



**United Nations
Environment
Programme**

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/95/65
6 November 2024

ORIGINAL: ENGLISH



EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-fifth Meeting
Montreal, 4-8 December 2024
Item 9(d) of the provisional agenda¹

PROJECT PROPOSAL: MAURITIUS

This document consists of the comments and recommendation of the Secretariat on the following project proposal:

Phase-down

- | | | |
|---|---------|-----------------------------|
| • Kigali HFC implementation plan (stage I, first tranche) | Germany | Individual
consideration |
|---|---------|-----------------------------|

¹ UNEP/OzL.Pro/ExCom/95/1

Pre-session documents of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol are without prejudice to any decision that the Executive Committee might take following issuance of the document.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Mauritius

PROJECT TITLE	AGENCY
Kigali HFC implementation plan (stage I)	Germany (lead)

LATEST ARTICLE 7 DATA (Annex F)	Year: 2023	225.08 mt	530,740 CO ₂ -eq tonnes
---------------------------------	------------	-----------	------------------------------------

SECTORAL HFC CONSUMPTION DATA (CO ₂ -eq tonnes) AND ACTIVITIES									
	Aerosol	Foam	Fire-fighting	AC and refrigeration				Solvent	Other
				Manufacturing			Servicing		
				Refrigeration	AC	Other			
Latest CP report (2023)							530,740		
KIP stage I activities as agreed (Y/N)							Y		

AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING	177.74 mt	496,774 CO ₂ -eq tonnes
--	-----------	------------------------------------

BASELINE CONSUMPTION DATA (CO ₂ -eq tonnes)	2020	2021	2022	Average 2020-2022
HFC annual consumption	503,851	336,000	650,471	496,774
HCFC baseline (65%)				169,182
HFC baseline				665,957

HFC CONSUMPTION ELIGIBLE FOR FUNDING	
Starting point for sustained aggregate reductions	n/a
Previously approved HFC phase-down investment projects	No
Aggregate reductions from previously approved projects (CO ₂ -eq tonnes)	n/a

PROJECT DATA AS AGREED			2024*	2025	2026	2027	2028	2029	Total
Consumption (CO ₂ -eq tonnes)	Montreal Protocol limits		665,957	665,957	665,957	665,957	665,957	599,361	n/a
	Maximum allowable		665,957	665,957	665,957	665,957	665,957	599,361	n/a
	Maximum allowable (%)		100	100	100	100	100	90	n/a
Amounts recommended in principle (US \$)	Germany	Project costs	103,000	0	0	87,000	0	0	190,000
		Support costs	13,390	0	0	11,310	0	0	24,700
	Total project costs		103,000	0	0	87,000	0	0	190,000
	Total support costs		13,390	0	0	11,310	0	0	24,700
	Total funds		116,390	0	0	98,310	0	0	214,700

* Recommended for approval at the present meeting

Reduction from remaining consumption eligible for funding stage I in CO ₂ -eq tonnes	n/a
---	-----

Secretariat's recommendation:	Individual consideration
-------------------------------	--------------------------

PROJECT DESCRIPTION

1. The present document contains the following sections:
 - I. Summary of the proposal as submitted
 - II. Background: Implementation status of the country's HCFC phase-out management plan and previous HFC-related projects
 - III. HFC consumption: Overview of the country's HFC consumption levels, trends, and sectoral uses
 - IV. Stage I of the Kigali HFC implementation plan, as submitted: Overarching strategy and plan of implementation for the first tranche
 - V. Secretariat's comments, including the agreed cost of activities
 - VI. Recommendation

I. Summary of the proposal as submitted

2. On behalf of the Government of Mauritius, the Government of Germany as the designated implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), in the amount of US \$325,000, plus agency support costs of US \$42,250, as originally submitted.²
3. The implementation of stage I of the KIP will assist the Government of Mauritius in meeting the target of 10 per cent reduction from its HFC baseline consumption by 1 January 2029.
4. The first tranche of stage I of the KIP being requested at this meeting amounts to US \$169,000, plus agency support costs of US \$21,970 for the Government of Germany, as originally submitted, for the period of January 2025 to December 2027.

II. Background

Status of implementation of the HCFC phase-out management plan

5. Table 1 presents information on the HCFC phase-out management plan (HPMP) in Mauritius as of November 2024.

Table 1. HPMP implementation status for Mauritius

	Stage I
Meetings when HPMP was approved/updated	63 rd , 72 nd , 93 rd
Reduction from baseline	100% by 2030
Total project cost (US \$)	1,070,000
Date of completion (actual/planned)	31 December 2031

Status of implementation of previous HFC-related activities

6. Table 2 presents an overview of activities implemented in Mauritius in the context of the Kigali Amendment that have been funded by the Multilateral Fund.

² As per the letter of 12 August 2024 from the Ministry of Environment, Solid Waste Management and Climate Change (Environment and Climate Change Division) of Mauritius to the Secretariat.

Table 2. Previously approved HFC-related activities in Mauritius

Approval meeting	Project title	Implementing agency	Cost (US \$)	Date of completion
75 th	Survey of ODS alternatives	Germany	70,000	May 2017
82 nd	Enabling activities for HFC phase-down	UNEP	150,000	December 2021

III. HFC consumption overview

HFC consumption levels

7. Mauritius only imports HFCs for use in the servicing sector. The most consumed substances in 2023 were R-404A (44.0 per cent of total HFC consumption in CO₂-equivalent (CO₂-eq) tonnes), R-410A (24.5 per cent), HFC-134a (20.4 per cent), R-507C (5.6 per cent), and other HFCs (5.6 per cent). Table 3 presents the country's HFC consumption as reported to the Ozone Secretariat under Article 7 of the Montreal Protocol.

Table 3. HFC consumption in Mauritius (2019–2023 Article 7 data)

HFC	GWP	2019	2020	2021	2022	2023
Metric tonnes (mt)						
HFC-134a	1,430	42.81	43.51	37.96	33.78	75.70
HFC-23	14,800	1.70	0.85	0.05	2.03	0.15
HFC-32	675	0.89	0.03	0.29	2.89	1.48
R-404A	3,922	84.28	74.73	40.40	109.08	59.52
R-407C	1,774	6.18	3.80	2.88	2.96	3.39
R-410A	2,088	60.81	55.13	46.46	51.08	62.27
R-442A	1,888	0.00	0.00	0.00	1.65	1.38
R-449A	1,396	0.00	1.50	0.03	0.00	3.35
R-507C	3,985	0.00	0.00	3.96	6.86	7.46
Others		8.08	10.16	1.13	0.00	10.39
Total (mt)		204.75	189.70	133.14	210.34	225.08
CO₂-eq tonnes						
HFC-134a	1,430	61,218	62,219	54,278	48,310	108,245
HFC-23	14,800	25,160	12,580	681	30,103	2,264
HFC-32	675	601	19	192	1,947	999
R-404A	3,922	330,512	293,042	158,433	427,774	233,423
R-407C	1,774	10,962	6,735	5,110	5,252	6,013
R-410A	2,088	126,941	115,084	96,988	106,636	129,992
R-442A	1,888	0	0	0	3,115	2,596
R-449A	1,396	0	2,094	35	0	4,677
R-507C	3,985	0	0	15,781	27,334	29,720
Others		32,199	12,078	4,503	1	12,808
Total (CO₂-eq tonnes)		587,594	503,851	336,000	650,471	530,740

Established HFC baseline

8. The Government of Mauritius reported the Article 7 data for 2020-2022. The country's HFC consumption baseline was established at 665,957 CO₂-eq tonnes by adding 65 per cent of its HCFC baseline (expressed in CO₂-eq tonnes) to its average HFC consumption in 2020-2022, as shown in table 4.

Table 4. HFC baseline calculation for Mauritius (CO₂-eq tonnes)

Baseline calculation components	2020	2021	2022
HFC annual consumption	503,851	336,000	650,471
HFC average consumption in 2020-2022			496,774
HCFC baseline (65%)			169,182
HFC baseline			665,957

Country programme implementation report

9. The sectoral HFC consumption data provided by the Government of Mauritius in its country programme (CP) implementation report for 2023 is consistent with the data reported under Article 7 of the Montreal Protocol.

10. However, the sectoral HFC consumption data provided in the CP implementation report for 2020 presents minor inconsistencies with the data reported under Article 7. Specifically, consumption of 0.45 mt, 4.32 mt and 1.50 mt of R-417A, R-448A and R-449A, respectively, was reported under Article 7, whereas no consumption was reported for these substances under the 2020 CP implementation report. The Government of Germany is working with the country to submit a revised CP data for 2020 to the Fund Secretariat.

HFC consumption trends

11. Mauritius has been reporting HFC data since 2018. A drop in its HFC consumption pattern was noted in 2020 and 2021, owing to reduced economic activity during the COVID-19 pandemic. This resulted in an average consumption in 2020-2022 of 177.74 mt, which is 15 per cent below the 2019 import figures of 204.75 mt. It is likely that the subsequent consumption increase in 2022 occurred to compensate for the limited activity during the pandemic years. HFC consumption increased in 2023 largely as a result of the resumption of economic activities after the pandemic. Based on inputs received from the industry during the KIP survey, HFC consumption is expected to follow a steadier pattern in 2024 and beyond, as anomalies from the pandemic years are adjusted.

HFC consumption by sector

12. HFCs are mainly consumed for servicing in commercial refrigeration (34.2 per cent in mt and 44.4 per cent in CO₂-eq tonnes), followed by industrial refrigeration (31.7 per cent in mt and 34.4 per cent in CO₂-eq tonnes), commercial air-conditioning (14.3 per cent in mt and 9.1 per cent in CO₂-eq tonnes), and other subsectors, as shown in tables 5 and 6.

Table 5. HFC consumption in Mauritius in the refrigeration and AC servicing subsectors in mt (2022)

Sector		HFC-134a	HFC-32	R-404A	R-407C	R-410A	R-507C	HFC-23*	R-442A	R-449A	Total	Share of total (%)
Refrigeration and AC servicing												
Refrigeration subsectors												
Domestic		0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.1
Commercial	Stand-alone units	2.91	0.00	1.62	0.00	0.00	0.00	2.03	0.00	0.00	6.56	3.1
	Condenser units	2.47	0.00	37.87	0.00	0.00	0.00	0.00	0.00	0.03	40.37	19.2
	Centralized systems	0.00	0.00	23.40	0.00	0.00	0.69	0.00	0.99	0.00	25.08	11.9
Industrial		11.29	0.00	44.31	2.69	1.66	6.17	0.00	0.66	0.00	66.78	31.7
Transport		0.00	0.00	1.88	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.9
Air-conditioning subsectors												
Residential		0.00	1.44	0.00	0.00	23.17	0.00	0.00	0.00	0.00	24.61	11.7
Commercial		2.11	1.45	0.00	0.27	26.25	0.00	0.00	0.00	0.00	30.08	14.3
Mobile		14.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.71	7.0
Total		33.78	2.89	109.08	2.96	51.08	6.86	2.03	1.65	0.03	210.36	100

* HFC-23 is used in low-temperature laboratory applications.

Table 6. HFC consumption in Mauritius in the refrigeration and AC servicing subsectors in CO₂-eq tonnes (2022)

Sector		HFC-134a	HFC-32	R-404A	R-407C	R-410A	R-507C	HFC-23	R-442A	R-449A	Total	Share of total (%)
Refrigeration and AC servicing												
Refrigeration subsectors												
Domestic		415	0	0	0	0	0	0	0	0	415	0.1
Commercial	Stand-alone units	4,161	0	6,354	0	0	0	30,044	0	0	40,559	6.2
	Condenser units	3,532	0	148,526	0	0	0	0	0	42	152,100	23.4
	Condenser units	0	0	91,775	0	0	2,750	0	1,869	0	96,394	14.8
Industrial		16,145	0	173,784	4,772	3,465	24,587	0	1,246	0	223,999	34.4
Transport		0	0	7,373	0	0	0	0	0	0	7,373	1.1
Air-conditioning subsectors												
Residential		0	972	0	0	48,367	0	0	0	0	49,339	7.6
Commercial		3,017	979	0	479	54,797	0	0	0	0	59,272	9.1
Mobile		21,035	0	0	0	0	0	0	0	0	21,035	3.2
Total		48,305	1,951	427,812	5,251	106,630	27,337	30,044	3,115	42	650,487	100

Refrigeration and air-conditioning servicing sector

13. There are approximately 2,500-3,000 technicians and 800 workshops consuming HFCs in Mauritius.

14. Under the current regulatory framework, the licensing, certification and periodic upskilling of refrigeration and air-conditioning (RAC) technicians are not required for servicing RAC equipment. The industry's stakeholders have expressed the need to address this lack, as it would ensure safe and effective servicing of the equipment.

*Domestic, commercial, industrial and transport refrigeration servicing**Domestic refrigeration*

15. Domestic refrigeration equipment account for the majority of the RAC equipment. Approximately 439,000 domestic refrigerators are in use, of which about 40 per cent are HFC-134a-based while the remaining are based on R-600a. Currently, most of the retailers are selling R-600a-based domestic refrigerators, which are expected to replace HFC-134a-based refrigerators at the end of their useful life. This sector's annual HFC consumption is minimal (approximately 0.3 mt).

*Commercial refrigeration**Stand-alone*

16. Stand-alone units represent the majority of imported commercial refrigeration equipment and are generally used for display and sale of food and beverages. Their quantity experienced an average growth rate of approximately 5 per cent from 2017 to 2021. Despite the challenges posed by the COVID-19 pandemic in 2020 and 2021, there was not a significant decline in the importation of these equipment, though a significant decrease in import volume was observed in 2022. HFC-23 is used in vaccine coolers. R-404A and HFC-134a emerge as the primary HFCs in this subsector while R-600a and R-290 use has been slowly increasing. About 6.56 mt of HFCs are used in this application.

Condensing units

17. The condensing units are predominantly used for cooling small and medium cold rooms in supermarket settings, convenience stores and restaurants and have cooling capacities typically ranging from 1.5 kW to 25 kW. The predominant refrigerants used are R-404a and HFC-134a. It is difficult to estimate the number of units imported and installed as they are scattered across the country; they experience high leakage rates due to prevalent maintenance and usage practices. Moreover, many service companies assemble and install these condensing units, which involves incorporating the initial refrigerant charge into the total HFC use by this subsector. About 40.37 mt of HFCs, mainly R-404A, are used in these categories of equipment.

Centralized commercial equipment

18. According to the installers, a recent trend has emerged where supermarket owners personally import refrigerated cabinets and, in some cases, all the equipment. The installers either import only for the centralized refrigeration plants or are solely involved in the installation process in certain cases. While the volume of imported equipment may not be substantial, there has been an increase in the number of installed centralized systems from 2016 to 2019 due to the replacement of installations in the existing supermarkets and the installation in new supermarkets.

19. The vast majority of centralized systems installed in supermarkets, both for medium and low temperatures, are operating with R-404A. A few supermarkets and hypermarkets operating under international franchises have transitioned to low-global-warming-potential (GWP) HFC/HFO blends, namely R-448A or R-449A. About 25.08 mt of HFCs are consumed in this application.

Industrial refrigeration

20. Industrial refrigeration refers to various equipment types, including centralized systems, cold rooms, blast freezers utilized in food manufacturing, fish processing facilities, and cold storage warehouses. Although some equipment applicable to the medical/pharmaceutical sector was identified in customs data, the import volume remains relatively small.

21. Cooling capacities of the equipment used in processing plants and warehouses range from 10 kW to 1,424 kW for large distributed systems employed in cold storage warehouses. While routine maintenance and minor repairs are typically handled by in-house technicians, the installation and major overhauls of equipment are outsourced. The predominant refrigerants in the industrial sector are ammonia and R-404A, representing approximately 40 per cent and 50 per cent, respectively, of the volume of refrigerants used in this sector. HFC-134a is used to a lesser extent in smaller equipment, constituting approximately 10 per cent of the refrigerants used in this sector.

22. In the case of process chillers, the cooling capacity ranges from 80 to 750 kW. Refrigerants such as R-410A and R-404A dominate the sector. Ammonia and HFC-134a are also used in smaller quantities.

23. The industrial refrigeration sector is the dominant contributor to refrigerant use and emissions due to the extensive use of R-404A. This is primarily due to high leakage rates in this equipment, which can be as high as 35 per cent. Additionally, large equipment is being charged with refrigerants during installation, and this consumption is included in the total consumption. About 66.78 mt of HFCs are used in this application.

Transport refrigeration

24. Transport refrigerated vehicles are typically imported either fully equipped with an insulated box and refrigeration equipment or, more commonly, without them. In the latter scenario, manufacturers install

the refrigeration equipment locally. Local refrigerated vehicles, including multi-compartment vehicles, are designed for distributing frozen, chilled, and dry products. The majority of medium to large vehicles utilize an auxiliary diesel engine to power the refrigeration unit, with cooling capacities ranging from 2.5 to 10 kW, depending on the application. R-404A is commonly used as a refrigerant in these applications, with 1.88 mt being used.

Residential and commercial air-conditioning servicing

Single split air conditioners (residential)

25. Single split air conditioners are very popular due to their capacity to operate in different space cooling applications; it is estimated that about 63 per cent of the total market for split air conditioners are in the 10,000 to 13,000 BTU/hr capacity range.

26. Import and sale of HCFC-22-based air conditioners have been banned in the country; R-410A is the dominant refrigerant used in this sector. More recently HFC-32-based air conditioners have entered the market, but they are still not the majority. About 24.61 mt of HFCs are used in this application.

Commercial air-conditioning

27. Multi-splits and air conditioners based on the Variable Refrigerant Volume (VRV)/Variable Refrigerant Flow (VRF) systems are typically used for cooling in commercial and industrial applications, and their use has experienced an increase, though rooftop type air conditioners are not widespread. About 30.08 mt of HFCs are used in this application, with R-410A being the most commonly used refrigerant.

Mobile air-conditioning servicing

28. Nearly all cars, whether new or reconditioned, are equipped with air conditioners. A limited number of mobile air-conditioning (MAC) units are imported for repairs. Mauritius imports annually approximately 20,000 vehicles, the majority of which are based on HFC-134a and only a limited quantity is installed with HFO-1234yf. About 14.71 mt of HFC-134a is used annually for servicing these MAC units.

IV. Stage I of the Kigali HFC implementation plan as submitted

Institutional, policy and regulatory framework

Regulatory controls

29. The Dangerous Chemicals Control Act 2004 (DCCA) (MoHW, 2004) provides for a regulatory framework to protect workers, the public and the environment against potential damage caused by the use of dangerous chemicals, and has been used in the past to control the import and export of ODS. The First Schedule of the DCCA provides a list of dangerous chemicals for which a licence is required for importation, exportation, manufacture, sale, storage, distribution or trade (e.g., HCFCs). Importation of goods is controlled under the Consumer Protection (Control of Imports) Regulations 2017, under the aegis of the Ministry of Commerce and Consumer Protection and this includes controls on CFCs and HCFCs. Mauritius implemented a ban on importation of appliances containing HCFCs since 1 January 2013 through the Consumer Protection (Control of Imports) Regulations 2013. Further, customs duties and taxes on imported goods are levied under the Customs Tariff Act of 1970.

30. This Act is also used for controlling HFCs. The import quotas for HFCs would be provided through the DCCA.

Institutional framework

31. The national ozone unit (NOU) within the Ministry of Environment, Solid Waste Management and Climate Change, handles the processing of clearances, before channeling to external institutions, namely to the Mauritius Revenue Authority (customs) and the Dangerous Chemical Control Board (DCCB). The NOU is responsible for implementing Montreal Protocol projects and activities, monitoring and reporting data on controlled substances to ensure that the consumption limits for those substances are achieved, as well as participating in consultative meetings including international meetings.

32. The Customs Department of the Mauritius Revenue Authority ensures compliance to customs laws. There is no specialized unit or section at the Customs Department for monitoring and controlling trade in RAC equipment and refrigerants. A memorandum of understanding was signed in 2013 between the NOU (of the then Ministry of Environment, Sustainable Development and Disaster, and Beach Management) and the Customs Department, to ensure that customs officers are regularly trained on provisions of the Montreal Protocol and are fully equipped to enforce the legislations effectively in order to track any illegal trade of controlled substances.

33. The Energy Efficiency Management Office, established under the Energy Efficiency Act 2011, is responsible for enforcing energy efficiency standards on RAC equipment and is currently finalizing regulations for the implementation of minimum energy performance standards for air-conditioning equipment having a rated capacity below 12kW. The additional activities to maintain energy efficiency for the servicing sector under decision 89/6 approved at the 93rd meeting³ would provide additional support for effective development and implementation of these standards.

34. The Steering Committee was established to track progress in the implementation of activities and make policy decisions in connection with the Montreal Protocol. It is chaired by the Permanent Secretary of the Ministry of Environment, Solid Waste Management and Climate Change. Members of the committee include officers of the NOU, representatives from the Ministry of Finance, the Customs Department, the DCCB, the Ministry of Commerce and Consumer Protection, the Ministry of Education, the Ministry of Energy and Public Utilities, the Ministry of Local Government, Solid Waste Management Division, Université des Mascareignes and Mauritius Institute of Training and Development (MITD). Importers of RAC equipment and refrigerants are also co-opted as and when required. This committee is central to the country's decision-making on the provisions of the Protocol, and activities to be prioritized and implemented to meet its international obligations.

35. Two institutions, Université des Mascareignes and the University of Mauritius, offer courses at both undergraduate and postgraduate levels and include modules on RAC. The Mauritius Qualifications Authority, operating under the Ministry of Education and Human Resources, Tertiary Education and Scientific Research, is responsible for accrediting institutions. In the engineering, manufacturing, and construction fields, only the MITD, a public training institution, offers courses in the RAC sector at different levels. The Vocational and Training Institute is the only private institution to provide courses in RAC applications.

Phase-down strategy for stage I of the Kigali HFC implementation plan

Overarching strategy

36. The primary focus of the strategy is to achieve the freeze and the 10 per cent reduction step by 2029, considering provisions of decision XXXV/16 of the Meeting of the Parties⁴ as relevant. The strategy

³ UNEP/OzL.Pro/ExCom/93/69

⁴ To address the impacts of the COVID-19 pandemic on HFC baseline consumption for certain Article 5 countries including Mauritius, the Meeting of the Parties *inter alia* decided that the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol should defer, until 2026 data becomes available, any

will focus on reducing demand for HFCs taking into consideration growth in the cooling industry; establishing an enabling environment through regulatory provisions that provides impetus to adopt low-GWP technologies in different cooling applications; providing skills and know-how to the industry on refrigerant containment, and on prevention/minimizing of leaks and safe handling of low-GWP alternatives including retrofits where feasible; creating awareness on HFC reduction and technology options; and leveraging benefits from integrating KIP initiatives with the ongoing HPMP activities.

37. Key regulatory initiatives to achieve this would include regulations to control imports of HFC-based RAC technologies (e.g., HFC-134a and R-404A) for which there are already low-GWP alternatives available in the global and local markets; demonstration of low-GWP alternatives especially for condensing units; support training centres with R-290 monoblock⁵ technology to create awareness and promote adoption of this technology wherever feasible and related training to technicians; and capacity building on containment practices especially for commercial refrigeration and air conditioners to prevent leakages.

38. Stage I of the KIP will specifically target applications like domestic refrigerators, stand-alone commercial refrigeration units, R-404A-based commercial and industrial refrigeration equipment, domestic air conditioners, while working in synergy with the HPMP.

Proposed reductions

39. Based on inputs received from the industry during the KIP survey and from stakeholder consultations during the preparation of the KIP submission, the HFC consumption for 2024 to 2029 is estimated to grow at 4 per cent per annum. At this growth rate, the HFC consumption in 2029 would exceed the Montreal Protocol targets in the absence of any intervention. Stage I of the KIP is proposed to be implemented to control the growth of HFC consumption to achieve 2029 Montreal Protocol control limits; this will result in a reduction of HFC consumption of 66,596 CO₂-eq tonnes from the freeze levels. Table 7 presents the Montreal Protocol limits, consumption forecast and the proposed HFC consumption reductions for the years 2024 to 2029.

Table 7. HFC consumption forecast under unconstrained scenario, Montreal Protocol limits and proposed HFC reductions under stage I (CO₂-eq tonnes)

	2023*	2024	2025	2026	2027	2028	2029
HFC consumption forecast (annual growth rate of 4 per cent**)	530,740	551,970	574,048	597,010	620,891	645,726	671,555
Montreal Protocol HFC consumption limits	n/a	665,957	665,957	665,957	665,957	665,957	599,361
Proposed HFC consumption under the KIP	n/a	665,957	665,957	665,957	665,957	665,957	599,361
Proposed reduction in HFC consumption from baseline (%)	n/a	0	0	0	0	0	10

* As per Article 7 data

** Growth calculated based on inputs from the survey.

consideration of compliance status with regard to control measures for consumption of Annex F substances on the understanding that the countries will continue to make every effort to comply with these control measures.

⁵ Refrigeration equipment pre-charged with refrigerant and containing all components required for cooling (i.e., compressor, condenser, evaporator, expansion valves and fans) in a single unit.

Proposed activities

40. The different elements of the KIP for Mauritius with their cost breakdown are presented below:

- (a) *Establishing and implementing a regulatory framework:* Develop and adopt policy and fiscal measures to reduce dependence on HFCs in the RAC sector; support the Standards Bureau in drafting more strict standards for spare parts to enhance the quality of servicing and optimize the performance of equipment with minimum leakages; support customs with the adoption of Harmonized Systems (HS) codes for HFC blends; enforcement of HFC controls through the training of 100 customs officers on regulations for monitoring and reporting of HFCs (US \$80,000);
- (b) *Support to the RAC industry:* Provide MITD with a training unit and tools for CO₂-based refrigeration equipment; purchase of a R-290-based monoblock to be installed at MITD for the purposes of introducing this technology to the industry and providing training on installation and servicing of such equipment; provide equipment for MAC training, including a MAC recovery and recycling unit and relevant tools (i.e., leak detector, gauges); support to training institutes to update the curriculum on CO₂ technology, as well as the MAC training curriculum on recovery and reuse of refrigerants; provide tools and equipment for MAC training relating to leak testing and leak proofing of MAC systems; training of 50-80 commercial refrigeration and 20-50 MAC technicians with a focus on leak prevention, recovery of refrigerants and monoblocks; provide tools and equipment to technicians to work with low-GWP technologies (i.e., gauges, leak detectors, recovery units, recovery cylinders) (US \$170,000); and
- (c) *Awareness:* Awareness creation on, and implementation of HFC quotas for the fishing industry; stakeholders' engagement on implementation of quotas especially addressing the needs of the fisheries sector; awareness creation for commercial refrigeration users on the adoption of emerging technologies including monoblocks as well as leak prevention initiatives (US \$25,000).

Project implementation, coordination and monitoring

41. With the support of the Government of Germany, the NOU is responsible for coordinating and implementing all activities planned under the KIP; monitoring implementation progress; fulfilling the reporting requirements; and ensuring collaboration between all relevant stakeholders during project implementation. The project management unit (PMU) budget amounts to US \$50,000 which includes staff and consultants (US \$30,000), travel (US \$6,000) and meeting and other activities (US \$14,000).

Gender policy implementation

42. In line with decisions 84/92(d) and 90/48(c), the Government of Mauritius and the Government of Germany are committed to implementing the Multilateral Fund's operational policy on gender mainstreaming along with their own gender policies during the implementation of all KIP activities.

43. In Mauritius, the limited number of women working in the RAC sector can be explained by the fact that the sector has not been promoted among women as a professional opportunity. During stage I of the KIP, efforts will be made, through discussions with the training institute, to devise ways to encourage women's participation in the sector, particularly in trainings and workshops. With these efforts and ongoing monitoring of their impact, it is expected that women's participation in the RAC sector will increase over time.

Coordination of activities in the servicing sector under HCFC phase-out and HFC phase-down plans

44. The ongoing HPMP aims to successfully address the existing HCFC use and achieve the necessary HCFC phase-out by 2030. The KIP aims to ensure that this phase-out does not lead to an increase in the use of HFCs which can prevent Mauritius to meet its reduction targets under the KIP. For this reason, the KIP will aim to work in tandem with the ongoing HPMP activities ensuring that they complement their efforts mainly in training of service technicians and outreach activities that would promote low-GWP alternatives to HCFCs. Activities under both the KIP and the HPMP will be closely monitored to maximize complementarity to reduce HFC demand.

Total cost of stage I of the Kigali HFC implementation plan

45. The budget for stage I has been proposed at US \$325,000. The proposed activities and cost of stage I of the KIP are summarized in table 8.

Table 8. Proposed cost of activities to be implemented in stage I of the KIP for Mauritius (US \$)

Particular	Cost (US \$)
Establishing and implementing a regulatory framework	80,000
Support to the RAC industry	170,000
Awareness	25,000
Project coordination and monitoring	50,000
Total	325,000

Implementation of the first tranche of stage I of the Kigali HFC implementation plan

46. The first funding tranche of stage I of the KIP, in the total amount of US \$169,000, will be implemented between January 2025 and December 2027 and will include the following activities:

- (a) *Establishing and implementing the regulatory framework:* Develop and adopt fiscal measures by providing assistance to the NOU in drafting the HFC quota system and engaging with the Ministry of Finance on fiscal measures for promoting alternatives to HFCs; hire a consultant to support the Standards Bureau in drafting more strict standards for spare parts, and conduct a workshop for importers and other industry stakeholders on standards; support customs on developing draft HS codes; conduct at least three customs training workshops on regulations to monitor and report on HFCs (US \$39,000);
- (b) *Support to the RAC industry:* Procure and deliver a training unit and tools for CO₂-based refrigeration equipment; hire consultant to update the curriculum on CO₂; conduct training of 50 technicians on leak proofing systems and working on monoblocks; deliver tools and equipment for MAC training and conduct at least one training on leak testing and leak proofing of MAC systems; tender and distribute tools for technicians (US \$90,000);
- (c) *Awareness:* Awareness creation on HFC quotas through adverts and publicity and through at least one workshop on quotas targeting stakeholders in the fishing industry; conduct one workshop for stakeholder engagement on the adoption of R-290-based monoblock systems (US \$15,000); and
- (d) Project coordination and monitoring (US \$25,000) which includes staff and consultants (US \$15,000), travel (US \$3,000) and meeting and other activities (US \$7,000).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

V. Comments

Institutional, policy and regulatory framework

HFC licensing and quota system

47. In line with decision 87/50(g), the Government of Germany reported that the Government of Mauritius plans to establish a quota system for monitoring HFC imports/exports in 2025. Currently, the NOU controls the HFC import licenses issued to importers (in metric tonnes) and monitors the CO₂-eq tonnes value of those imports through its internal processes, thus controlling the total quantities of HFCs consumed in the country. Once the quota system is operational in 2025, the Government of Mauritius will issue the HFC quotas in line with the quota system. Furthermore, the training programme for technicians would cover key elements of the HFC quota system and how monitoring of HFC quotas would be undertaken. It was agreed that the Government of Germany would provide an update on the status of implementation of the HFC quota system as part of its 2024 financial and progress report to be considered at the 97th meeting.

Control of imports of HFC-based equipment

48. The Government of Mauritius aims to implement a ban on the import and use of HFC-based domestic refrigerators and small commercial refrigeration equipment from 1 January 2027. Further, the Government is considering implementing policies to reduce growth of other high-GWP HFCs such as R-410A, though no specific timelines are available. The Government of Germany also explained that additional details of specific policy interventions, including prohibitions, along with specific timelines would be available after the national elections to be held in 2025. The Government of Germany agreed that those details would be included, to the extent feasible and agreed, when the second tranche for stage I of the KIP was submitted.

49. The Secretariat had detailed discussions with the Government of Germany on the expected growth in HFC consumption in Mauritius in the next two to three years and how the Government of Mauritius plans to control this growth to achieve the targets outlined in annex I to the present document. As mentioned above, the country experienced a reduction in its HFC consumption in the baseline years due to the reduction in economic activities on account of the COVID-19 pandemic. At the 35th Meeting of the Parties to the Montreal Protocol, the Parties addressed the impact of the COVID-19 pandemic on the HFC baseline of countries that (a) have experienced demonstrated reductions in their respective levels of consumption of HFCs during the years 2020-2022, as compared to 2018-2019; (b) are expected to have calculated levels of consumption of HFCs in 2024 that exceed their respective calculated baselines; and (c) have expressed concern in writing to the Ozone Secretariat regarding the impact of the COVID-19 pandemic on their baselines. Accordingly, as mentioned above, decision XXXV/16 established *inter alia* that the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol should defer, until 2026 data becomes available, any consideration of compliance status with regard to control measures for consumption of HFCs for eight countries, including Mauritius, on the understanding that the countries will continue to make every effort to comply with these control measures.

50. As one of the Parties listed in decision XXXV/16 of the Meeting of the Parties, Mauritius is sensitive towards ensuring it remains compliant with its HFC phase-down commitments. The Government would implement relevant regulatory measures and conduct activities to minimize its HFC consumption growth. Further, the Government is also planning to submit a pilot project on energy efficiency in line with decision 91/65 at the 96th meeting to further facilitate the adoption of energy-efficient low-GWP refrigerant-based appliances, which would result not only in improving energy efficiency performance of equipment but also in reducing the country's HFC consumption.

51. The Secretariat notes that the Government of Mauritius intends to make every effort to comply with the Montreal Protocol control measures and that it has proposed in its KIP that its annual HFC consumption levels do not surpass the Montreal Protocol targets.

52. In light of decision XXXV/16, the Secretariat would seek guidance from the Executive Committee on the procedure to be followed if the HFC consumption level for the years 2024 or 2025 was above the Montreal Protocol control limits.

Technical and cost-related issues

Certification of service technicians

53. As explained above, there is no mandate under the current regulatory framework requiring the licensing and certification of RAC technicians prior to servicing RAC equipment. Industry stakeholders and the NOU have requested to address this gap, as the licensing system will reinforce the certification process and ensure that technicians continuously acquire relevant competencies adapted to ever-evolving technologies. Upon request from the Secretariat, the Government of Germany clarified that the licensing system will be initiated under the HPMP with available funds.

Agreed costs

54. The Secretariat noted that the proposed budget for stage I as submitted exceeded the maximum funding allowed under the guidelines of decision 92/37. After further discussions with the Government of Mauritius, the Government of Germany agreed to revise the budget to US \$190,000 in line with the decision. This was achieved by reducing the number of customs officers to be trained from 100 to 40, removing the support to MIDT for the procurement of CO₂-based equipment for training, revising the total number of technicians to be trained from a minimum of 70 to 115, adding the training of 22 technician trainers and reducing the PMU budget from US \$50,000 to US \$19,000. In light of the above, table 9 presents the revised budget for stage I of the KIP.

Table 9. Agreed costs of activities to be implemented during stage I of the KIP in Mauritius (US \$)

Particulars	Original costs (US \$)	Revised costs US \$
Establishing and implementing regulatory framework	80,000	30,000
Support to the RAC industry	170,000	116,000
Awareness	25,000	25,000
Project coordination and monitoring	50,000	19,000
Total	325,000	190,000

Project management unit

55. Funding for the PMU was revised to US \$19,000 (US \$11,400 for staff and consultants, US \$2,280 for travel, and US \$5,320 for meetings and other expenses) calculated at 10 per cent of the project costs.

Total project cost

56. At the total cost of US \$190,000, stage I of the KIP for Mauritius will result in a reduction of 66,596 CO₂-eq tonnes from the country's HFC consumption eligible for funding.

57. Stage I of the KIP will be implemented in two tranches. The schedule of HFC phase-down and HCFC phase-out commitments of the KIP and HPMP tranches, and the activities of stage II of the HPMP and stage I of the KIP are presented in annex I and annex II, respectively, to the present document.

Implementation plan for the first tranche of the Kigali HFC implementation plan

58. Based on the revised funding for stage I of the KIP, the first funding tranche of stage I has been revised to US \$103,000 and would include the following:

- (a) Support for implementing the regulatory framework including conducting at least one training workshops for 20 customs officers on regulations to control and monitor HFCs (US \$15,000);
- (b) Support to the RAC industry including conducting training of 50 technicians on leak proofing systems and working on monoblocks; deliver tools and equipment for MAC training and conduct at least one training on leak testing and leak proofing of MAC systems; distribution of tools for technicians (US \$63,000);
- (c) Awareness and information outreach on low-GWP refrigeration technologies and implementation of HFC quotas specifically targeting inputs to the fisheries sector (US \$15,000); and
- (d) Project coordination and monitoring (US \$10,000).

Co-financing

59. The Government of Mauritius would provide in-kind contribution in the form of equipment support to service technicians, with about 25 to 30 per cent of total equipment cost expected to be shared by the enterprise. In addition, the training institutes would make available laboratory and staff support at very subsidized rates or free of charge during training activities.

2024-2026 business plan of the Multilateral Fund

60. The Government of Germany is requesting US \$190,000, plus agency support costs, for the implementation of stage I of the KIP for Mauritius. The total value of US \$116,390, including agency support costs, requested for the period of 2024–2026, was not included in the business plan.

Sustainability of the HFC phase-down and assessment of risks

61. The Government of Mauritius would implement a strong HFC licensing and quota system to ensure that the supply of HFCs is controlled in line with the country's targets under stage I of the KIP and that growth is curtailed to the extent feasible. Furthermore, the Government would implement capacity-building and training activities for service technicians in the refrigeration sector and air-conditioning sector, in an integrated manner with the HPMP activities and this would facilitate the adoption of low-GWP alternatives in various applications. The country would also implement policies and regulations prohibiting the import and sale of HFC-based domestic refrigeration and small commercial refrigeration equipment by 1 January 2027. For other commercial refrigeration and air-conditioning applications, the Government would continue to consult the industry on implementing prohibitions on the import and sale of HFC-based equipment. Awareness and outreach activities related to alternative technologies in air conditioning would be undertaken to avoid, to the extent feasible, the adoption of high-GWP refrigerant-based air-conditioning equipment. These interventions would result in a continued decrease in HFC consumption and the achievement of targets under stage I of the KIP.

Impact on the climate

62. The activities proposed, including efforts to promote low-GWP alternatives and adoption of good service practices including refrigerant recovery and reuse, indicate that the implementation of stage I of the KIP will reduce refrigerant emissions into the atmosphere, resulting in climate benefits. While the Secretariat is not able to provide an estimate of the avoided emissions from the implementation of the KIP at the present meeting, by 2029 Mauritius will have reduced its annual HFC emissions by approximately 66,596 CO₂-eq tonnes, calculated as the difference between the HFC baseline for compliance and the 2029 target, assuming that all consumed HFCs would eventually have been emitted.

Draft Agreement

63. A draft Agreement between the Government of Mauritius and the Executive Committee for stage I of the KIP has not been prepared as the Agreement template is still under consideration by the Executive Committee.

64. If the Executive Committee so wishes, the funds for stage I of the KIP for Mauritius could be approved in principle, and funds for the first tranche could be approved on the understanding that the Agreement would be prepared and presented at a future meeting, before the submission of the second tranche, and once the Agreement template has been approved.

VI. Recommendation

65. The Executive Committee may wish to consider:

- (a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for Mauritius for the period 2024-2029 to reduce HFC consumption by 10 per cent of the country's baseline by 2029, in the amount of US \$190,000, plus agency support costs of US \$24,700, for the Government of Germany, as reflected in the schedule contained in annex I to the present document;
- (b) Noting:
 - (i) That, if the HFC consumption level for Mauritius for the years 2024 or 2025 was above the Montreal Protocol control limits or the maximum allowable consumption in the future Agreement between the Government of Mauritius and the Executive Committee, on the understanding that the Government of Mauritius would continue to make every effort to meet those control limits, the Secretariat would inform and seek guidance from the Executive Committee on the procedure to follow in light of decision XXXV/16;
 - (ii) That the Government of Germany would provide, as part of its 2024 financial and progress report to be considered at the 97th meeting, an update on the status of implementation of the HFC quota system in Mauritius; and
 - (iii) That the Government of Mauritius aims to implement a ban on the import and use of HFC-based domestic refrigerators and small commercial refrigeration equipment from 1 January 2027;
- (c) Approving the first tranche of stage I of the KIP for Mauritius, and the corresponding tranche implementation plan, in the amount of US \$103,000, plus agency support costs of US \$13,390, for the Government of Germany; and

- (d) Requesting the Government of Mauritius, the Government of Germany and the Secretariat to finalize the draft Agreement between the Government of Mauritius and the Executive Committee for the reduction in consumption of HFCs, including the information contained in the annex referred to in subparagraph (a) above, and to submit it to a future meeting once the KIP Agreement template had been approved by the Executive Committee.

Annex I

**SCHEDULE OF HFC PHASE-DOWN AND HCFC PHASE-OUT COMMITMENTS AND FUNDING TRANCHES
UNDER THE KIGALI HFC IMPLEMENTATION PLAN AND THE HCFC PHASE-OUT MANAGEMENT PLAN FOR MAURITIUS**

Kigali HFC implementation plan (stage I)

Row	Particulars	2024	2025	2026	2027	2028	2029	Total
1.1	Montreal Protocol reduction schedule of Annex F substances (CO ₂ -eq tonnes)	665,957	665,957	665,957	665,957	665,957	599,361	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO ₂ -eq tonnes)	665,957	665,957	665,957	665,957	665,957	599,361	n/a
2.1	Lead IA (Germany) agreed funding (US \$)	103,000	0	0	87,000	0	0	190,000
2.2	Support costs for Lead IA (US \$)	13,390	0	0	11,310	0	0	24,700
3.1	Total agreed funding (US \$)	103,000	0	0	87,000	0	0	190,000
3.2	Total support costs (US \$)	13,390	0	0	11,310	0	0	24,700
3.3	Total agreed costs (US \$)	116,390	0	0	98,310	0	0	214,700

HCFC phase-out management plan (stage I)

Row	Particulars	2011	2013	2014	2015	2017	2020	2023		2025	2030	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)		8.00	8.00	7.20	7.20	5.20	5.20		2.80	0.20	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)		8.00	8.00	7.14	7.14	4.00	1.57		0.16	0	n/a
2.1	Lead IA (Germany) agreed funding (US \$)	157,050	0	131,400	0	332,750	161,300	67,500	120,000	0	100,000	1,070,000
2.2	Support costs for Lead IA (US \$)	18,846	0	15,851	0	40,140	19,458	7,843	13,943	0	11,619	127,700
3.1	Total agreed funding (US \$)	157,050	0	131,400	0	332,750	161,300	67,500	120,000	0	100,000	1,070,000
3.2	Total support cost (US \$)	18,846	0	15,851	0	40,140	19,458	7,843	13,943	0	11,619	127,700
3.3	Total agreed costs (US \$)	175,896	0	147,251	0	372,890	180,758	75,343	133,943	0	111,619	1,197,700

Annex II

**SIMULTANEOUS IMPLEMENTATION OF THE HCFC PHASE-OUT MANAGEMENT PLAN
AND THE KIGALI HFC IMPLEMENTATION PLAN IN MAURITIUS**

Category of activity	HPMP – stage I		KIP – stage I		HPMP+KIP combined cost (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
Regulatory controls	Training workshops for customs (12)	155,000	Develop and adopt fiscal measurers	30,000	90,000
	Identifiers (6)		Support Standards Bureau		
	Developing MEPS including data collection		Support customs including trainings (40 officers)		
	Training on MEPS to local authority				
	Establishment of a monitoring, reporting and verification system				
	Developing guidelines for green procurement				
Support for RAC industry	Training of trainers	740,000	Training of trainers	116,000	856,000
	Training of technicians (20)		Training of technicians (115)		
	Incentive scheme for R-290		Provide a R-290 monoblock for training		
	Carbon dioxide supermarket demo		Support to develop curriculum on carbon dioxide		
	Recovery units (20) cylinders (50)		Tools and equipment for MAC training		
			Tools for technicians		
Awareness	Workshops (5)	50,000	Awareness creation on HFC quotas	25,000	50,000
	Support for media adverts		Stakeholder engagement		
	Workshops for MEPS finalisation				
Coordination and monitoring	Establish and support PMU	125,000	Project monitoring and reporting	19,000	144,000
Total		1,070,000		190,000	1,260,000
Percentage of total (%)		84.9		15.1	100