

EIA Briefing to the 93rd Meeting of the Executive Committee of the Multilateral Fund

15-19 December 2023

The 93rd Meeting of the Executive Committee of the Multilateral Fund (ExCom 93) comes at a critical juncture. The meeting follows record-breaking monthly temperatures from June through November, with 2023 set to be the warmest year on record at a global mean near-surface temperature around 1.4°C above pre-industrial levels.¹ The disastrous impacts of climate change are felt around the world on a daily basis.

This is the critical decade for action on climate. The Montreal Protocol therefore has a tremendous responsibility to maximise the reduction of greenhouse gas (GHG) emissions through the hydrochlorofluorocarbon (HCFC) phase-out and hydrofluorocarbon (HFC) phase-down. The historic US\$ 985 million replenishment of the Multilateral Fund at MOP35 sets the scene for bold and ambitious decisions to be taken by the ExCom. It is therefore extremely disappointing that, of 23 KIPs submitted to this meeting, nine envision an actual increase in HFC consumption by 2029, compared to 2022. This is in direct contrast to the necessary “deep, rapid and sustained reductions in global greenhouse gas emissions of 43% per cent by 2030 and 60 per cent by 2035 relative to the 2019 level,” recently endorsed at the UN Climate Change Conference in Dubai (COP28).²

COP28 also witnessed the launch of the Global Cooling Pledge, which aims to reduce cooling-related emissions across all sectors by at least 68% globally relative to 2022 levels by 2050. The Pledge commits signatories to “support robust action through the Montreal Protocol Multilateral Fund for early action to reduce HFC consumption and to promote improved energy efficiency for the HCFC phase-out and HFC phase-down”.³ EIA urges Parties to the Montreal Protocol to join the Pledge and ensure that the Protocol and the MLF are central to its implementation.

With the first control measure for Article 5 (A5) Group 1 Parties starting next year, the HFC cost guidelines must be agreed to at this meeting. EIA urges ExCom to adopt flexible and generous HFC cost guidelines that will maximise opportunities for A5 Parties to accelerate actions under the HFC phase-down, improve energy efficiency, address stockpiles and banks and, wherever possible, avoid the uptake of environmentally damaging alternatives, namely hydrofluoroolefins (HFOs).

¹ WMO Press Release, Nov 2023. 2023 shatters climate records, with major impacts. Available at: <https://rb.gy/ageud6>; European Commission Press Release, December 2023. Copernicus: November 2023 – Remarkable year continues, with warmest boreal autumn. 2023 will be the warmest year on record. Available at: <https://rb.gy/f8aopl>

² UNFCCC, Outcome of the first global stocktake – draft decision. December 2023. Available at: https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf

³ COP28 UAE, Global Cooling Pledge for COP28. December 2023. Available at: <https://www.cop28.com/en/global-cooling-pledge-for-cop28>

Agenda Item 5: Country Programme Data

Doc 93/8: Country programme data and prospects for compliance

A review of the country programme (CP) data highlights the opportunities for a number of countries to leapfrog high-GWP HFCs in remaining stages of HPMPs yet to be approved and offers a more detailed picture of HFC consumption.

HCFC phase-out progress and opportunities to leapfrog

As of MLF92, ExCom has approved HPMPs to phase-out 77% of the starting point for aggregate reduction in HCFC consumption. 7,474 ODP tonnes of HCFC consumption have yet to be approved, 6,861 ODP tonnes or 91% of which is HCFC-22. More than 50 countries have 20% or more of their HCFC consumption remaining unaddressed, including major consumers such as China, Argentina, Brazil, and Thailand (see Annex I).

Initial data on sectoral HFC consumption

Based on the CP data submitted by 110 countries for 2022, Table 1 provides a breakdown in sectoral HFC consumption on a CO₂-equivalent (CO₂-eq) basis. Almost 50% of consumption is split between air conditioning (AC) and refrigeration manufacturing sectors, with an additional 36% in the servicing sector. About 16% is consumed in non-refrigerant end uses. HFC-404A, HFC-410A and HFC-134a are the most widely consumed HFCs. As shown in Table 2, refrigeration (HFC-404A and HFC-134a) dominates consumption in low-volume-consuming countries (LVCs) while in non-LVCs, the air-conditioning (HFC-410A) sector dominates.

Table 1: HFC consumption by sector, 2022 (thousand tonnes CO₂-eq)

	Aerosol	Foam	Fire Fighting	Refrigeration manufacturing			Ref Serv.	Solvents	Other	Total
				Other	AC	Total*				
Thousand Tonnes CO₂-eq**	9,247	14,244	119,250	271,193	264,078	550,729	401,110	1,000	38,312	1,210,029
Percentage (%) **	0.83%	1.27%	10.66%	24.25%	23.61%		35.86%	0.09%	3.43%	

*Breakdown in manufacturing for 15,458 MtCO₂-eq was not provided and is only accounted for in the Total.

** 92.43% of total HFC consumption reported is included in sector breakdowns. Therefore, amounts reported in the sector breakdown do not add up to total consumption. The percentages shown reflect the proportion of the total data reported that was broken into sectors, not a percentage of total reported consumption for all 110 countries.

Table 2: Key HFCs consumed in 2022, including blends, on a CO₂-eq basis, as % of total

	R-404A	HFC-134a	R-410A	R-507A	R-407C	R-407A	HFC-227ea	HFC-32
LVC Countries	35.4%	27.3%	18.9%	6.2%	5.3%	2.8%	N/A	N/A
Non-LVC Countries	12.5%	20.8%	30.2%	9.5%	N/A	N/A	8.6%	7.0%

Agenda Item 7: Programme Implementation

[Doc 93/22: 2023 consolidated project completion report \(part II\)](#)

The consolidated project completion report (PCR) covers 48 PCRs for multiyear agreements, 47 related to HCFC phaseout management plans (HPMPs) and one related to completion of the last CFC production project. Key lessons learned that are relevant to development of future stages of HPMPs and Kigali Implementation Plans (KIPs) include:

Technical issues relevant to servicing sector:

- Some servicing workshops lacked proper tools and equipment to follow good practices due to a limited number of suppliers of servicing tools in the country. It is recommended that a set of criteria be developed to identify efficient and effective training content, locations and equipment distribution to support HPMP and KIP implementation;
- Continuous training on safety precautions to handle flammable refrigerants is needed.

Alternative technology:

- Advanced scientific and technical information led to increased availability of alternative technologies, more resources should be invested in innovative products;
- Obstacles to market uptake included use of second-hand and old equipment, absence of safety standards and guidelines for flammable climate-friendly technologies;

Capacity building:

- Capacity-building programmes for training technicians and strengthening enforcement skills of customs officers were instrumental to support implementation and decrease illegal trade;
- Importance of adopting an integrated approach to facilitating collaboration with customs by appointing a focal point. MOUs between different authorities also proved relevant to strengthening cooperation to prevent illegal trade;
- Technicians have shown unwillingness to attend voluntary training; implementing certification systems for RAC technicians accompanied by monitoring and enforcement schemes would make training mandatory.

Policy and regulatory framework:

- Coordination between ministries to implement import controls is also important to avoid incidents during the declaration process and issuance of import licences at checkpoints and reinforce control measures carried out by customs officers.

Agenda Item 9: Project Proposals

[Doc 93/35: UNDP's work programme amendments for 2023](#)

[Energy efficiency pilot project, Chile \(Project A5\)](#)

Document 93/35 contains a request for \$32,100 for the preparation of a pilot project using R-744 (CO₂) and R-717 (ammonia) in an integrated heat pump system for industrial refrigeration in Chile, to be implemented as part of the country's Stage I KIP. The objective would be to design, install and operate two applications with different heat and cooling capacities, in two independent but integrated projects in Chile's dairy industry, which currently relies on high-GWP HFC refrigerants.

EIA welcomes this proposal as it represents a significant opportunity within the context of Chile's HFC phase-down. Currently, the use of high-GWP HFCs in industrial refrigeration constitutes 34% of the country's total consumption in CO₂-eq terms. In addition, the proposed project sets a positive precedent, as heat pump systems are not yet prevalent in the industrial sectors of A5 countries, especially in combination with the use of CO₂ or ammonia.

[MAC demonstration project, India \(Project B1\)](#)

Document 93/35 also contains a request for \$32,100 for the preparation of a demonstration project showcasing the use of R-290 in the MAC manufacturing sector, as part of Stage I of the KIP for India. The project will demonstrate how smart microprocessor-based systems using a secondary coolant loop can maintain passenger cabin temperature, with the use of a battery pack for electric vehicles, allowing for the safe use of R-290 in MAC units.

It is particularly important that demonstration projects showcasing the safe use of natural refrigerants in important sectors are approved. EIA therefore firmly supports this proposal, which could lead the way for a significant future reduction in HFC-134a use in MAC manufacturing in India. EIA notes that a MAC demonstration project using R-1234yf was approved at the 92nd meeting of the Executive Committee, despite the already widespread use of this refrigerant in the MAC sector and multiple concerns regarding refrigerant costs, HFO production process emissions (including HFC-23) and PFAS pollution.

[Doc 93/38 World Bank's work programme amendments for 2023 Energy efficiency pilot project, Vietnam \(Project B2\)](#)

The World Bank has submitted a request for \$32,100 for the preparation of a pilot project to assist one manufacturer of split-type air-conditioning equipment in implementing a more energy-efficient design. The proposal suggests this would facilitate a revision of the current minimum energy standards for inverter-based room air conditioners in Vietnam.

Whilst the improvement of energy efficiency is an important goal, the Secretariat notes that the decision under which this proposal has been put forward (decision 91/65) specifically links energy efficiency pilot projects to the context of the HFC phase-down. EIA shares the Secretariat's concern that the proposed project does not address the phase-down, as the enterprise in question intends to continue using HFC-32, rather than converting to a low-GWP alternative. EIA notes that R-290 is a viable and available alternative for use in split-type air-conditioning equipment, and that pilot projects implementing conversions from HFC-32 to R-290 have approval precedent under decision 91/65.

[Doc 93/47: Energy efficiency pilot project, China](#)

The Government of China is requesting \$1,371,500 plus support costs, for a pilot project that aims to support two automotive manufacturers, producing small passenger vehicles and buses, in the design of R-744 (CO₂) based air-conditioning systems for electric vehicles (EVs). Under the project, it is proposed that 500 passenger cars and 50 buses would be manufactured using the developed R-744 systems. The Government of China has indicated that the proposed project would support the establishment of energy-efficiency standards and a labelling system for MAC installations in electric vehicles in the country. China will also ensure that the technical performance information and other outcomes of the project will be shared widely with the industry, and that training and technical support for different car manufacturers' technical

personnel would also be provided, thus providing the industry with a better understanding of CO₂ MAC technology and reducing the barriers related to its uptake.

EIA firmly supports this proposal and welcomes confirmation that China will include a component addressing HFC-134a in the MAC sector in Stage I of its KIP. The rapid growth of the EV market provides a clear opportunity for the development of efficient non-fluorinated HFC alternatives in the MAC sector, and CO₂ represents a sound choice for both reducing HFC consumption and for improving energy efficiency. Indeed, Sanden have stated that their CO₂ system increases driving range up to 50% in electric vehicles in winter conditions.⁴ Furthermore, pilot projects such as this will help to demonstrate viable alternatives to the increasingly prevalent HFO-1234yf, which is both itself a PFAS and which degrades to produce a large proportion of trifluoroacetic acid (TFA), another PFAS.

Doc 93/60: Conversion/demonstration and energy efficiency projects – India

Document 93/60 sets out several project proposals submitted on behalf of the Government of India. In the document, the Secretariat notes that India – as a Group II country – has not yet received project preparation funding for its KIP and is still developing a national strategy to phase down HFCs. Although strongly supportive of early action to phase down HFCs, EIA agrees with the Secretariat that it is consequently unclear how some of the activities proposed in document 93/60 might contribute to Stage I of India's KIP. To address this, EIA suggests that approval for any of the proposed projects (outlined below) must be contingent on a commitment by the Government of India to integrate the approved activities into the country's Stage I KIP when established.

Conversion/demonstration projects

The first project, proposed by UNDP on behalf of the Government of India, concerns the conversion of light commercial air-conditioning systems manufactured at Voltas Limited, from R-407C and R-410A to HFC-32. EIA questions the suggested benefits of this proposal. Although HFC-32 has a lower GWP than R-407C and R-410A, it has a GWP₁₀₀ of 749 and GWP₂₀ of 2,620 and cannot be considered a low-GWP refrigerant. Furthermore, EIA notes that conversions to HFC-32 have already taken place in India under the country's HPMP, including at the enterprise in question. In this context, future conversion projects intended to signal the importance of the upcoming HFC phase-down should instead embrace genuinely low- or zero-GWP alternatives.

The second submission made by UNDP on behalf of India is a proposal to convert food processing and cold storage equipment manufactured at Mech Air Industries from R-404A and R-407C to transcritical CO₂ heat pump technology. EIA supports this proposal, given that the project would help to signal natural refrigerants as viable alternatives in the food processing sector and demonstrate the technology's technical feasibility in hot and humid climates. At the same time however, EIA recognises the Secretariat's concerns that wider adoption of the technology could be challenging unless a comprehensive sectoral approach is set out in Stage I of India's KIP.

The third proposal, which EIA also supports, seeks to convert commercial refrigeration appliances manufactured at Rockwell Industries Limited from HFC-134a to R-290. The use of R-

⁴ Environmental Investigation Agency (2021). *Pathway to Net Zero Cooling Product List*, p23. Available at: <https://eia-international.org/wp-content/uploads/2021-Pathway-to-Net-Zero-Cooling-Product-List-SPREADS.pdf>

290 in commercial refrigeration applications is well established and an early and sustained transition to R-290 under India's KIP would help to limit the increase of HFC-134a servicing needs and HFC-134a banks resulting from continued growth in the commercial refrigeration sector. As such, EIA urges the Government of India to consider further activities supporting a swift transition in this sector when planning its overarching strategy for Stage I of the country's KIP.

Energy efficiency pilot projects

In connection with the conversion project at Rockwell Industries Limited, the Government of India has also requested funding for a pilot project to enhance the energy efficiency of the enterprise's converted equipment. EIA supports this additional proposal, noting that improvements achieved would be shared with other Article 5 countries.

The final proposal in document 93/60 is for a pilot project to design and develop energy-efficient rotary compressors and microchannel heat exchangers compatible with R-290 technology, for use in manufacturing of room air-conditioners at Godrej & Boyce Mfg. Ltd. (Godrej). The preparation for this project was approved at the 92nd meeting of the Executive Committee, receiving support from EIA at the time. In the present proposal, Godrej has re-confirmed its commitment to reducing its production of ACs using HFC-32 by up to 70% by 2028. Godrej has also stated that it intends to set up a manufacturing facility solely to produce R-290 compressors once the design and the prototype manufacturing is complete. EIA supports this proposal, which it is estimated will lead to 600,000 CO₂-eq tonnes of avoided emissions over the life of the improved equipment. In addition, EIA urges the Government of India to ensure that activities promoting R-290-based air-conditioning equipment are built into the overarching strategy of the country's Stage I KIP.

Kigali Implementation Plans

A total of 23 Stage I Kigali Implementation Plans (KIPs) are under consideration at the 93rd Executive Committee meeting. EIA welcomes these submissions and commends those countries proposing to reduce HFC consumption ahead of their required Montreal Protocol limits, ensuring they achieve a reduction in actual consumption.

Fourteen of the 23 submitted KIPs propose phase-down targets that would see HFC consumption in 2029 reduced below reported 2022 levels (see Table 3). Notable amongst these are the proposals of Jordan, Mexico and Ecuador, each of which seeks to reduce consumption from the 2022 level by more than 25% by 2029 (reductions of 30, 28 and 27% respectively). Unfortunately, nine of the submitted KIPs do not propose any reduction in actual consumption before the end of the decade, instead outlining targets for 2029 that exceed 2022 reported consumption. One country aims to more than double consumption in 2029, based on 2022 levels.

Proposed consumption under Stage I KIPs

Scientific analysis shows that the current phase-down schedules under the Kigali Amendment are not consistent with the UNFCCC Paris Agreement goal of limiting warming to 1.5°C by 2100.⁵

⁵ Purohit, P., et al.: Achieving Paris climate goals calls for increasing ambition of the Kigali Amendment, Nature Climate Change 12, 339-342, <https://doi.org/10.1038/s41558-022-01310-y>, 2022

While several countries are proposing to reduce HFC consumption ahead of the required Montreal Protocol limits, most countries with Stage I KIPs at this meeting are proposing to limit consumption at the baseline level until the required 10% reduction step in 2029.⁶ In many cases, this would allow considerable growth in HFCs even after a country's KIP is being implemented, and would result in a level of consumption at the conclusion of Stage I that is substantially higher than the country's actual consumption (based on reported data for 2022, the most recently reported year) (see Table 3).

Table 3: Comparison between reported 2022 consumption, and proposed HFC consumption in 2029 (CO₂-eq tonnes) Countries highlighted blue have proposed plans that reduce or limit consumption ahead of the minimum required for Montreal Protocol compliance.

Country*	HFC baseline	Reported consumption in 2022	Proposed HFC consumption in 2029	% difference between proposed consumption in 2029 and...	
				... baseline (%)	... consumption in 2022 (%)
Turkmenistan	597,121	256,793	537,409	-10%	+109%
Ghana	1,805,702	646,823	1,158,201	-36%	+79%
Grenada	52,815	29,700	47,534	-10%	+60%
Nicaragua	582,295	384,738	524,262	-10%	+36%
Viet Nam	13,991,360	10,727,091	12,592,224	-10%	+17%
Cambodia	1,263,376	972,813	1,137,038	-10%	+17%
Trinidad & Tobago	5,681,787	4,597,414	5,113,608	-10%	+11%
Cuba	1,030,662	882,672	927,596	-10%	+5%
Malawi	428,435	199,697	201,736	-53%	+1%
The Niger	1,222,358	813,172	792,662	-35%	-3%
Albania	883,849	816,384	795,464	-10%	-3%
Dominican Republic	3,834,089	3,713,933	3,450,785	-10%	-7%
The Congo	504,649	292,240	258,932	-49%	-11%
Peru	2,735,721	2,785,607	2,462,149	-10%	-12%
N. Macedonia	397,842	366,617	323,345	-19%	-12%
Malaysia	26,703,717	27,489,898	24,033,345	-10%	-13%
Chile	6,698,107	7,089,350	6,028,296	-10%	-15%
Panama	2,543,386	2,708,376	2,289,047	-10%	-15%
Kyrgyzstan	450,382	487,231	405,344	-10%	-17%
Bolivia	677,884	736,368	610,096	-10%	-17%
Ecuador	3,179,294	3,937,954	2,861,365	-10%	-27%
Mexico	76,982,664	95,644,142	69,284,397	-10%	-28%
Jordan	2,808,101	1,707,173	1,195,785	-57%	-30%

⁶ Baseline level referring to the HFC baseline agreed under the Kigali Amendment, i.e., average consumption for 2020-2022, plus 65% of HCFC baseline (in CO₂-eq).

As a result of the HCFC component included in the HFC baselines, the available room for a country to grow its HFC consumption without entering non-compliance varies widely.⁷ In one case, the HFC baseline is so inflated by the HCFC component that even the proposed 36% reduction from baseline still allows for a 79% increase in HFC consumption by 2029, based on reported consumption in 2022. EIA notes with concern that the HCFC component could inadvertently perpetuate through the HFC phase-down the negative impact of stockpiling during the HCFC baseline years. In this particular case, average HCFC consumption in the HCFC baseline years (2009-2010) was 179% higher than average HCFC consumption in the two preceding years (2007-2008). This explains at least in part why the HCFC component of the country's HFC baseline is so disproportionately high and provides further evidence of the disparity caused by the excessive HCFC component.

EIA recognises that some growth in HFC consumption may be unavoidable as countries' final HCFC phase-out stages are implemented, and that the impact of Covid may be playing a role. However, alternatives to HFCs are available in most sectors and as such, growth in sectors such as domestic and commercial RAC, where proven hydrocarbon and CO₂-based technologies exist, need not correlate to substantial growth in climate damaging HFCs. To ensure parity between Parties and the enactment of genuine restrictions on HFC growth, EIA firmly believes that KIP consumption limits should relate to a country's actual HFC use and demand.

Basing the KIP limits on average HFC consumption in the baseline years (2020-2022), whilst allowing some flexibility to account for reasonable and justified growth, would ensure that all Parties submitting KIPs are equally obliged to limit their HFC growth, and encouraged to take earlier action to avoid and reduce consumption of HFCs.

Stage I KIP activities: Strengthening the regulatory framework

Across the submitted KIPs, there is a consistent emphasis on strengthening regulatory frameworks to support the phase-down of HFCs. EIA supports these efforts, noting that without a strong licensing and quota system, supported by well-trained and equipped customs officials, effective enforcement of the HFC phase-down will be very challenging. EIA wishes to highlight support for proposals from the Congo and Ghana to use quota controls to restrict the import of high-GWP HFCs and HFC-based equipment, and in the case of the Congo, to promote the use of natural refrigerant alternatives. EIA urges other Parties to also consider how they could utilise their quota and licensing systems to ensure a faster transition away from HFCs.

In addition to the strengthening of quotas and licensing systems, EIA commends those countries proposing to introduce bans and restrictions on particularly damaging HFCs and HFC-based equipment. Notably, Cambodia is proposing to establish a ban on the import of second-hand HFC-based RAC equipment by 2027 and may also introduce a ban on the import of R-410A single split AC units. Meanwhile, Jordan will implement a ban on the manufacture and import of HFC-based domestic refrigeration equipment upon completing the conversion of its domestic refrigeration manufacturing lines, and Turkmenistan will conduct an assessment to determine a best approach for restricting or banning the import of HFC-based RAC equipment.

⁷ As a proportion of their total HFC baseline, the proportion made up by HCFC component ranges from 5% to more than 80% amongst Group I A5 Parties.

Stage I KIP activities: Training and capacity building

Training and capacity building activities also form a core component in each of the KIPs submitted to this meeting. Primarily the proposed training and capacity building activities focus on preparing technicians in the RAC servicing sector for the transition to natural refrigerants. In most cases proposed activities are intended to work in coordination with similar activities that are either ongoing or upcoming under the final stages of a country's HPMP. This coordination is important in helping to facilitate leapfrogging to HFC-free alternatives.

Training and capacity building activities, including the provision of equipment to training institutes, workshops, and industry associations, will be crucial during the implementation of Stage I KIPs. These activities will lay the groundwork for the safe transition away from HFCs to natural refrigerant alternatives. In that context, it is important for Parties to ensure that information on safety and best practice reaches all those who will be handling refrigerants, in both the formal and informal sectors. With regards to training and capacity building, EIA wishes to highlight Chile's Stage I KIP for the significant emphasis it places on strengthening national capacity for the safe and sustainable use of HFC alternatives in both the RAC servicing and MAC servicing sectors.

Stage I KIP activities: Banks management and disposal

Decision 91/66 of the Executive Committee established a funding window for preparation of national inventories of banks of used or unwanted substances and plans for their collection, transport and disposal beginning with ML93 and until MLF97.

At MOP35, Decision XXXV/11 was reached which encouraged parties to develop strategies to address life-cycle refrigerant management and requested ExCom to consider providing an additional funding window for countries who have completed their inventories and plans in accordance with decision 91/66.

It is encouraging that several countries have included activities in the KIP proposals relevant to recovery of refrigerants from equipment prior to disposal, or to increase domestic reclamation capacity. For example, several countries including Ecuador have included activities on strengthening their refrigerant recovery and reclaim (RRR) network. Grenada, meanwhile, has included activities for recovery of refrigerants from equipment dismantled in its proposed activities for maintaining energy efficiency in the RAC servicing sector.

It is also highly encouraging to see UNIDO's work programme amendments for 2023 (Document 93/37) include requests for preparation of national inventories of banks of used or unwanted substances and development of a national plan for 15 countries: Benin, Bolivia, Burkina Faso, Burundi, Cameroon, Ecuador, Guatemala, Honduras, Mexico, Montenegro, Nicaragua, North Macedonia, Togo, and Turkmenistan.

The activities in the funding requests for the 15 countries included regulatory assessments to identify needs to control unwanted ODS and HFC banks (13 countries); workshops and awareness raising; and the identification of costs for a sustainable model and financing modalities for implementation (six countries); establishment of a working group to assess unused or unwanted refrigerants, the life cycle of RAC equipment, and refrigerant emissions to the atmosphere; and the collection of banks and destruction tests in cement kilns or other approved technologies (five countries); economic feasibility study for destruction (four countries); technical and economic assessment of options for handling and disposal of waste-

controlled substances; and regional workshops for sharing experience with Central American countries (three countries); analysis of the installed capacities for destruction, transportation, storage of the banks and/or the need to create new collection centres and a survey on HCFC consumption per refrigerant used in the servicing sector and to collect sector-specific data for refrigerants through questionnaires and interviews (one country).

EIA supports approval of the preparatory funds for national inventories and banks and activities included in KIPs to provide complementary capacity building, and policy and institutional frameworks.

Stage I KIP activities: Demonstration projects

Among the Stage I KIPs submitted, there are a number of demonstration projects which EIA wishes to draw attention to, noting that such projects play an important role in awareness raising and encouraging the wider uptake of HFC-free technologies.

Air-conditioning projects

Both Malawi and the Niger are proposing demonstration projects to promote the adoption of R-290-based technology in air-conditioning units. At present, R-407C and R-410A air-conditioning units contribute more than 10% to total HFC consumption in each country (in CO₂-eq terms). EIA particularly supports Malawi's confirmation to the Secretariat that successful implementation of the project would be followed by stakeholder discussions on establishing a prohibition against high-GWP air-conditioning technologies. EIA commends Malawi for proposing these discussions and encourages the Niger to engage in a similar course of action following the successful implementation of its own demonstration project.

Commercial refrigeration projects

Further demonstration projects using R-290-based technology are proposed in the Stage I KIPs of Peru, Ghana, and Cambodia, in this case in the commercial refrigeration sub-sector. Peru's proposed project involves the design of an R-290-based cold room for demonstration and promotion purposes. In the country's first tranche however, activities are limited to the selection of end users to carry the project forward in the second tranche. In Ghana meanwhile, two proposed projects are intended to demonstrate R-290 monoblock technology in standalone refrigeration equipment. Both projects would be supported by awareness-raising activities and are intended to facilitate the establishment of a sustainable supply chain for R-290 equipment in the country.

Cambodia's project follows a slightly different course and would involve a comparative implementation approach. Half of the project's R-290-based condensing units would be installed as standard replacements for HFC units, operating under the same conditions as the units they are replacing, whilst the other half would be installed under optimized conditions (i.e., aligned with improved controls, new heat exchangers, and online monitoring). This unique approach will allow for a comparison of supply chain challenges, energy efficiency and other servicing conditions, and is proposed as a mechanism for informing future stages of the country's KIP.

Albania has proposed a demonstration project replacing the HFC-404A-based equipment in a supermarket with R-744-based alternatives. The project would be conducted in coordination with training of technicians and would be supported by an awareness raising campaign among end users. EIA encourages Albania to bring the project forward to the first tranche Stage I in

order to maximise its impact, noting the substantial contribution of HFC-404A in commercial refrigeration to the country's total consumption in CO₂-eq terms.

Finally, Mexico has proposed a suite of demonstration projects in the commercial refrigeration sector to take place during Stage I of its KIP. These include:

- a project for the introduction of ammonia and CO₂ in cascade and secondary loop systems for supermarket refrigeration;
- a project for the introduction of R-290 and CO₂ cascade and secondary loop systems for commercial refrigeration;
- a project to replace HFC-based AC chillers with chillers based on R-290 or ammonia; and
- a pilot project to reduce HFC use in the assembly of commercial refrigeration equipment at SMEs.

EIA supports each of these proposed projects, which showcase a number of natural refrigerant-based technologies. Additionally, EIA welcomes the assurance from UNIDO that, upon completion of these projects, the Government of Mexico will promote their replication throughout the full business chains of the beneficiary enterprises, as well as within other enterprises in the relevant sectors.

Stage I KIP activities: Manufacturing projects

Ecuador

Ecuador has only one HFC consuming manufacturing enterprise, Induglob, a producer of stand-alone commercial refrigerators. No action is proposed in relation to Induglob under Ecuador's KIP as the company is already converting from HFC-134a to R-600a and R-290 with MLF assistance. Upon completion of this conversion, a ban on the import and manufacturing of domestic refrigerators using HFC-134a will enter into force.

Cuba

Under its Stage I KIP, Cuba is proposing investment projects in four RAC manufacturing enterprises and one PU foam manufacturing enterprise, however the substantive content of these investment projects has not yet been formulated. UNDP, as the implementing agency, have explained this is due to the lack of agreed cost guidelines for the sectors, and the fact that the enterprises were still recovering from an economic slowdown associated with the Covid-19 pandemic. The Secretariat has therefore recommended that during the implementation of Stage I of its KIP, the Government of Cuba should be allowed to submit investment projects in the RAC sector on an exceptional basis.

EIA appreciates this recommendation by the Secretariat and encourages the Government of Cuba to submit its investment project proposals at the earliest opportunity, to maximise the benefits achieved by converting its RAC and foam manufacturing enterprises. EIA also strongly urges Cuba to take early action to transition away from the use of HFC-134a in MDI manufacturing, noting that the country's single MDI manufacturing enterprise accounted for 76% of the total manufacturing sector's HFC consumption in 2022 (in mt terms).

Mexico

The Government of Mexico are proposing to completely phase out the use of HFCs from the country's PU foam manufacturing sector within Stage I of their KIP. Once the phase-out is

complete, by 1 January 2029, the Government have committed to issuing a ban on the import and use of HFCs (including in pre-blended polyols) for the manufacturing of PU foam.

While EIA welcomes this commitment, we urge the Government of Mexico to reconsider the selection of HFOs as the technology of choice for carrying out this conversion. There is growing concern over the negative environmental and health implications associated with PFAS, and increasing the use of HFO-1233zd at the scale proposed under the Government of Mexico's plan would contribute significantly towards this. EIA strongly urges the Government of Mexico to pursue the conversion of the country's foam sector using hydrocarbon alternatives instead of HFOs, noting that UNIDO have indicated within the country's Stage I KIP proposal that hydrocarbon alternatives are locally available for this purpose.

EIA notes that PU foam accounts for only 2.3% of Mexico's total HFC manufacturing consumption in CO₂-eq terms. Although achieving a phase-out in this sector would be a laudable step, EIA encourages the Government of Mexico to consider take further action under Stage I of the KIP to phase-down consumption in its highest consuming manufacturing sectors, notably air-conditioning (53% of total CO₂-eq consumption) and commercial refrigeration (22.7% of total CO₂-eq consumption). These highest-consuming sectors are also sectors in which natural refrigerant-based technologies offer proven alternatives. An early transition of air-conditioning and commercial refrigeration equipment manufactured in the country would not only support the phase-down of HFCs in Mexico itself, but also in the countries to which the RAC equipment it produces is exported.

Jordan

The Government of Jordan is proposing a series of investment projects to phase out the use of 266,490 CO₂-eq tonnes of HFCs at six RAC enterprises across the domestic refrigeration, commercial refrigeration, and residential AC subsectors. The enterprises manufacturing domestic refrigerators will convert to HC-600a; enterprises manufacturing commercial refrigeration equipment will convert to HC-290; and those manufacturing residential AC to HFC-32.

EIA commends the proposed conversions to HC-600a and HC-290 and welcomes the commitment by the Government of Jordan to implement a ban on the manufacture and import of HFC-based domestic refrigeration equipment upon completion of the conversion in this sector. In the residential AC subsector however, EIA urges the Government of Jordan to consider an alternative to the use of HFC-32, noting that, with a GWP₁₀₀ of 749 and GWP₂₀ of 2,620, it is not a low-GWP refrigerant. Converting to an HFC alternative would pave the way for Jordan to secure a complete phase-out of HFCs in its manufacturing sector under future stages of its KIP, and EIA encourages the Government to embrace this opportunity to the fullest extent.

HCFC Phase-out Management Plans

A total of six Stage II and Stage III HCFC phase-out management plans (HPMPs) are submitted for approval at the 93rd Executive Committee meeting. EIA welcomes each of these submissions, which will see HCFC consumption phased-out in Guinea, Suriname, Lebanon and the Philippines by 2030.

Guinea, Stage II HPMP

The Government of Guinea is proposing a Stage II HPMP that will completely phase-out HCFC consumption by 2030. Guinea is requesting a total of US \$468,080 to fund this Stage II plan,

consisting of US \$420,000 in project costs, plus agency support costs of US \$33,410 for UNEP and US \$14,670 for UNIDO.

Notable in the proposal are commitments by the Government of Guinea to enact a total ban on the import of new and used HCFC-based equipment by 1 January 2027; a revised code of good practices for RAC technicians by 1 January 2027; mandatory recovery of HCFCs during RAC equipment servicing by 1 January 2028; a mandatory certification scheme for RAC technicians by 1 January 2028; and mandatory leakage checks for larger RAC equipment in the commercial and industrial sectors by 2028. EIA supports these measures and welcomes the advice from UNEP that the country may not require any HCFCs for its servicing needs after 2030 following the complete phase-out.

Mozambique, Stage II HPMP

The Government of Mozambique has submitted a Stage II HPMP, which also seeks to completely phase-out HCFC consumption by 2030. For this, Mozambique is requesting a total of US \$825,501, consisting of US \$737,500 in project costs, plus US \$89,001 in agency support costs for UNDP.

Mozambique is proposing to further control the supply of HCFCs by strengthening enforcement of its ODS regulations; developing and implementing national technical standards in the RAC sector; and preparing a RAC technician certification scheme. Mozambique has also proposed additional activities intended to address energy efficiency in the RAC servicing sector, which EIA supports, noting the Secretariat's comment that these activities will enhance the adoption of low-GWP and energy efficient technologies in the country. EIA also welcomes the confirmation by UNEP that Mozambique's monitoring systems to control HCFC imports post-2030 are already in place and appreciates the proposed activities to further strengthen these systems during the implementation final HPMP stage.

Suriname, Stage II HPMP

The Government of Suriname is also proposing a Stage II HPMP to completely phase-out HCFC consumption by 2030. For this, Suriname is requesting a total of US \$603,036, consisting of US \$540,000 in project costs, plus agency support costs of US \$46,917 for UNEP and US \$16,119 in support costs for UNIDO.

Under this final stage of the HPMP, Suriname is proposing to further control the supply of HCFCs by strengthening its regulations and banning the import and sale of HCFC-based RAC equipment from 1 January 2025. Also proposed are further training activities for refrigeration technicians; the implementation of a recovery programme for HCFCs; and a series of awareness and outreach programmes promoting the adoption of low-GWP alternative technologies. EIA supports Suriname's efforts to promote low-GWP alternatives through its proposed training and awareness raising activities, as well as its proposed activities to develop good service practices in the recovery and reuse of refrigerants.

Lebanon, Stage III HPMP

The Government of Lebanon has submitted a Stage III HPMP, which also seeks the complete phase-out HCFC consumption by 2030. For this, Lebanon is requesting a total of US \$1,265,489, consisting of US \$1,182,700 in project costs, plus agency support costs of US \$82,789 for UNDP.

EIA notes with concern that Lebanon reported ongoing consumption of HCFC-22 at a refrigeration manufacturing enterprise in 2022. This was unexpected, as all HCFC use for

manufacturing was supposed to have been phased out under the previous stage of the country's HPMP. Although EIA appreciates that a ban on HCFC-22 in local manufacturing will enter into force from 31 December 2025, we share the concerns flagged by the Secretariat around this issue. EIA supports the Secretariat's recommendation that technical assistance should be provided to assist the enterprise in phasing out its remaining HCFC line, but that the Government of Lebanon should incorporate the overall phase-out of the enterprise, which primarily uses HFCs, into Stage I of its KIP.

The Philippines, Stage III HPMP

Another Stage III HPMP targeting the complete phase-out HCFC consumption by 2030 has been submitted by the Government of the Philippines. For this, the Philippines is requesting a total of US \$5,015,090, consisting of US \$4,687,000 in project costs, plus agency support costs of US \$328,090 for UNIDO.

Under the Stage III HPMP, the Government of the Philippines' will commit to banning the import, manufacture and installation of HCFC-123-based chillers by 1 January 2026, and the import, assembly and manufacture of HCFC-123-based fire suppression and fire protection equipment by 1 January 2030. EIA welcomes these steps and appreciates the efforts that the Government of the Philippines and UNIDO have made to address a number of technical concerns raised by the Secretariat.

Where EIA would urge caution, however, is with regards to ongoing discussions that have been flagged between the Government of the Philippines and Tradewater – a carbon trading company – to arrange final disposal of used HCFCs and HFCs collected at a facility which has received support under previous stages of the country's HPMP. EIA has strong concerns about the role of carbon trading in financing ODS banks' destruction for multiple reasons, including:

- the significant disparity between the money paid to developing countries (if any) for the gas and the substantial profits generated from the sale of credits on the voluntary carbon market;
- the weakness of 'additionality' as a precondition to justify the generation of carbon credits from ODS destruction, and the even weaker case for justifying the generation of credits from the destruction of HFCs;⁸ and
- the potential for carbon credits to lead to unintended consequences, noting the previous failure of carbon markets in tackling emissions of HFC-23.

EIA supports the Government of the Philippines' ongoing efforts to recover used refrigerants but urges it to consider alternative options for addressing the country's banks so that their destruction is not used to justify equivalent emissions elsewhere through the sale of carbon credits.

⁸ Additionality refers to the extent to which a carbon credit represents a definite and real-terms avoidance of CO₂-eq emissions. To satisfy the 'additionality' criterion, a project must; 1) lead to the avoidance of quantifiable emissions that would have occurred if not for the intervention, and 2) not have been possible without the revenue generated from selling the associated credits.

Agenda Item 10: Kigali Amendment Matters

Docs 93/96 and 93/97: Cost Guidelines including the Starting Point

In paragraph 10 of decision XXVIII/2 the Parties requested the Executive Committee to develop, within two years of the adoption of the Amendment, guidelines for financing the phase-down of HFC consumption and production, including cost-effectiveness thresholds. These guidelines are now long overdue and with the freeze set to begin in 2024 for Group I A5 Parties, and a significant number of KIPs now being submitted for approval, the need for ExCom to complete its work could not be more urgent.

Following an agreement on funding levels for the HFC phase-down in the RAC servicing sector at the 92nd meeting earlier this year, the key remaining issues to resolve are:

- The starting point for sustained aggregate reductions in HFC consumption;
- Incremental Operating Costs (IOCs) and their duration;
- Energy efficiency; and
- Disposal.

On the issue of the starting point, EIA urges Parties to consider the mechanism provided by the Secretariat in document 92/46, reissued to this meeting as document 93/97.

The Secretariat's proposal takes into account the replacement of high-GWP HFCs by lower-GWP HFC alternatives while also addressing the fundamental question of whether the measurement used to establish the national starting point should be in metric tonnes or CO₂-eq tonnes. While recognising some benefits to the mt approach, the analysis favours the use of tCO₂-eq, highlighting the flexibility that it offers to Article 5 countries. It does this by accounting for total HFC consumption in both mt and tCO₂-eq when calculating agreed cost-effectiveness, relying on conversion between US \$/kg (used to determine levels of funding) and US \$/tCO₂-eq (used to calculate cost-effectiveness) to do so. Low volume consuming (LVC) countries and non-low volume consuming (non-LVC) countries are addressed separately under the possible mechanism with manufacturing consumption separated out from servicing consumption in countries where both exist. Funding would thereafter be determined as follows:

	Servicing Sector (US \$/tCO ₂ -eq)	Manufacturing Sector (US \$/tCO ₂ -eq)
LVC	Funding determined by the table for LVC countries and the target to be met	Funding determined in line with past practice, i.e., eligible incremental costs or, if a cost effectiveness threshold is established, the lower of the product of the enterprise's consumption and the agreed cost-effectiveness threshold or the eligible incremental costs.
Non-LVC	Agreed cost-effectiveness threshold (CE) converted into US \$/tCO ₂ -eq based on the country's HFC consumption in the baseline year. Funding = CE X agreed CO ₂ -eq tonnes reduced	

EIA reaffirms its broad support for this possible mechanism as it aligns with the HFC phase-down in terms of measurement and past practice, which has been on the whole very effective. However, EIA believes that ExCom must also consider how to incentivise the one-time transition to low-GWP and zero-GWP technologies and equipment, in particular those relying on natural refrigerants, rather than encouraging the phase-in of lower-GWP HFC/HFO blends.

EIA also rejects the suggestion that the starting point figure should be based on a country's HFC baseline for consumption, instead suggesting that Parties consider basing the starting point on actual consumption during the baseline years, allowing for a reasonable percentage increase,

where justified, to account for unavoidable HFC growth. As flagged in EIA's recommendations on submitted KIPs, the degree to which the HFC baselines reflect actual consumption varies widely due to the HCFC component. To ensure parity between Parties, and to secure ambitious efforts to limit the growth and reduce the consumption of HFCs, a starting point that reflects actual consumption, and does not permit unconstrained growth due to past high HCFC baselines, should be agreed.

Agenda Item 12: Monitoring, Reporting, Verification and Enforcement

Doc 93/102: Overview of current monitoring, reporting, verification and enforceable licensing and quota systems developed with MLF support

The MLF can play a more active role in ensuring effective licensing and quota systems are in place in A5 Parties. This is particularly important given the risks of illegal diversion and trade in HCFC-22 under the HCFC phase-out and the potential for significant HFC illegal trade with the entry into force of the freeze under the HFC phase-down.

The enforcement challenge facing A5 Parties should not be underestimated as there are a number of new challenges. For example, the Kigali Amendment mandates a phase-down, not a phase-out, with four separate phase-down schedules rather than two phase-out schedules. The CO₂-eq metric brings added complexities, with a much larger number of pure HFC chemicals and a proliferation of HFC blends with vastly varying GWPs. Finally, A5 Parties are undertaking the HFC phase-down simultaneously with the HCFC phase-out, which brings unique challenges to these Parties.⁹

At the one-day workshop on strengthening the effective implementation and enforcement, which took place just before OEWG-45, the opportunity to introduce new mechanisms to improve monitoring, reporting, verification and enforcement (MRV+E) in the context of the HFC phase-down was underscored multiple times. In terms of key points, participants raised the importance of: (i) common features and minimum requirements for licensing and quota systems; (ii) collaboration among different agencies and industry stakeholders; (iii) risk management, such as heightened oversight of free trade zones; and (iv) bans on non-refillable cylinders; among others.

In light of the above, and in the context of ongoing KIP development, the MLF can do more to support A5 Parties. In particular, ExCom should request implementing agencies to work with governments to identify new mechanisms to improve their licensing and quota systems during KIP development, focusing on the key points above, and thereafter make support available for that purpose. In addition, ExCom should request the MLF secretariat, in consultation with implementing agencies and with input from both A5 and non-A5 Parties, to identify potential common features and minimum requirements for licensing and quota systems. Lastly, given the importance of regional coordination of customs and other government enforcement initiatives in tackling illegal trade, ExCom should consider how the role of regional ozone networks can be utilised to further support this coordination in A5 countries.

⁹ See EIA submission to MOP34 on Institutional processes of the Montreal Protocol. Available at: <https://online.ozone.unep.org/t/institutional-processes-of-the-mp-list-of-ideas/866>

Annex 1: Countries with remaining HCFC Consumption not addressed by an approved HPMP

Country	Baseline (ODP Tonnes)	Control addressed by HPMPs	Remaining unaddressed consumption from baseline (ODP Tonnes)
Afghanistan	23.6	67.5% by 2025	7.67
Albania	6	67.5% by 2025	1.95
Algeria	62.1	20.0% by 2017	49.68
Angola	16	67.5% by 2025	5.20
Argentina	400.7	50.0% by 2024	200.35
Armenia	7	66.6% by 2020	2.34
Bahrain	51.9	73.5% by 2025	13.75
Bangladesh	72.6	67.5% by 2025	23.60
Brazil	1,327.3	45.0% by 2021	730.02
Burundi	7.2	35.0% by 2020	4.68
Cameroon	88.8	75.0% by 2025	22.20
China	19,269.0	76.0% by 2026	4,624.56
Comoros (the)	0.1	35.0% by 2020	0.07
Congo (the)	10.1	35.0% by 2020	6.57
Costa Rica	14.1	97.5% by 2030	0.35
Cote d'Ivoire	63.8	35.0% by 2020	41.47
Democratic People's Republic of Korea (the)	78	15.0% by 2018	66.3
Djibouti	0.7	35.0% by 2020	0.46
Dominica	0.4	35.0% by 2020	0.26
Egypt	386.3	70.0% by 2025	115.89
Equatorial Guinea	6.3	35.0% by 2020	4.10
Gabon	30.2	35.0% by 2020	19.63
Guinea	22.6	35.0% by 2020	14.69
Guinea Bissau	2.8	35.0% by 2020	1.82
Iran (Islamic Republic of)	380.5	75.0% by 2023	95.13
Iraq	108.4	69.0% by 2025	33.60
Jordan	83	50.0% by 2022	41.50
Kuwait	418.6	67.5% by 2025	136.05
Lebanon	73.5	75.0% by 2024	18.38
Libya***	118.4	80.5% by 2027	23.09
Malaysia	515.8	42.9% by 2022	294.52
Mali	15	35.0% by 2020	9.75
Mauritania	20.5	67.5% by 2025	6.66
Mexico	1,148.80	67.5% by 2023	373.36
Morocco	51.4	67.5% by 2025	16.71
Mozambique	8.7	35.0% by 2020	5.66

Country	Baseline (ODP Tonnes)	Control addressed by HPMPs	Remaining unaddressed consumption from baseline (ODP Tonnes)
Myanmar	4.3	35.0% by 2020	2.80
Nigeria	344.9	67.5% by 2025	112.09
Peru	26.9	67.5% by 2025	8.74
Philippines (the)	162	50.0% by 2021	81
Qatar	86.9	67.5% by 2026	28.24
Saint Kitts and Nevis	0.5	35.0% by 2020	0.33
Sao Tome and Principe	2.2	35.0% by 2020	1.43
Saudi Arabia	1,468.70	40.0% by 2020	881.22
Senegal	36.2	81.1% by 2025	6.84
Serbia	8.4	67.5% by 2025	2.73
Somalia	45.1	35.0% by 2020	29.32
South Sudan	4.1	35.0% by 2024	2.67
Suriname	2	35.0% by 2020	1.3
Syrian Arab Republic	135	67.5% by 2025	43.88
Thailand	927.6	61.8% by 2023	354.34
Timor Leste	0.5	78.0% by 2025	0.11
Tunisia	40.7	67.5% by 2025	13.23
Turkmenistan	6.8	67.5% by 2025	2.21
Viet Nam	221.2	35.0% by 2022	143.78