Half-day session for an informal discussion on strategic approaches to Kigali Amendment implementation

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Introduction

The Montreal Protocol has long been hailed as the most successful multilateral environmental agreement due to its success in phasing down ozone-depleting substances (ODS). In recent years however, as the Montreal Protocol confronts challenges it has yet to resolve, questions about this success have been raised. These challenges include issues related to monitoring, reporting, verification and enforcement (MRV+E), high levels of emissions from ODS banks and fluorochemical industrial processes and the rise of hydrofluorocarbon (HFC) consumption and emissions in developing countries.

With regard to HFCs, it is clear that the Kigali Amendment is not sufficiently ambitious to meet climate mitigation targets that will avoid catastrophic climate change. This is in part due to the hydrochlorofluorocarbon (HCFC) component of the A5 baseline calculation, which uses a country's average 2020-2022 HFC consumption as its base, adding an amount equal to 65% of the country's HCFC baseline on a CO_2-equivalent (CO_2-eq) basis. This approach, which significantly increases many A5 HFC baselines, fails to account for the fact that A5 Parties have already phased out almost 50% of HCFCs (on an ODP basis) and that further HCFC Phase-Out Management Plans (HPMPs) have already been approved to phase out HCFCs to 32.2% of the starting point.[1]

The impact of the HCFC component is demonstrated clearly by the fact that only one of 16 Kigali Implementation Plans (KIPs) submitted to the 94th Executive Committee (ExCom) meeting aims to achieve a real-term reduction in HFC consumption by 2029 (*i.e.*, a reduction that represents a decrease from actual reported HFC consumption in the baseline years). Failure to address rising HFC emissions, one of the lowest hanging fruits in the climate mitigation basket, is not acceptable at a point in time when temperature records are being broken daily and the world is hurtling past 1.5°C. Meanwhile, the need to maintain and enhance energy efficiency remains another critical climate mitigation challenge as global demand for cooling is set to triple by 2050.

Article 2.1 of the Vienna Convention for the Protection of the Ozone Layer requires Parties to protect health and environment from adverse effects of actions taken to protect the ozone layer. Despite this, previous ODS phase-outs under the Montreal Protocol have failed to avoid the uptake of high-global warming potential (high-GWP) alternative F-gases, even though financial incentives to avoid the uptake of HFCs through the Multilateral Fund's (MLF) HCFC cost guidelines did avoid some significant amount of HFC consumption. Bearing this in mind, it now behoves the ExCom to consider avoiding, wherever possible, the uptake of hydrofluoroolefins (HFOs), many of which are (or breakdown into) per- and polyfluorinated substances (PFAS).

Given these challenges, the ExCom must consider strategies to maximise its broad impact and avoid limiting itself only to the most "cost-effective" option on a project-by-project basis. This approach, which seems only to consider monetary price rather than the full set of associated costs, fails to see the forest for the trees.

For these reasons, EIA welcomes the half-day session for informal discussion on strategic approaches to Kigali Implementation. We feel it is an opportunity to explore, in a setting that is conducive to candid exchange, how we can do better. The time is ripe for the Montreal Protocol, including the MLF, to initiate a new cycle of ambitious policymaking that is responsive to the urgent climate challenge. EIA deeply regrets that the half-day session has been closed to observer participation, especially considering the informal nature of the discussions, however we appreciate participants consideration of the views we share here on these important issues.

Session One: Strategic directions for the implementation of the Kigali Amendment

1.1 Supporting action beyond Kigali Amendment compliance

With the recent replenishment, the MLF is in an unprecedented position to support a rapid transition to climate and environmentally friendly substances and technologies. This includes high-growth sectors such as unitary air-conditioning and heat pumps as well as refrigeration. Notably, such a transition is already well underway in the European Union (EU) and, with the recent revision of the EU F-Gas Regulation, is now legislatively locked-in.[2] The MLF should piggyback on this time-bound opportunity to catalyse a similar transition in developing countries by adopting a package of policies and initiatives that support accelerated implementation in novel ways.

Supporting action beyond Kigali Amendment compliance will require funding beyond the levels previously given. Indeed, even to maintain compliance, higher levels of funding will be required given the additional challenges associated with the HFC phase-down, being implemented in parallel with the last challenging steps of the HCFC phase-out. Moreover, previous levels of funding have not always been sufficient. For example, a review by the Secretariat of the criteria for funding the HCFC phase-out in the consumption sector noted that actual capital costs of almost-completed HCFC investment projects in the foam sector were 25 to 30 per cent higher than the costs agreed with the Secretariat.[3]

Front-Loaded Funding / Acceleration. The MLF should provide the option to developing countries to receive front-loaded funding to unilaterally accelerate their HFC phase-down schedule, with clearly defined objectives and sectoral transitions. Such accelerations, taken in tandem with those underway in the EU, have the potential to significantly influence global market dynamics and facilitate early adoption of climate and environmentally friendly substances and technologies in all countries, not just those taking early action.

Cost Guidelines / Climate-Environment Bonus. To avoid the uptake of HFOs, under its cost guidelines, the MLF should include a bonus of 25% or more where needed for manufacturing conversions to energy-efficient equipment relying on natural refrigerants. In the servicing sector, this should also include additional funding earmarked for the training of contractors and installers to handle such equipment, which have varying safety requirements, additional controls and different working pressures, thereby facilitating their market penetration and uptake. The ExCom should also consider funding proposals for the development of natural refrigerant production facilities, where the regional benefit/need can be clearly seen.

Energy Efficiency. The Montreal Protocol should promote energy efficiency within its existing institutional framework and apply its decisions to projects under the HCFC phase-out as well as the HFC phase-down. Decision XXVIII/2 guides the ExCom to consider supporting energy efficiency for manufacturing projects and servicing activities that are transitioning or supporting the transition to low- and zero-global warming potential alternatives to HCFCs and

HFCs only. The support should therefore be restricted to environmentally acceptable low- and zero-GWP alternatives, *i.e.* non-fluorinated alternatives such as natural refrigerants. EIA recommends that the ExCom considers cost-effective investments in "avoidable technology upgrades" related to the energy efficiency of appliances' refrigeration systems, up to 25% above the refrigerant cost-effectiveness threshold.[i]

At the same time, the ExCom should ensure that the conditions for market uptake of the higher energy efficiency products are either already in place, or that commitments are made to put them in place as a condition of project approval, possibly with Multilateral Fund non-investment support, *e.g.* through minimum energy performance (MEP) standards, labelling programmes and other incentives.

The ExCom should request implementing agencies to seek opportunities for co-funding energy efficiency investments and non-investment activities during project preparation.

1.2 Supporting National and/or Sectoral Approaches

As the first region to control HFC emissions, the EU, with measures in place since 2006, offers lessons for a strong policy framework. Collectively, EU member states have already phased down HFCs to less than half of their 2022 limit under the Montreal Protocol's Kigali Amendment.[4] Initially focused on reducing leakage, the EU F-Gas Regulation was strengthened in 2014 with a commitment to phase down HFCs starting in 2015.[5] After seven years in force, the legislation was revised again, this time with a view to meeting the EU's climate target to reduce net greenhouse gas emissions by at least 55% by 2030 compared to 1990, and to reach climate neutrality in 2050.[6] As a result, the new F-Gas Regulation stipulates a complete phase-out of HFCs by 2050.[7]

While the 2014 F-Gas Regulation was undoubtedly successful in reducing consumption and emissions of HFCs (by an estimated 47% in CO_2-eq terms from 2015-19), the European Commission's evaluation highlighted a number of areas for improvement. In particular, the evaluation noted the continued use of high-GWP F-gases despite the availability of alternatives, and the continued existence of "unjustified" barriers to climate-friendly alternatives. Concerns were also raised over illegal trade in HFCs, and the "undesirable environmental effects" of 4th generation fluorochemicals, HFOs.[8]

Successful HFC Reduction Strategies. A highly successful strategy in the EU has been to identify by sector / equipment type where alternatives are available and to ban the placing on the market of new equipment containing HFCs. These bans, which can be placed in future years, act as signposts for both equipment manufacturers and end users, guiding them away from investment in soon-to-be obsolete technologies. In the 2014 EU F-gas Regulation, the ban in commercial refrigeration equipment demonstrated the value of this approach.[ii] Although the ban only came into effect in 2022, eight years after the Regulation was adopted, it sent a clear signal to end users that has resulted in rapid uptake of alternatives such as CO_2 transcritical systems. Today the EU is a hub of innovation in the sector.

[i] "Avoidable technology upgrades" are technology improvements resulting from a refrigerant transition that are not incidental to the conversion project but rather are explicitly undertaken to gain a competitive advantage.

[ii] The ban prohibits the use of F-gases with GWP of 150 or more in multipack centralised refrigeration systems above 40kW, except in the primary circuit of a cascade system where F-gases with a GWP of less than 1500 may be used from 1 January 2022.

As of December 2023, an estimated 68,500 food retail stores in Europe used transcritical CO_2 systems, with a market penetration of 22.9%, up from 14.1% in 2021.[9] Likewise, the European Commission evaluation of the F-Gas Regulation identified that the major driver for an observed reduction of HFCs in stationary AC was the replacement of HFC-410A (GWP 2088) with HFC-32 (GWP 675) in new small split units, which occurred in advance of a 2025 new equipment ban with a GWP threshold of 750, and the replacement of HFC-410A with propane (GWP<1) in new hermetically sealed moveable units, in line with the 2020 new equipment ban with a GWP threshold of 150.[iii] [10]

The revised 2024 EU F-gas Regulation includes additional bans to reduce HFCs, including in new self-contained and split air-conditioning and heat pump equipment up to 12 kW—both high growth sectors in developing countries—starting with a ban on HFCs with GWP ≥150 or more from 2027 and 2029 followed by a ban on all fluorinated gases from 2032 and 2035, respectively.[11] The marketplace is already responding to these clear market signals, and in the last few months dozens of new propane models have been announced by manufacturers. Sectoral approaches and prohibitions of high-GWP refrigerants when lower-GWP alternatives are available have also been successfully implemented in the United States.[12]

The KIPs to date have identified significant consumption of very high-GWP HFCs such as HFC-404A in commercial refrigeration. This HFC, which has a GWP of 3,920, can easily be avoided in new systems through placing-on-the market bans, and can be addressed in existing systems through replacement of the refrigerant with a lower-GWP HFC alternative, as required in the EU F-Gas Regulation since 2020. Bans on the use of very high-GWP HFCs, particularly when used in very leaky systems (such as commercial refrigerant) or in fully emissive technologies (*e.g.* HFC-23 in fire suppression) can enable significant early reductions in CO_2-eq consumption and emissions.

Combatting illegal trade. As the first region in the world to cut the supply of HFCs, the EU experienced substantial illegal HFC trade. HFC prices in the EU increased significantly from mid-2017 in anticipation of a major reduction step in 2018, peaking at levels 6 to 13 times higher than in 2015.[13] The high prices stimulated black-market trade, ably assisted by vast profits, low chance of detection or penalties and a lax licensing system wide open to abuse. EIA estimates that illegal trade of HFCs in 2019 amounted to as much as 20-30% of the legal trade, equivalent to potential emissions of 30 million tonnes CO_2-eq and over €77million in lost VAT and customs duty revenues.[14]

Fundamentally, the key challenge was the absence of a real-time per shipment licensing system that would allow customs officials to determine if an HFC import was covered by a quota. The new F-Gas Regulation addresses this to some extent, and also puts in place a number of other measures to support compliance and enforcement, including: mandatory registration for importers, a prohibition on the use of non-refillable containers; mandatory confiscation of illegal imports, enhanced reporting obligations on importers; and penalties for violations.

The United States has also taken a "whole of government" approach to illegal trade in its implementation of the American Innovation and Manufacturing Act (AIM Act) of 2020, which has already seen several high-impact enforcement actions, including the prevention of multiple illegal imports.[15] High-level coordination between environmental agencies and their various counterparts, including customs and border control, is essential to detecting illegal trade and taking enforcement action. In the U.S., the Interagency Task Force on Illegal HFC Trade is led by

[iii] GWP from AR4 is used, as this is currently the GWP reference used in the F-Gas Regulation. The most recent IPCC assessment (AR6) calculates the GWP of HFC-32 to be 771, which exceeds the current GWP threshold for the split A/C prohibition in 2025.

the Department of Homeland Security and EPA, in partnership with the Departments of Justice, State and Defence. In just the first nine months of 2022, the Task Force prevented illegal shipments equivalent to 889,000 $MtCO_2$-eq. The US EPA continues to take strong legal action against major HFC importers violating reporting requirements. This model of collaboration between federal agencies will be critical as supplies dwindle and prices increase.

In coming years, as the legal limits for HFC and HCFC (in Article 5 Parties) consumption reduce globally, the incentive for illegal activity will only increase. Recognising this, EIA also advocates for the use of modern approaches such as QR codes or blockchain to monitor HFCs through the supply chain that can greatly support compliance.

Dedicated Work Programmes / Sectoral Strategies. Certain sectors should be targeted for dedicated work programmes by the MLF (and the Meeting of the Parties) to develop and implement comprehensive sectoral strategies, particularly those with unique considerations, stakeholders or value chains. Examples include fisheries, tourism and cold chains. Terms of reference for such dedicated work programmes could include: stakeholder consultation, technology assessments, pilot and demonstration projects, development of training and capacity-building programmes, education and awareness-raising initiatives and technical guidance on best practices and legislation, among other activities. The comprehensive sectoral strategies could be advanced during KIP implementation with the support of the MLF.

1.3 Targeting Investments to Key Kigali Amendment Implementation Issues

Extended Producer Responsibility / Lifecycle Refrigerant Management. Extended producer responsibility (EPR) schemes are a set of measures to ensure that producers of products bear financial responsibility, or financial and organizational responsibility, for the management of the waste stage of a product's life cycle. EPR schemes have become a mainstream policy approach in many places, significantly reducing the burden on waste management on local and national authorities.[16] EPR schemes can ensure that the management of banks is sustainably financed, operating over the long-term without the need for outside funding, and fulfilling certain functions that have proven challenging, such as: (i) collection, storage, transport and destruction; (ii) provision of tools and equipment to technicians for on-site recycling and recovery; (iii) education and awareness-raising; and (iv) reporting. EPR schemes should be subject to minimum requirements, which could be set out in guidelines. Once up and running, EPR schemes significantly reduce the burden on governments. To this end, the MLF could provide funding for policy development of EPR schemes in A5 Parties via a window or as part of KIP implementation. Once operational, bank management would be sustainably financed without the need for outside funding, thus reducing demands on MLF.

Windows. With the recent replenishment, the MLF should consider opening a series of windows to address issues raised in the submissions. For example, the MLF could support pilot and demonstration projects specifically on product development. It could solicit proposals for projects designed to support development of energy-efficient components such as compressors, variable speed control drives, brushless direct DC motors and electronic expansion valves, among others, as well as low-cost variable speed compressors. EIA envisions the possibility of several funding windows being opened to address many of the issues that have been identified in the submissions, making funding available and gaining experience to inform future decisions.

Session Two: Strengthening the Capacity of MLF Institutions and Stakeholders to Implement the Kigali Amendment

Institutional Strengthening. The success of the Montreal Protocol has been widely accredited to, *inter alia*, the global network of National Ozone Units (NOUs) and the capacity building enabled through Institutional Strengthening (IS). NOUs must now undertake simultaneous HFC and HCFC control measures between 2020-2030, including new responsibilities for HFCs. To date however, they have received less than 5% of the total funding approved by the MLF.[17]

The complexities facing A5 Parties are significant, not least the parallel implementation of the phase out of HCFCs and the phase down of HFCs. NOUs will need to promote the adoption and safe use of low-GWP alternatives, addressing safety codes and standards, as well as energy efficiency and banks of both ODS and HFCs. For context, a recently published impact assessment for the review of the EU F-Gas Regulation calculated an annual cost of 5.8 million EUR for F-gas certification programmes to also include F-gas free alternatives and practical training on all alternatives, and to add energy efficiency issues to be part of training (stationary RACHP).[18]

Funding for IS projects has been increased three times since they were initially agreed in 1992: in 2001 by 30% to help countries carry out the new MLF strategic framework and provide support for critical areas such as public awareness; in 2015 by 28% to address challenges related to the phase-out of HCFCs in line with the objectives of decision XIX/6; and in 2022 by 38%, with a minimum level of funding of US $60,000 per year. Despite the relatively recent increase, which was required by Decision XXVIII/2 para 21, funding levels for smaller countries are still extremely low considering the broad range of tasks that need to be carried out, and the benefits delivered by doing so.

EIA recommends that the next review of IS projects be carried out well before the 2029 deadline set by Decision 91/63 and urges ExCom members consider higher proportional increases to A5 Parties that are low volume consuming (LVC) countries. Many such Parties are funded at the minimum level of US$60,000 per year by the MLF. For these countries, a percentage increase in funding (as has occurred previously) only amounts to a very small increase in real terms.

EIA also supports increased funding for the Compliance Assistance Programme (CAP) to strengthen activities under the regional ozone networks. This will be critical for a wide range of activities under the Protocol, which may include: implementation of the HFC phase-down; countering illegal trade; driving energy efficiency improvements; addressing ODS and HFC banks; and addressing unexpected emissions of controlled substances. The experience of the EU, which has seen significant illegal trade in HFCs since the 2015 start of the HFC phase-down under the F-Gas Regulation, is a cogent reminder of the challenges facing A5 Parties.[19]

Furthermore, EIA notes that regional networks of ozone officers are an important tool that have contributed significantly to the success of the Montreal Protocol. They are a unique discussion forum, which is increasingly important given the broadening range of controls and other issues facing the Parties, including HFCs, energy efficiency, ODS and HFC banks and unexpected emissions of controlled substances.

The CAP should also be sufficiently funded to broaden participation in regional networks to other relevant stakeholders, including civil society, in priority areas previously identified by the ozone officers (*e.g.*, waste disposal and illegal trade), and to enable inter-region exchanges.

Regional Centres of Excellence. In 2002, OzonAction created the CAP to deliver on the clearinghouse mandate in Article 10 and to assist developing countries. A distinct feature of CAP was to relocate staff to the regions, to deliver more timely advice and assistance to both individual countries and the regions themselves, engaging with national ozone units on a day-to-day basis to support and sustain compliance. This also facilitated the operation of regional ozone networks, which provide a range of services in addition to capacity-building and training.[20] CAP is described as the "cornerstone of the institutional architecture in place to assist [developing] countries to comply with their obligations under the Montreal Protocol".[21] For the role it plays, CAP is remarkably cost-effective. In the UNEP business plan for 2024-2026, CAP has been budgeted US $11.6 million in 2024, US $11.9 in 2025 and US $12.3 million in 2026.[22] EIA believes that, similarly to CAP, Regional Centres of Excellence should become an integral part of the delivery of assistance to developing countries, particularly as it relates to supporting the uptake of climate and environmentally friendly alternatives through a range of activities that have been identified in the submissions, but also to promote sustainable cooling and cold chain, energy efficiency and lifecycle refrigerant management.

Training and Enforcement. The HFC phase-down presents a number of new challenges for monitoring and enforcement. The MLF could fund a series of training and enforcement workshops to raise awareness and engage customs and other implementation agencies, so they are up to speed with the new challenges (including the CO2-eq metric, new HS codes and the variety of HFC blends), learning lessons from the significant HFC illegal trade experienced in the EU. These could be implemented through the regional ozone networks.

Carbon Trading Imperils the Climate Protection Legacy and Ambitions of the Montreal Protocol

In the written views submitted by Sweden and co-opted European Free Trade Association (EFTA) members (Austria, Finland, Iceland, Norway and Switzerland), the notion of mobilising funding through carbon credits to finance collection, reclamation and destruction systems and facilities is raised, with a suggestion that possibilities and challenges should be discussed during the informal session.

The idea of addressing ODS and HFCs by selling permits to emit other forms of climate pollution raises a number of immediate concerns. These include concerns about adherence to the Vienna Convention on the Protection of the Ozone Layer; concerns about undermining the climate protection legacy of the Montreal Protocol; concerns about subverting efforts to take a holistic approach to the triple planetary crisis, including by pursuing synergies in solutions; and concerns about privileging private rent-seeking over public benefits. These concerns, which are specific to the Montreal Protocol context, rest on a broader nest of recent and historic carbon trading scandals, as well as a host of accounting, verification, additionality, perverse incentive and other practical challenges. Together, these recurring problems have made carbon credit trading one of the most controversial topics in the global discourse on climate change.

Within the specific context of the Montreal Protocol, Article 2.1 of the Vienna Convention for the Protection of the Ozone Layer stipulates that Parties shall take measures to protect health and environment from adverse effects of actions taken to protect the ozone layer. The definition of adverse effects in Article 1.2 of the Convention specifies that this includes adverse effects on climate. Therefore, to take actions to prevent ODS and HFC emissions which are paid for by selling permits to pollute the climate system would clearly seem to derogate from Article 2.1.

Overall, the storied legacy of the Montreal Protocol has been one of not only successfully avoiding adverse effects on health and environment, but one of delivering massive co-benefits to the climate system from actions taken to protect the stratospheric ozone layer. At a time of keen interest in providing urgently needed additional benefits to the climate system, the Parties

to the Montreal Protocol would be wise to avoid reversing their historically successful approach, from one that provides added benefits to the climate system from ozone protection, to one that makes the climate system pay, both literally and figuratively, for ODS destruction.

Selling climate pollution permits to address ODS and HFCs would also subvert the emerging ambition of many Parties to pursue "a holistic approach to the HFC phase-down, cognizant of the triple planetary crisis, taking account of synergies and trade-offs with other environmental challenges".[23] Indeed, developing climate pollution permits from ODS/HFC destruction would achieve precisely the opposite. It would foreclose the opportunity to secure the ozone and climate protection synergies the Montreal Protocol has always historically delivered. It would prevent the adoption of effective national policies to address ODS and HFC banks (such as EPR), as such policies would prevent countries from meeting the additionality requirements of carbon credits. Instead, it would deliberately monetize a trade-off in which the ozone and/or climate damage from a quantity of super-pollutant gas can be avoided if the right to cause the same amount of climate damage can be sold at a private profit.

The climate protection provided by the Montreal Protocol has been a tremendous co-benefit from protecting the ozone layer. For the Montreal Protocol to now change course and decide to fund activities to protect the ozone layer by selling rights to emit climate pollution equivalent to the climate impact of the ODS destroyed would not only turn its back on its climate protection legacy at a time of climate emergency but would be sacrificing these benefits to enhance private profits. The ExCom's discussion of how to provide "concrete and demonstrable additional benefits beyond existing funding models" is clearly a poor setting to entertain such an approach.

When the finance to destroy ODS is driven precisely by the amount of climate pollution permitted from the purchase of the credits sold, the ExCom can be certain that the more money raised for ODS destruction from such carbon crediting mechanisms, the more damage is being done to the climate system by the pollution those credits permit. This is the antithesis of pursuing solutions that take a holistic approach to the triple planetary crisis. Indeed, this approach claims to effectively address one form of environmental protection by burying its head in the sand regarding its concomitant environmental harms.

As it looks to the future, the ExCom should recall that the Montreal Protocol's recent accomplishments, such as the Kigali Amendment and its phase down of HFCs, were developed and driven primarily by serious concerns about impacts on the global climate system. The Montreal Protocol, now more than ever, must pursue the synergies it is celebrated for achieving, especially the enormous co-benefit of reduced climate forcing from the elimination of high-GWP ODS. Now is not the time for the Protocol to reverse its historical course, to undermine its proud legacy of achieving ozone and climate protection synergies, nor to violate Article 2.1 of the Vienna Convention by causing adverse climate impacts to pay for its work.

References

[1] Multilateral Fund Secretariat (2024), *UNEP/OzL.Pro/ExCom/94/5 Country programme data and prospects for compliance*. Accessible at: http://www.multilateralfund.org/94/pages/English.aspx (see table 4).
[2] European Union (2024), *Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on Fluorinated Greenhouse Gases*. Accessible at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R0573.
[3] Multilateral Fund Secretariat (2013), *UNEP/OzL.Pro/ExCom/70/52 Criteria for funding HCFC phase-out in the consumption sector adopted by decision 60/44*. Accessible at: http://www.multilateralfund.org/70/pages/English.aspx.
[4] Ludig, S., Jörß, W. & Liste, V. (2023). *ETC CM report 2023/04: Fluorinated greenhouse gases 2023*. Accessible at: https://www.eionet.europa.eu/etcs/etc-cm/products/etc-cm-report-2023-04/.
[5] European Commission (2024). *EU-Rules: Guidance on the EU's F-gas Regulation and its legal framework*. Accessible at: https://climate.ec.europa.eu/eu-action/fluorinated-greenhouse-gases/eu-rules_en.
[6] Ibid.
[7] EIA Briefing "Ending the Reign of Fluorinated Greenhouse Gases". Available here
[8] Birchby, D., Dubey, J. & Johansen, B. *et al.* (2022). *CLIMA.A2/ETU/2019/0016 Support contract for an Evaluation and Impact assessment for amending Regulation (EU) No 517/2014 on fluorinated greenhouse gases*. Accessible at: https://climate.ec.europa.eu/system/files/2022-04/f-gas_evaluation_report_en.pdf.
[9] ATMO (2023). *Natural refrigerants: State of the Industry (2023 Edition)*. Accessible at: https://r744.com/atmosphere-releases-2023-market-report-showing-robust-growth-of-transcritical-co2/.
[10] Forster, P., Storelvmo, T. & Armour, K. *et al.* (2021). *The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity.* In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Accessible at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf (see page 1017); Birchby, D., Dubey, J. & Johansen, B. *et al.* (2022). *CLIMA.A2/ETU/2019/0016 Support contract for an Evaluation and Impact assessment for amending Regulation (EU) No 517/2014 on fluorinated greenhouse gases*. Accessible at: https://climate.ec.europa.eu/system/files/2022-04/f-gas_evaluation_report_en.pdf (see pages 73 & 78).
[11] European Union (2024), *Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on Fluorinated Greenhouse Gases*. Accessible at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R0573 (see Annex IV).
[12] United States Environmental Protection Agency (2024). *Significant new alternatives policy (SNAP) program*. Accessible at: https://www.epa.gov/snap.
[13] Birchby, D., Dubey, J. & Johansen, B. *et al.* (2022). *CLIMA.A2/ETU/2019/0016 Support contract for an Evaluation and Impact assessment for amending Regulation (EU) No 517/2014 on fluorinated greenhouse gases*. Accessible at: https://climate.ec.europa.eu/system/files/2022-04/f-gas_evaluation_report_en.pdf (see page 92).
[14] Environmental Investigation Agency (2021). *Europe's Most Chilling Crime-The illegal trade in HFC refrigerant gases (press release 8 July 2021).* Accessible at: https://eia-international.org/press-releases/the-biggest-eco-crime-no-ones-heard-of-illegal-refrigerant-trade-in-europe-exposed/.
[15] United States Environmental Protection Agency (2022). *U.S. Takes Aim at Violators of Greenhouse Gas Phasedown and Reporting Programs*. Accessible at: https://www.epa.gov/newsreleases/us-takes-aim-violators-greenhouse-gas-phasedown-and-reporting-programs; United States Environmental Protection Agency (2024). *EPA Enforcement Prevents Multiple Illegal Imports of Super Climate Pollutant*. Accessible at: https://www.epa.gov/newsreleases/epa-enforcement-prevents-multiple-illegal-imports-super-climate-pollutant.
[16] *See e.g.,* Environmental Investigation Agency (2016). *National Producer Responsibility Schemes*. Accessible at: https://eia-international.org/wp-content/uploads/EIA-Briefing-Note-National-Producer-Responsibility-Schemes-FINAL.pdf (Annexes V-VIII); European Union (2024), *Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on Fluorinated Greenhouse Gases*. Accessible at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R0573 (Article 9); European Union (2008), *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*. Accessible at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705 (Articles 8 & 8a).

[17] Multilateral Fund Secretariat (2023), *MLF Communication tool*. Accessible at: http://www.multilateralfund.org/InformationandMedia/Brochures%20published%20by%20the%20Secretariat/MLF%20communication%20tool_1_May%202023_FINAL.pdf
[18] European Commission (2022). *Commission staff working document: Impact assessment report*. Accessible at: https://climate.ec.europa.eu/system/files/2022-04/f-gases_impact_assessment_en.pdf (see page 52).
[19] Environmental Investigation Agency (2021). *Europe's Most Chilling Crime-The illegal trade in HFC refrigerant gases*. Accessible at: https://eia-international.org/report/europes-most-chilling-crime/.
[20] United Nations Environment Programme (2024). *Ozonaction: Networks*. Accessible at: https://www.unep.org/ozonaction/networks.
[21] Multilateral Fund Secretariat (2023). *UNEP/OzL.Pro/ExCom/93/12/Rev.1 Terms of Reference for the Evaluation of the Compliance Assistance Programme (Desk Study)*. Available at: http://www.multilateralfund.org/93/pages/English.aspx.
[22] Multilateral Fund Secretariat (2023). *UNEP/OzL.Pro/ExCom/93/28 UNEP Business Plan for 2024-2026*. Available at: http://www.multilateralfund.org/93/pages/English.aspx.
[23] Multilateral Fund Secretariat (2024). *Compilation of issues submitted by members and co-opted members broken down by topic*. Accessible at: http://www.multilateralfund.org/94/pages/Half-day%20Session.aspx (see page 4).