critical uses in fire suppression rely on existing banks or recovered, reclaimed or recycled material.

The 2026 Fire Suppression Technical Options Committee (FSTOC) Progress Report highlights ongoing concerns around the long-term supply of halon 1301, for which the FSTOC now estimates a runout date of 2031-2039, and concerns about the lack of suitable non-HFC alternatives for use in civil aviation.

Following Decision XXXVII/4 and International Civil Aviation Organization (ICAO) Resolution A42-11, FSTOC and the Ozone Secretariat have been liaising with ICAO and its technical bodies on issues relating to halon banks and future demand for and alternatives to halons in civil aviation.[8] Civil aviation representatives have stated intention to request an Essential Use Nomination (EUN) for long-term halon 1301 supply.[9] The FSTOC report suggests this could lock in more than 60 years of halon 1301 use and emissions by continuing to allow the installation of halon systems in new models of aircraft.[10]

EIA firmly disagrees with the suggestion from FSTOC that Parties consider changes to the EUN evaluation process at this time. Rather, given the rapidly developing situation and the ozone and climate impacts that would result from additional halon use, it is essential that FSTOC have the most accurate and up to date information on future halon demand and alternatives, but also on the size and management of existing banks. EIA therefore urges Parties to further investigate these issues and to share all relevant information with FSTOC as soon as possible. It is of utmost importance that all Parties ensure appropriate measures are in place to support the sustainably financed recovery, recycling and reclamation of halons, and to prevent further destruction of halon banks for carbon credits, or loss by other means (e.g. thefts or venting).[11]

Valuable insights into halon banks, management and emissions can be provided via regional atmospheric monitoring studies. This is demonstrated by the recent study from Choi et al., which provides evidence of significant issues relating to halon 2402 management and reporting.[12] Global emissions of halon 2402 (ODP 15.6; GWP_{100} 2,260)[13] have been increasing since 2015, primarily driven by emissions from East Asia, in particular Japan and the Vladivostok region of Russia. Regional monitoring studies of this kind can also be used to locate emissions hotspots and identify potential sources. While it appears that elevated halon 2402 emissions in East Asia are related to existing banks rather than illegal production, the scale of emissions that have occurred suggests that banks are being depleted more rapidly than had been previously estimated. The study also suggests there may be inaccuracies in reported size of existing banks. This highlights the need for continued investment in regional atmospheric monitoring and regular and transparent updates to bank inventories, without which Parties risk underestimating future emissions and missing opportunities to recover and manage existing banks.

Regional scale monitoring would be particularly useful for halon 1301 as it could shed light on both management of fire suppression systems and emissions relating to feedstock use. The latter is very important given that FSTOC have only been able to reconcile their bottom-up estimates with global halon 1301 emissions by assuming a feedstock emission factor of 26% relative to production, which is substantially higher than for other feedstocks.[14]

EIA therefore welcomes the inclusion of some initial regional monitoring data in the FSTOC Progress report and recommends that Parties request that FSTOC work with the Scientific Assessment Panel (SAP) to provide and interpret further information on top-down and bottom-up halon emissions, with SAP providing up to date regional emissions data and maps where possible.

4(e): Any other issues

Lifecycle Refrigerant Management (LRM), Destruction and Carbon Offsetting

LRM is a critical framework for minimising emissions of ODS and HFCs throughout their use and at end-of-life. LRM encompasses leak prevention, recovery, recycling, reclamation and destruction, all of which are necessary to ensure these potent greenhouse gases are contained and responsibly managed. In the TEAP's May 2026 Progress Report, the FSTOC has similarly emphasised the importance of Agent Lifecycle Management (ALM) for fire suppression agents, a framework which aligns closely with LRM in addressing the environmental threats posed by controlled substances.

Recognising that both frameworks are essential to upholding the Montreal Protocol's legacy and delivering the greatest possible climate benefits, EIA is deeply troubled by the increasing prominence of carbon credits and offsetting in discussions around their financing.

In the May 2026 Progress Report, the FSTOC noted its concern that Verra's newly approved methodology (VM0016) for the destruction of HFCs could incentivise destruction over reclamation, potentially undermining the availability of these agents for critical uses. EIA shares this concern, noting further that any profit-making based on the destruction of gases which can still be permissibly produced risks creating perverse incentives and/or disincentivising environmentally preferable outcomes. Notably, it was the perverse incentive to over-produce HFC-23 by-product under the Clean Development Mechanism (CDM) in the 2010s that led to the withdrawal of HFC-23 destruction credits and a significant loss of trust in offsetting as a viable climate financing approach.[15]

Ultimately, EIA believes that carbon offsetting is a flawed concept that does not deliver genuine climate benefits but rather undermines real mitigation. Both voluntary and compliance carbon markets suffer from intractable issues of additionality, permanence, leakage and double-counting; issues which compromise environmental integrity and risk damaging the Montreal Protocol's legacy if they are incorporated into its financing regime. These issues, which define the unsuitability of carbon offsetting as a financing model for LRM, are explored at length in EIA UK's recent position paper on carbon credits and offsetting.[16]

As an LRM component, it is the management of ODS and HFC banks that has drawn the greatest attention from carbon market project developers to date, with the question of how to finance bank collection, and disposal or reclamation, posing a longstanding challenge.

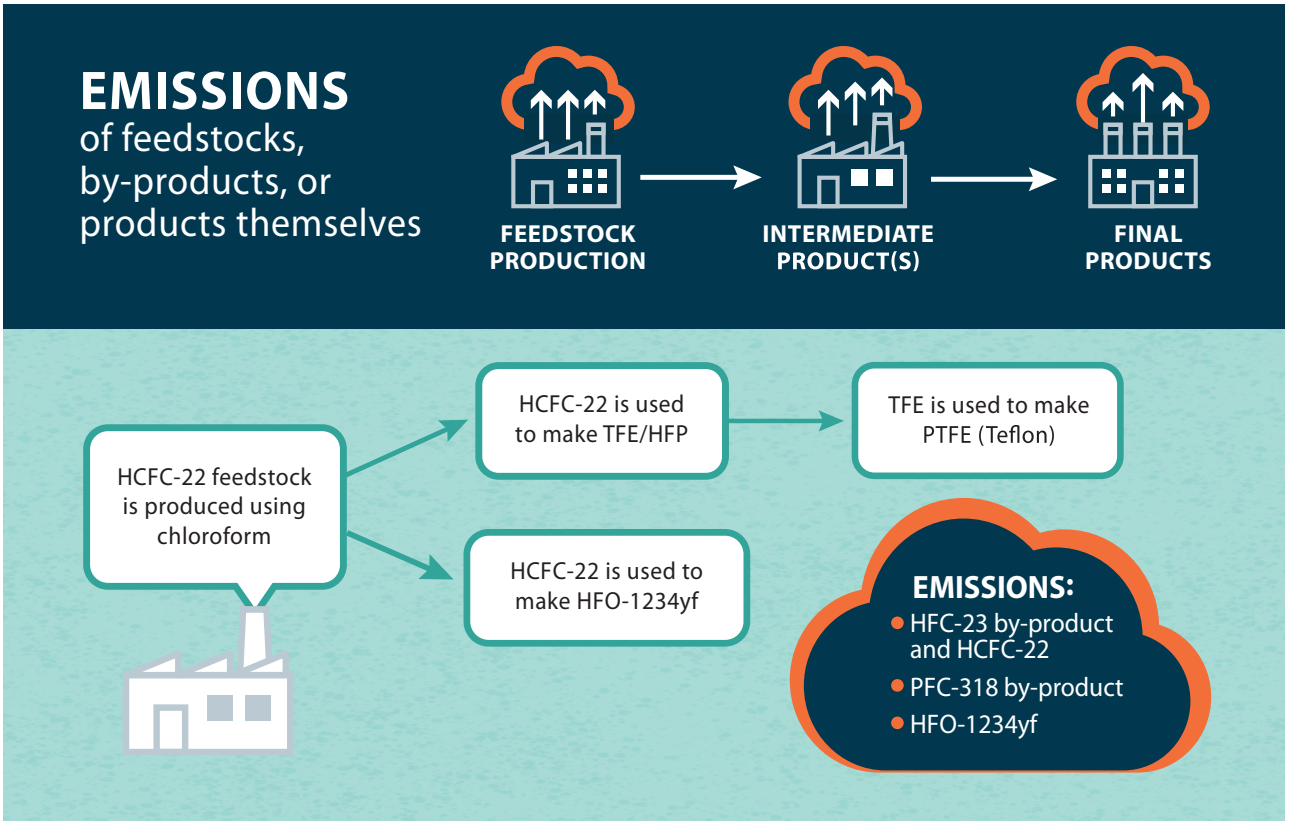
In this context, EIA welcomes Canada's submission to the TEAP of its steam plasma arc destruction technology (and the TEAP's recommendation for its approval for use by the Parties), while also noting that this innovation highlights a significant disparity in technological and financial capacity between, and even within different countries. In particular, many A5 Parties, especially LVCs and VLVCs, lack access to destruction facilities or the resources to establish comprehensive bank management systems, despite the urgent need to prevent the release of an estimated 1.5 $GtCO_2e$ annually from global banks.[17]

EIA's recent, independently authored paper, 'Evaluating Options for Sustainably Financed Action on ODS and HFC Banks', provides a comprehensive assessment of sustainable financing mechanisms for ODS and HFC bank management, exploring multilateral and bilateral funding, domestic financing options such as taxes and levies, and extended producer responsibility (EPR). The paper also discusses the limitations of carbon markets, concluding that they should play no role in financing bank management, instead advocating for robust, predictable funding through multilateral, bilateral and national sources.[18]

EIA urges Parties to ensure that MLF funding is made available to support the implementation of the bank management plans being developed under the previous MLF funding window (opened under ExCom Decision 91/66).[19] This is something that the ExCom was requested to consider by the 35th Meeting of the Parties (MOP35) in 2023 (Decision XXXV/11), and which must be reflected in the 2027-29 MLF replenishment.[20] Without support, the window of opportunity to act on banks will continue to close, and a significant opportunity to protect the climate and ozone layer will be lost.

Feedstock use of controlled substances

ODS and HFCs used as feedstocks are controlled substances under the Montreal Protocol but are exempt from production or consumption controls. While other applications of ODS have been, or are being, phased out, the feedstock exemption has allowed production for feedstock uses to grow significantly. Between 2000-2024 reported feedstock production grew by 163%, from 744 kt to almost 2000 kt.[21] As a result of the huge growth in feedstock production, the total mass of ODS produced (for controlled and feedstock purposes) was higher in 2024 than it was 30 years before,[22] despite the



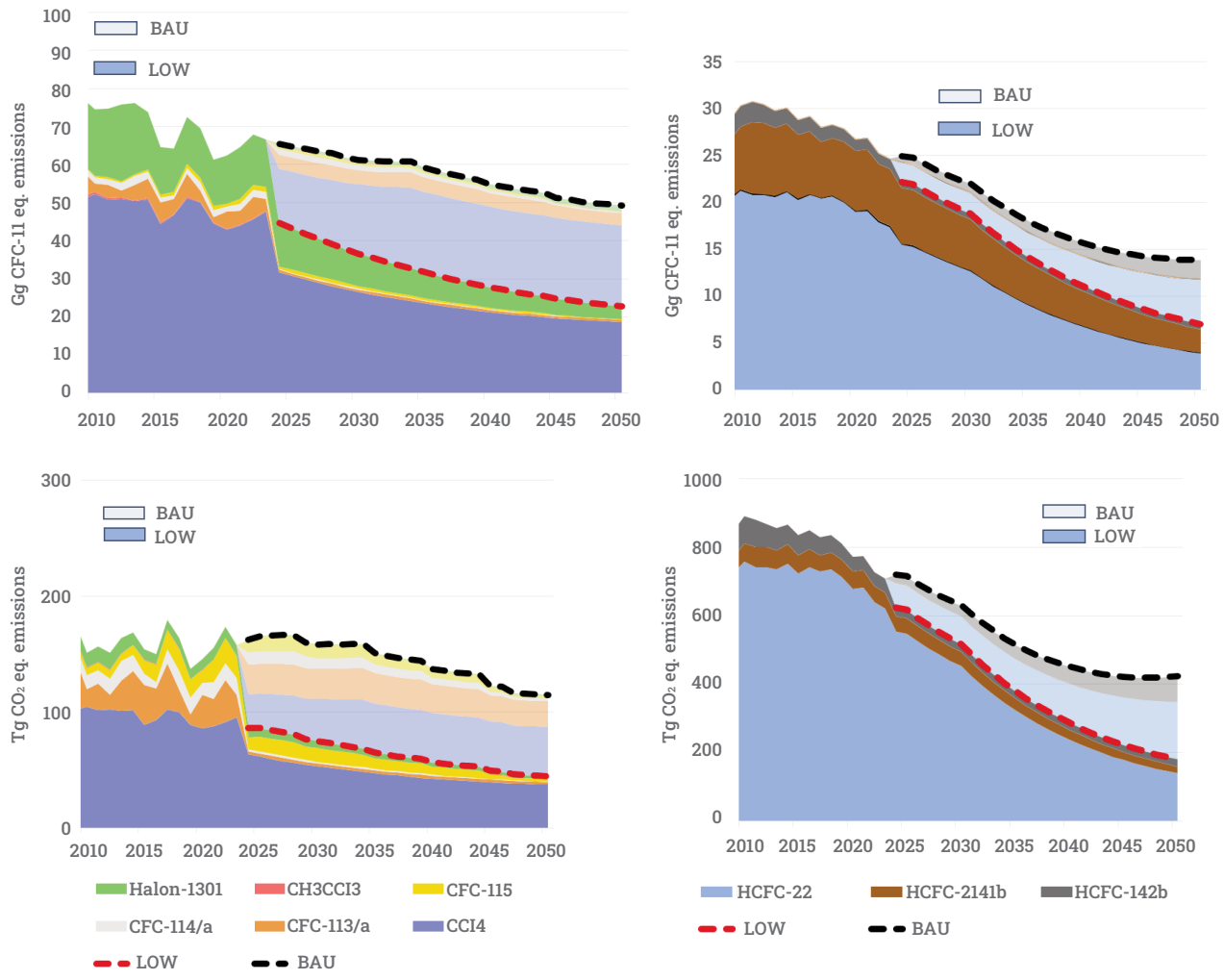
Source: EIA (2023) F-Gases at the Fenceline: Exposing the Fluorochemical Production Sector's Undisclosed Emissions. Available here

Fluorochemical production involves multiple chemical processing steps, each with the potential to produce various emissions and by-products. For example, the production of PTFE and HFOs using HCFC-22 as a feedstock results in significant high-GWP by-product emissions, including HFC-23 and PFC-318.

significant decreases in controlled ODS production and the funding that has been issued through the MLF to achieve them.

As feedstock production has grown, so has the body of evidence demonstrating that the associated emissions are not, in fact, insignificant as was initially assumed.[23] Estimated ODS feedstock emissions reached 88 Gg (33 Gg CFC-11 eq or 217 Tg CO_2 eq) in 2024.[24] For context, 217 Tg CO_2 eq is roughly equivalent to the total emissions of Spain and Andorra in 2024.[25] On top of this, there are also emissions associated with HFC feedstock use, and emissions of high GWP by-products stemming from feedstock production, such as the significant amounts of HFC-23 known to be emitted from HCFC-22 feedstock production.[26]

The evidence is clear: feedstock use of controlled substances leads to emissions on a scale that is of relevance to both climate change and ozone layer recovery. It is incumbent on the Montreal Protocol to heed the science and take action to address feedstock emissions.



Source: Reimann et al. (2026) Supplementary information for "Continuing industrial emissions are delaying the recovery of the stratospheric ozone layer". Nature communications. Available here

Combined LOW and business-as-usual (BAU) scenario emissions for ODS used as feedstocks. BAU assumes an emission rate of 3.6% relative to production for feedstocks except CCl_4 (4.3%); LOW assumes 0.5% for all feedstocks from 2024 onward and includes emissions from banks and other uses. The red and black dotted lines show total LOW and BAU emissions, respectively. Top panels: influence on stratospheric ozone (Gg CFC-11 eq.); bottom panels: influence on climate (Tg CO_2 eq.).

In a recent study, Reimann et al. show that feedstock emissions will likely grow in coming decades, due to increasing demand for products like fluoropolymers and HFOs.[27] The study found that without action, emissions from ODS feedstock use could delay ozone layer recovery by 7 (6-11) years compared to a low emissions scenario where feedstock emissions were 0.5% relative to production.

The evidence is clear: feedstock use of controlled substances leads to emissions on a scale that is of relevance to both climate change and ozone layer recovery. It is incumbent on the Montreal Protocol to heed the science and take action to address feedstock emissions. As a first step, Parties must require improved transparency and increased granular reporting on feedstock use, along with enhanced verification of reported data, to inform future decisions.

Per- and polyfluoroalkyl substances (PFAS)

The 2026 TEAP Progress Report once again includes a chapter focusing on per- and polyfluoroalkyl substances (PFAS). The TEAP focuses on what it sees as the negative consequences of emerging PFAS restrictions, but fails to acknowledge the serious and legitimate concerns around PFAS pollution among scientists and regulators that are driving these restrictions.

PFAS are substances that contain at least one fully fluorinated carbon atom (CF_3 or CF_2) without any hydrogen, chlorine, bromine or iodine atoms attached.[28] A common feature of PFAS is that they are persistent or their degradation products are persistent.[29] It is this persistence that has led to them being referred to as 'forever chemicals', because once they are emitted, they remain in the environment for a very long time. PFAS are a broad group of chemicals, and their other hazardous properties vary. However, high persistence is a fundamental problem because it means that a substance gradually builds up in the environment over time, making negative effects increasingly likely, and is hard to remove once a negative effect is discovered.[30]

Of particular relevance to the Montreal Protocol is the ultra-short chain PFAS, trifluoroacetic acid (TFA). Thanks to human activity, TFA is now found in growing concentrations in our food, bodies, water and in remote regions like the Arctic.[31] Two recently published studies have shown that fluorinated gases, including HCFCs, HFCs and HFOs, are a major contributor to environmental TFA.[32] Many HFOs,[33] and other new fluorinated gases that contain a CF_3 group (e.g. the fire suppression agent FK-5-1-12),[34] form TFA when they break down in the atmosphere. The particularly high yield of TFA formation from HFO-1234yf means that the transition from HFCs to HFOs could further increase the amount of TFA entering the environment from fluorinated gases.[35] In fact, thanks to increasing emissions from passenger vehicle mobile air-conditioning,[36] HFOs are likely already the dominant source of TFA in Europe.[37]

The impacts of TFA on people and the environment are not yet well understood. TFA toxicity at the levels seen in the environment appears to be low, however concentrations are rapidly increasing and there are many gaps in the evidence, including around the effects of chronic low dose exposure or the impacts on various aquatic species and soils.[38] The European Chemical Agency (ECHA) recently concluded that TFA should be classified as toxic to reproduction (Category 1B), Persistent, Mobile, and Toxic (PMT), and very Persistent and very Mobile (vPvM).[39] Initial evidence published in 2025 also suggests potential immunotoxic effects, and this is an area that urgently requires further research.[40] The Environmental Effects Assessment Panel (EEAP) has previously concluded that the risk to humans from TFA in the environment is currently insignificant,[41] but there is clearly no scientific consensus on this and concerns about TFA are consistently growing within the scientific community.[42]

Removing PFAS from the environment after it is emitted is challenging and costly, particularly in the case of TFA.[43] Questions remain about the technical feasibility of removing TFA from the environment, while removing TFA from Europe's drinking water is estimated to cost €14-15 billion a year.[44] It is therefore critical that the Montreal Protocol takes steps to avoid a potentially catastrophic transition from HFCs to HFOs, which will undeniably add TFA to the environment.[45]

Non-fluorinated, non-PFAS alternatives are available for many HFC applications and prioritising the transition to such substances avoids yet another regrettable substitution that will require unprecedented and complex future mitigation action.

Refrigeration, Air Conditioning and Heat Pumps TOC (RTOC) Progress Report

The 2026 TEAP RTOC progress report demonstrates that growing demand for refrigeration, air conditioning and heat pump (RACHP) systems is a critical issue for both energy consumption and the consumption and emission of refrigerants.[46] Following the adoption of the Kigali Amendment and the introduction of regulations in some regions like the EU, USA, Japan and China, the transition from HFCs to lower GWP refrigerants is progressing.[47]

The RTOC states that "There is no single 'ideal' refrigerant; selection requires balancing legal, safety,

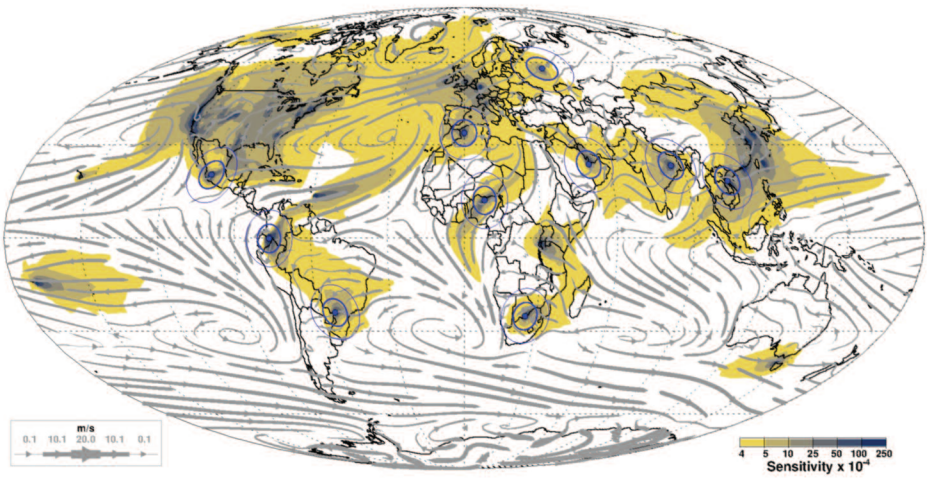
environmental, suitability, cost, efficiency, and usability factors, with increasing attention on lifetime risk assessment." While these elements are important, EIA is concerned that the RTOC continues to overlook significant issues associated with lower-GWP fluorinated refrigerant gases. This includes HFC-32, which still has a GWP of 749,[48] and HFOs, which are associated with production-related emissions of high GWP and ODP feedstocks and increasing contamination of the environment with persistent PFAS (see page 10).[49] Considering the report rightly concerns itself with feedstocks and lifecycle issues of HFCs elsewhere, it should be more consistent in distinguishing between refrigerants that do not carry these issues when assessing the environmental sustainability of refrigerants in RACHP applications.

It is clear however, that non-fluorinated refrigerants (e.g. hydrocarbons such as propane (R-290), CO_2 (R-744) and ammonia (R-717)), often referred to as natural refrigerants, are increasingly being used around the world. RTOC highlights success stories, such as the widespread adoption of natural refrigerants in commercial refrigeration systems in Europe.[50] However, there are critical examples that the RTOC overlooked, such as the numerous cases of certain natural refrigerants being used in transport refrigeration[51] and mobile air conditioning in the public transport sector.[52]

Furthermore, despite concerns expressed by TEAP about the impact of planned PFAS restrictions on the heat pump roll-out, a number of international companies have released heat pumps that operate at large capacities with R-290 in the last few years.[53] European policy actions have supported this move, for example in Germany, where subsidies for heat pumps will only apply to systems that use natural refrigerants from 2028.[54] The RTOC report highlights a number of critical issues associated with the transition to lower GWP refrigerants, including workforce capacity and training and certification, digitalisation, energy efficiency, safety standards, LRM and data gaps. EIA draws the Parties' attention to a useful document produced by the MLF Secretariat, "Challenges in implementing conversion projects in the RACHP sector."[55] This paper highlights ongoing supply chain issues impacting the RACHP transition to low-GWP refrigerants in A5 Parties, including both natural and fluorinated refrigerants.[56] The fact that natural refrigerants are the best solution from both a climate and environmental perspective is an opportunity for A5 countries to build secure home-grown supply chains for sustainable cooling.

AGENDA ITEM 5: Enhancing regional atmospheric monitoring of substances controlled by the Montreal Protocol (Decision XXXVII/1)

Regional atmospheric monitoring can provide invaluable information on the scale and sources of emissions of Montreal Protocol controlled gases occurring in a region. It can allow Parties to have a better understanding of the extent to which particular regions, or emissions sources such as feedstock use, banks and illegal production, explain the gaps that are often seen between global top-down and bottom-up emissions estimates.



Source: NASA Goddard Space Flight Center, Atmospheric Chemistry and Dynamics Laboratory (2025) Surface Winds and Parameters with Proposed Stations (Version 3). Available here Available here

Annual emissions sensitivity of current AGAGE and NOAA sites and the 10 proposed sites. Blue dots represent 10 proposed new sites.[70]

However, large parts of the world – including regions that report significant and growing levels of production and consumption – are not covered by current monitoring networks.[57] Monitoring gaps must be addressed to ensure the continued success of the Protocol: as the 2021 paper from Weiss et al. says, "We cannot manage what we cannot measure."[58]

EIA celebrates the ongoing efforts at the Montreal Protocol and the ExCom to expand regional monitoring capacity. Since MOP37 the Ozone Secretariat and the Advisory Committee have been progressing with the identification and assessment of potential locations for monitoring sites and engaging with country representatives and scientists in countries within five priority regions.[59] Parties must ensure that sufficient funding is made available for the Secretariat and the Advisory Committee to continue this work.

EIA congratulates the ExCom for the recent decision to approve US$9,250,000 to prepare, establish and operate three regional atmospheric monitoring stations in A5 countries.[60] The proposed timeline will see three stations with high-frequency in situ instrumentation or flask sampling established in late 2030 or 2031.[61] The agreed funding includes a further US$1,800,000 to support the continued operation of the additional stations to be established using the anticipated EU grant to the General Trust Fund.

Together, the funding from the MLF and the anticipated EU grant should allow for the establishment of five to six new monitoring stations.[62] Assuming suitable countries agree to act as hosts, this could address the gaps in the five priority regions identified by the Advisory Committee. EIA notes that two Parties have already expressed their interest in hosting monitoring stations and we encourage other Parties to follow suit, noting that emissions data can verify compliance and identify issues which can be addressed by regulators at the national level.[63]

At MOP37, several Parties stressed the need for sustainable funding of monitoring sites after the initial five-year period.[64] Established monitoring stations will need continued technical and financial support.[65] The MLF Secretariat acknowledged that these ongoing costs would not necessarily diminish over time and suggested that they could be reviewed after the initial five-year period.[66] The need for long-term financial support from the MLF must be addressed by Parties, particularly in the context of the MLF replenishment.

EIA acknowledges the progress being made on this issue; however, it is not sufficient to close all the critical gaps in atmospheric monitoring networks. Beyond the five regions prioritised by the Advisory Committee, gaps remain in regions such as Eastern Europe, Russia and much of South America and Africa.[67] EIA recommends that in the coming years, Parties consider how the remaining gaps will be closed. This should include some consideration of the role that alternative monitoring technologies, such as those based on aerial or satellite measurements, might play. Airborne and drone mounted sensors can provide flexible, targeted measurements in specific regions or conditions, to bridge the gap between local and global observations.[68] Studies have also demonstrated the potential for satellites to provide information on regional emissions trends.[69] These alternative technologies can complement monitoring carried out at ground-based stations but also help to shine a light on emissions in regions where gaps in monitoring networks remain.

AGENDA ITEM 6: Ensuring the viability of Montreal Protocol operations

In response to Decision XXXVII/7, the Secretariat prepared the report *Ensuring the Viability of Montreal Protocol Operations: Scenarios, Options and Cost Estimates*.[71] It outlines three scenarios addressing the frequency and modalities of its meetings:

- **Scenario A**. Business as usual (BAU), namely an annual mid-year OEWG and end-of-the-year MOP.
- **Scenario B**. Extended annual MOP in which the work and preparation typically undertaken during the mid-year OEWG is integrated into the annual MOP with intersessional online meetings, as necessary.
- **Scenario C**. Biennial MOP, with OEWG taking place during the off years. In this case, the replenishment cycle for the MLF would also be changed from three years to four, and the frequency of progress reports from the assessment panels would also be reduced to once every four years (to fall between quadrennial assessments).

As the Parties consider the scenarios that would depart its current conduct of business, in effect since 1989, EIA makes the following three observations.

First, given the baked-in costs of personnel, travel, operations and communications, the vast majority of cost savings under the alternative scenarios stem from the merging or elimination of annual OEWG, MOP, Implementation Committee (ImpCom) and Bureau meetings. In comparing the BAU scenario A with the biennial-MOP scenario C for the 2028-2031 period, the cost savings equal roughly US$1.7 million in 2028, US$1.5 million in 2029 and before settling at around US$1.6 million in 2030 and 2031 – with the extended-annual-MOP scenario B falling in between. These cost

savings, however, must be compared to the opportunity cost in advancing the objectives of the Montreal Protocol. This includes not only Kigali Amendment implementation, but also addressing existing issues of banks, feedstock and other production emissions and new issues, such as N_2O.

Second, the primary challenges confronting the viability of Montreal Protocol operations, in terms of cash balances, appear to be twofold: (i) contributions are not equal to the budget for the respective years from 2027 onward; and (ii) the collection rate is suboptimal. In this regard, rather than merge or eliminate meetings, the Parties should pledge what they budget and pay what they pledge.

Third, maintaining the current frequency and modalities has several non-monetary benefits. These include, among others: (i) providing regular forums for the efficient exchange of information, ideas and experiences; (ii) improving access to technical, scientific and policy information; and (iii) facilitating engagement with governments, secretariats, implementing agencies and other stakeholders on existing and emerging issues.

Taken together, at a time when the climate emergency has never been greater, it seems imprudent to potentially undermine the Montreal Protocol for relatively small cost savings that could be secured through other means. The Montreal Protocol has demonstrated its cost-effectiveness, with the MLF instrumental in avoiding more than 51 billion tonnes of CO_2 eq emissions at an estimated cost of approximately US$0.07 per tonne of CO_2 eq, compared with the Intergovernmental Panel on Climate Change (IPCC) benchmark of less than US$20 per tonne of CO_2 eq.[72]

AGENDA ITEM 7: Further strengthening Montreal Protocol institutions

In 2018, large-scale illegal CFC-11 production in China was discovered, triggering discussions on how to avoid similar situations in the future.[73,74] In 2025, a one-day informal meeting of the Parties on facilitating the implementation of the Montreal Protocol was held prior to MOP37.[75] This meeting was an outcome of multiple years of discussion and decisions since 2019 on strengthening the institutions of the Montreal Protocol and dealing with illegal production and trade in controlled substances.[76] It explored these issues in the context of four areas:

1. Import and export licensing systems,
2. Illegal trade,
3. Data collection and reporting systems, and
4. Capacity enhancement.

Licensing systems were described as the 'lynch pin' of the Montreal Protocol's compliance, and it was noted that although they were not static and will evolve over time, there were common features and practices and opportunities to improve licensing systems through digitalisation and other innovations.

Informal Prior Informed Consent (iPIC) was raised on multiple occasions as a useful tool for preventing illegal trade, however concerns were raised that its informal nature undermines its efficacy and several countries were in favour of consideration of a formal or mandatory procedure.[77]

Other key challenges and opportunities raised included:

- The need for improved insights into trade and illegal flows of controlled substances, including domestic trade, e-commerce platforms and reporting.
- Concerns over the proliferation of HFC blends, including the lack of specific harmonised system (HS) codes and counterfeit trade.
- The simultaneous HCFC phase-out with the start of the HFC phase-down.
- The availability of enforcement tools – iPIC, Standard Operating Procedures (SOP), risk management, digitalisation, blockchain technology, banning import and use of non-refillable (disposable) refrigerant cylinders.
- Considerations over the disposal of seized materials, who pays for storage and ultimate disposal, TEAP-approved destruction technologies, and Basel Convention considerations.
- The benefits of transparency and consistency in quota allocation systems, including through the publication of quota holders, allocations and subsequent transfers or trades of allowances. Even where initial quota allocations are published, transparency around subsequent transfers of quota is limited or withheld.
- Non-refillable (disposable) cylinders, their environmental impacts, and their prominent role in the illegal trade.
- The need to link customs systems with environmental inspectors, recognise illegal trade in domestic legislation and impose meaningful penalties.
- The importance of demand reduction by implementing restrictions and bans on the use and trade of new equipment using ODS and greenhouse gas (GHG) refrigerants.

- The importance of proactive risk profiling by customs officials to identify high-risk shipments, based on intelligence and risk indicators, which benefits from inter-agency information-sharing.

- The need for strengthened capacity and cooperation, including SOP on enforcement case handling, seizures, bans on non-refillable (disposable) cylinders, reporting and sanctions, improved inter-agency cooperation between national ozone units and customs and enhanced regional cooperation.

Ultimately, there are multiple ways to strengthen the institutions of the Montreal Protocol and enhance efforts to prevent and respond to illegal trade in controlled substances, however the Parties have so far not responded in any concrete way.

As A5 Parties embark on the HFC phase-down while simultaneously implementing the final steps of the HCFC phase-out, there is an urgent need to ensure adequate capacity to tackle the inevitable illegal trade and to establish improved systems, taking advantage of innovative digital tools, backed by coordinated sharing of information and robust legal frameworks. It is beyond time that concrete decisions with concrete impacts are generated from these discussions which date back to 2018, particularly in light of the upcoming 10-year anniversary of the Kigali Amendment during MOP38.

EIA recommends that Parties formulate a roadmap to strengthen the institutions of the Montreal Protocol to tackle illegal trade. The roadmap could be developed by a task force, based on consideration of the reports and meeting outcomes from discussions since 2019 to date, and additional reports outlining the following:

- Options for building A5 capacity to design and implement best practice licensing systems.

- Available tools, including new digital tracking tools, that could be deployed by Parties to enhance monitoring and tracking of controlled substances, including through the supply chain and e-commerce platforms. These tools must be accompanied by relevant capacity-building and training, and support for the development of regional and international cooperation and information-sharing.

- Development and adoption of best practice procedures for responsible and compliant management of identified illegal trade in controlled substances, ensuring that denied or seized substances are tracked through to their final disposition, including clear guidance for seizures, returns, storage, destruction and traceability to prevent their re-entry into illegal trade or their release into the atmosphere. Guidance should also clarify associated cost allocations and identify where MLF support may be appropriate to support environmentally sound practices, especially for A5 countries.

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