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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 PROPOSALS: COLOMBIA

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

Phase-down

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

Energy efficiency

- | | | |
|---|------|-----------------------------|
| • Pilot project to maintain and/or enhance the energy efficiency of replacement technologies and equipment in the context of HFC phase-down (non-investment activities) | UNDP | Individual
consideration |
|---|------|-----------------------------|

¹ UNEP/OzL.Pro/ExCom/95/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Colombia

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

LATEST ARTICLE 7 DATA (Annex F)	Year: 2023	2,933.99 mt	6,206,292 CO ₂ -eq tonnes
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SECTORAL HFC CONSUMPTION DATA (CO ₂ -eq tonnes) AND ACTIVITIES									
	Aerosol	Foam	Fire-fighting	AC and refrigeration				Solvent	Other
				Manufacturing			Servicing		
				Refrigeration	AC	Total*			
As submitted (2023)	139,253	198,007	9,450			868,810	4,538,040		455,179**
Latest CP report (2023)		204,985	9,450			868,770	4,542,881		594,389***
KIP stage I activities as agreed (Y/N)	N	N	N			Y	Y		Y****

* Breakdown of manufacturing consumption is not available

** Includes process agents (glass) (5,625 CO₂-eq tonnes) and RAC installation and assembly (449,554 CO₂-eq tonnes)

*** Includes process agents (glass), RAC installation and assembly, and aerosols (metered-dose inhalers)

**** Stage I includes activities in the RAC installation and assembly sector

AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING	2,399.16 mt	5,197,564 CO ₂ -eq tonnes
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BASELINE CONSUMPTION DATA (CO ₂ -eq tonnes)	2020	2021	2022	Average 2020-2022
HFC annual consumption	5,064,307	5,086,999	9,242,759	6,464,688
HCFC baseline (65%)				2,188,294
HFC baseline				8,652,982

HFC CONSUMPTION ELIGIBLE FOR FUNDING	
Starting point for sustained aggregate reductions	TBD
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		8,652,982	8,652,982	8,652,982	8,652,982	8,652,982	7,787,684	n/a
	Maximum allowable		8,652,982	8,652,982	8,652,982	8,652,982	8,652,982	7,068,258	n/a
	Maximum allowable (%)		100	100	100	100	100	81.7	n/a
Amounts recommended in principle (US \$)	UNDP	Project costs	2,554,986	0	0	1,715,974	0	0	4,270,960
		Support costs	178,849	0	0	120,118	0	0	298,967
	Germany	Project costs	258,825	0	0	109,900	0	0	368,725
		Support costs	33,647	0	0	14,287	0	0	47,934
	UNEP	Project costs	0	0	0	50,000	0	0	50,000
		Support costs	0	0	0	6,500	0	0	6,500
	Total project costs		2,813,811	0	0	1,875,874	0	0	4,689,685
	Total support costs		212,496	0	0	140,905	0	0	353,401
	Total funds		3,026,307	0	0	2,016,779	0	0	5,043,086

* Recommended for approval at the present meeting

Reduction from remaining consumption eligible for funding stage I in CO ₂ -eq tonnes	1,584,724
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Secretariat's recommendation:	Individual consideration
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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 Colombia, UNDP as the lead implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), at a total cost of US \$5,625,588, consisting of US \$4,738,550, plus agency support costs of US \$331,699 for UNDP, US \$441,450, plus agency support costs of US \$57,389 for the Government of Germany, and US \$50,000, plus agency support costs of US \$6,500 for UNEP, as originally submitted.²

3. The implementation of stage I of the KIP will assist the Government of Colombia in meeting the target of 15 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 \$3,365,852, consisting of US \$2,813,130, plus agency support costs of US \$196,919 for UNDP, US \$264,870, plus agency support costs of US \$34,433 for the Government of Germany, and US \$50,000, plus agency support costs of US \$6,500 for UNEP, 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 HPMP in Colombia as of November 2024.

Table 1. HPMP implementation status for Colombia

	Stage I	Stage II	Stage III
Meetings when HPMP was approved/updated	62 nd /66 th	75 th	88 th
Reduction from baseline	10% by 2015	65% by 2021	100% by 2030
Total project cost (US \$)	6,821,483	4,678,519	2,078,635
Date of completion (actual/planned)	31 December 2016	31 December 2022	31 December 2031

² As per the letter of 24 July 2024 from the Ministry of Environment and Sustainable Development of Colombia to UNDP.

Status of implementation of previous HFC-related activities

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

Table 2. Previously approved HFC-related activities in Colombia

Approval meeting	Project title	Implementing agency	Cost (US \$)	Date of completion
75 th	Survey of ODS alternatives	Germany	65,000	Mar 2017
80 th	Enabling activities for HFC phase-down	UNDP	250,000	Jun 2021

III. HFC consumption overviewHFC consumption levels

7. Colombia imports HFCs for use in the RAC servicing, RAC manufacturing, polyurethane (PU) foam manufacturing, firefighting, aerosol, and solvent sectors. The most consumed substances in 2023 were HFC-134a (30.0 per cent of total HFC consumption in CO₂-eq tonnes), R-507A (29.7 per cent), R-410A (21.7 per cent), R-404A (12.6 per cent), and other HFCs (6.1 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 Colombia (2019–2023 Article 7 data)

HFC	GWP	2019	2020	2021	2022	2023
Metric tonnes (mt)						
HFC-125	3,500	2.62	2.65	4.47	1.50	1.32
HFC-134a	1,430	1,483.29	1,265.41	1,249.47	1,797.59	1,302.00
HFC-152a	124	24.00	17.31	21.70	24.30	45.36
HFC-227ea	3,220	2.52	1.00	2.00	7.50	1.50
R-404A	3,922	188.30	138.45	135.81	412.81	199.57
R-407C	1,774	13.91	96.52	69.37	73.48	35.48
R-410A	2,088	594.88	455.37	393.42	880.38	645.06
R-417A	2,346	-	-	25.87	14.80	22.03
R-422D	2,729	7.00	23.54	32.28	45.17	14.70
R-437A	1,805	22.00	39.10	21.73	12.10	0.93
R-507A	3,985	259.30	350.31	360.33	661.11	463.16
CustMix-134	964	22.08	19.2	173.72	229.92	205.44
Others*		7.78	13.77	1.98	7.82	-0.23
Total (mt)		2,627.68	2,422.63	2,492.15	4,168.48	2,936.32
CO₂-eq tonnes						
HFC-125	3,500	9,170	9,265	15,645	5,250	4,620
HFC-134a	1,430	2,121,105	1,809,529	1,786,742	2,570,554	1,861,860
HFC-152a	124	2,976	2,146	2,691	3,013	5,625
HFC-227ea	3,220	8,114	3,220	6,440	24,150	4,830
R-404A	3,922	738,437	542,938	532,592	1,618,876	782,634
R-407C	1,774	24,674	171,216	123,052	130,342	62,936
R-410A	2,088	1,241,812	950,581	821,264	1,837,793	1,346,563
R-417A	2,346	-	-	60,691	34,721	51,682
R-422D	2,729	19,103	64,248	88,091	123,267	40,116
R-437A	1,805	39,711	70,572	39,224	21,841	1,679
R-507A	3,985	1,033,311	1,395,981	1,435,915	2,634,523	1,845,693
CustMix-134	964	21,281	18,505	167,435	221,601	198,007
Others*		10,657	26,107	7,217	16,829	47
Total (CO₂-eq tonnes)		5,270,350	5,064,307	5,086,999	9,242,759	6,206,292

* Including HFC-32, HFC-236fa, R-407F, R-413A, R-422A, R-438A, R-448A, R-449A, R-452A, R-454C, R-508B, R-513A, CustMix-262, CustMix-269, CustMix-315

Established HFC baseline

8. The Government of Colombia reported the Article 7 data for 2020-2022. The country's HFC consumption baseline was established at 8,652,982 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 Colombia (CO₂-eq tonnes)

Baseline calculation components	2020	2021	2022
HFC annual consumption	5,064,307	5,086,999	9,242,759
HFC average consumption in 2020-2022	6,464,688		
HCFC baseline (65%)	2,188,294		
HFC baseline	8,652,982		

Country programme implementation report

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

10. The country updated its 2022 CP data to reflect exports of a blend comprising 93 per cent HFC-365mfc and 7 per cent HFC-227ea contained as a pre-blended polyol rather than as a neat substance; the exported product is not included in the country's calculated HFC consumption under Article 7.

HFC consumption trends

11. There is an overall growth trend in HFC consumption in the country. In 2020 and 2021, consumption temporarily dropped due to effects of the COVID-19 pandemic, with the impacted global supply chain and drop in maintenance needs of RAC equipment. The growth in consumption in 2022, followed by the 2023 decrease, is further discussed in paragraph 59 of the present document.

12. While Colombia reported consumption of 28 HFCs and HFC blends, only four substances (HFC-134a, R-404A, R-410A and R-507A) account for 93 per cent of HFC consumption in CO₂-eq tonnes. R-507A has had the greatest impact on growth in CO₂-eq tonnes due to its increased import in recent years and high global warming potential (GWP).

HFC consumption by sector

13. Colombia consumes HFCs in the RAC servicing, RAC manufacturing, and installation and assembly sectors, as well as to manufacture PU foam, process agents and solvents, firefighting agents, and aerosols for commercial use and in metered-dose inhalers. Approximately 72 per cent of HFCs in the country are consumed to service RAC equipment and 23 per cent in manufacturing, with the remaining 5 per cent consumed in the installation and assembly of RAC equipment.

14. For servicing, HFCs are mainly consumed in the mobile air-conditioning (MAC) (23.8 per cent in mt and 16.1 per cent in CO₂-eq tonnes) and residential air-conditioning (AC) (16.4 per cent in mt and 16.2 per cent in CO₂-eq tonnes) subsectors, followed by other subsectors as shown in tables 5 and 6.

Table 5. HFC consumption in Colombia by sector in mt (2023)

Sector	HFC-134a	R-404A	R-410A	R-507A	HFC-365mfc/HFC-227ea*	Others**	Total	Share of total (%)
Manufacturing								
RAC	125.50	39.92	34.19	115.79	-	-	315.40	10.7
PU foam	-	-	-	-	205.44	-	205.44	7.0

Sector	HFC-134a	R-404A	R-410A	R-507A	HFC-365mfc/HFC-227ea*	Others**	Total	Share of total (%)
Aerosol	97.38	-	-	-	-	-	97.38	3.3
Firefighting	-	-	-	-	-	2.82	2.82	0.1
Glass processing	-	-	-	-	-	45.36	45.36	1.5
Subtotal for manufacturing	222.88	39.92	34.19	115.79	205.44	48.18	666.40	22.7
Refrigeration and AC servicing								
Refrigeration subsectors								
Domestic	205.68	-	-	-	-	0.50	206.18	7.0
Commercial	79.28	81.24	-	111.64	-	20.93	293.09	10.0
Industrial	55.71	44.83	1.96	172.68	-	5.59	280.77	9.6
Transport	18.09	10.71	2.86	0.96	-	-	32.62	1.1
Air-conditioning subsectors								
Residential	-	-	481.27	-	-	-	481.27	16.4
Mobile	700.15	-	-	-	-	-	700.15	23.8
Commercial	6.58	-	80.54	-	-	47.03	134.15	4.6
Subtotal for servicing	1,065.49	136.78	566.63	285.28	-	74.05	2,128.23	72.4
Installation and assembly RAC	14.95	21.95	44.51	62.53	-	-	143.94	4.9
Total	1,303.32	198.65	645.33	463.60	205.44	122.23	2,938.57	100

* HFC blend containing 93 per cent HFC-365mfc and 7 per cent HFC-227ea

** Includes HFC-125, HFC-225ea, HFC-152a, R-407C, R-417A, R422D, R-437A, R-449A, R-454C, R-508B, CustMix-269 (HFC-125=24%; HFC-236fa=40%; HFC-23=10%; PFC-14=20%; R-740=6%), CustMix-315 (HFC-125=14%; HFC-245fa=40%; HFC-23=20%; PFC-14=20%; R-740=6%)

Table 6. HFC consumption in Colombia by sector in CO₂-eq tonnes (2023)

Sector	HFC-134a	R-404A	R-410A	R-507A	HFC-365mfc/HFC-227ea	Others	Total	Share of total (%)
Manufacturing								
RAC	179,465	156,550	71,372	461,423	-	-	868,810	14.0
PU foam	-	-	-	-	198,007	-	198,007	3.2
Aerosol	139,253	-	-	-	-	-	139,253	2.2
Firefighting	-	-	-	-	-	9,450	9,450	0.2
Glass processing	-	-	-	-	-	5,625	5,625	0.1
Subtotal for manufacturing	318,718	156,550	71,372	461,423	198,007	15,075	1,221,145	19.7
Refrigeration and AC servicing								
Refrigeration subsectors								
Domestic	294,122	-	-	-	-	903	295,025	4.8
Commercial	113,370	318,591	-	444,885	-	47,607	924,453	14.9
Industrial	79,665	175,805	4,092	688,130	-	15,969	963,661	15.5
Transport	25,869	42,000	5,970	3,826	-	-	77,665	1.3
Air-conditioning subsectors								
Residential	-	-	1,004,651	-	-	-	1,004,651	16.2
Mobile	1,001,215	-	-	-	-	-	1,001,215	16.1
Commercial	9,409	-	168,127	-	-	93,834	271,371	4.4
Subtotal for servicing	1,523,651	536,396	1,182,840	1,136,841	-	158,312	4,538,040	73.1
Installation and assembly RAC	21,379	86,079	92,915	249,182	-	-	449,554	7.2
Total	1,863,748	779,026	1,347,126	1,847,446	198,007	173,387	6,208,740	100

*Manufacturing sectors**Refrigeration and air-conditioning manufacturing*

15. The country consumes HFCs for use in the manufacture of RAC equipment. An unspecified number of enterprises were identified in the manufacturing of stand-alone commercial refrigeration equipment, of which 27 will be converted under stage I. The manufacture and import of domestic refrigerators with HFC-134a were banned in 2022, at which time the domestic refrigeration manufacturing sector converted to isobutane (R-600a).

Polyurethane foam

16. An HFC blend containing 93 per cent HFC-365mfc and 7 per cent HFC-227ea is used by the PU systems houses as a blowing agent for the manufacture of fully formulated polyols that are used domestically in different applications by small enterprises that did not change their production processes to HFOs in the HPMP and in a smaller, but important proportion, exported to countries in the region. The substance that is imported unformulated to manufacture the polyol domestically is part of the country's consumption, however the same HFC blend as part of imported and exported fully formulated polyols is not counted as domestic consumption.

Solvents and process agents

17. Although the solvent sector in Colombia consumes HFCs, consumption varies and none was reported in 2023 for this use. An enterprise was identified as using HFC-152a as a process agent for glass production; since this is a low-GWP HFC-152a (124), replacing it for this application is not a priority. However, the country will continue to monitor its use and possible technology alternatives.

Firefighting

18. The most commonly used extinguishing agents in Colombia are water, physical foams, extinguishing powders, CO₂ and halogenated hydrocarbons, which have been replaced by alternative substances (HCFC-123, HCFC-141b, HFC-227ea and HFC-125) since the import of halons were prohibited in Colombia in 2010, noting that extinguishers with clean agents are not manufactured in Colombia and that the cylinders, valves and cleaning agents are imported and assembled for marketing. The country reports that 60 per cent of the imported HFCs entering the country as pure substances for the firefighting sector are used for new systems and 40 per cent for maintenance and recharge of systems already installed. In 2023, only HFC-125 and HFC-227ea were imported.

Aerosols

19. HFC applications as aerosols are mostly limited to propellants in the pharmaceutical industry, particularly pharmaceutical grade HFC-134a which is used to manufacture metered-dose inhalers, and mainly through an enterprise that covers national institutional and commercial distribution. While the production of inhalers has generally increased since 2020, the import of HFC-134a has varied over the past five years, noting a significant dip in 2021 with import numbers returning to pre-pandemic levels in 2023.

Refrigeration and air-conditioning servicing sector

20. In the servicing sector, it is estimated that there are between 12,000 and 20,000 technicians consuming HFCs in Colombia. The Government does not have accurate data for the number of female technicians or number of workshops in the country. The number of MAC servicing workshops has been estimated at 320.

21. Colombia has a voluntary, competency-based certification system in place. The National Accreditation Agency authorizes institutions to perform certification; the National Service for Apprenticeship (SENA) is currently the only organization with this role.

Domestic, commercial, industrial and transport refrigeration servicing

22. Since 2022, when the manufacture and import of domestic refrigerators with HFC-134a was banned, HFC-134a has only been imported to service existing HFC-134a-based refrigerators. The main substitute is R-600a, although refrigerators with R-437A have also been imported. Of the 16.6 million refrigerators installed in 2023, 50.7 per cent use R-600a, 49.2 per cent use R-134a, and the small remaining amount use R-437A. The demand for HFC-134a in domestic refrigeration is predicted to gradually reduce and be completely replaced by R-600a by approximately 2034.

23. In Colombia, the commercial refrigeration subsector is the most diverse in refrigerants and technology, reporting the use of eight different refrigerants, with R-507A, R-404A and R-134a being the most commonly used in stand-alone units, condensing units and ice machines. The current trend is towards rapid growth of R-507A and R-134a, while R-404A grows more slowly, although changes in these trends will depend on national policies and emerging low-GWP technologies. The highest consuming subsectors are commercial and industrial refrigeration units located in hotels, restaurants, supermarkets and department stores; logistics and cold chain sectors including refrigeration units installed in collection centres and refrigerated vehicles; IT services including cooling units located in data centres and enterprise server rooms; airports; and banks.

24. Industrial refrigeration includes activities in the agro-industrial production sector consisting of commercial and industrial refrigeration units located in poultry, cattle and swine processing plants; in fish farming, aquaculture and shrimp farming plants; in milk processing and dairy products production plants; in plants producing beer, spirits, non-alcoholic beverages such as carbonated beverages, juices and bottled water; and industrial refrigeration units located in flower plantations. Other industries include power generation and telecommunications enterprises, and industrial processes in petroleum and others. There are nine different refrigerants reported in the use of AC chillers, process chillers, and industrial condensing units with R-507A, R-134a and R-404A being the most commonly used.

25. HFC consumption in refrigerated transportation services consists of refrigerated trucks and trailers exclusively.

Residential and commercial air-conditioning servicing

26. Of the total R-410A refrigerant used in the domestic AC servicing sector, split residential AC units make up 86.4 per cent, followed by 8.7 per cent by self-contained AC units and 4.9 per cent by split duct residential AC units. In the commercial AC subsector, the consumption of five different refrigerants were reported, with R-410A being the most commonly used refrigerant across all the listed technologies, with multi-splits consuming the most (50.6 per cent), followed by commercial ducted splits (24.8 per cent), commercial splits (17.4 per cent), and rooftop ducted (7.2 per cent).

Mobile air-conditioning servicing

27. Car AC makes up 95.5 per cent of the total consumption in this subsector, with the remaining 4.5 per cent from large vehicle AC.

Local installation and assembly subsector

28. There are about 2,686 enterprises in the RAC assembly and installation subsector in the country; of those, about 81 enterprises focus on the assembly and installation of commercial and industrial

refrigeration systems and equipment. As part of the country's national strategy for the supermarket sector (comprising discount stores, small to large supermarkets, and hypermarkets), a survey had been carried out on the equipment and commercial refrigeration systems installed in supermarkets, revealing that condensing units and centralized and distributed refrigeration systems are the most common; seven enterprises were identified as covering the majority of the market share of assembling this type of supermarket equipment and will be supported under stage I in their phase-out of high-GWP HFCs. HFC consumption data prior to 2022 in this subsector is limited, as consumption had been integrated with RAC servicing.

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

Institutional, policy and regulatory framework

29. Colombia has ratified all amendments to the Montreal Protocol, including the Kigali Amendment on 25 February 2021. In order to comply with these commitments, the Ozone Technical Unit (UTO), from the Environmental, Sectorial and Urban Affairs (DAASU) of the Ministry of the Environment and Sustainable Development, works in coordination and collaboration with different national institutions, to support the ODS consumption reduction and phaseout strategies.

30. Key stakeholders involved in the implementation of the HPMP will continue under the KIP including the Ministry of Foreign Affairs that coordinates the participation of Colombia in meetings and submits reports to the Ozone Secretariat of annual ODS consumption, outreach activities, and exchange of information with respect to specific topics; the Ministry of Trade, Industry and Tourism that controls the trade of ODS, including exchange of information, revision and implementation of procedures and revision of data related to the import and export of ODS and equipment; the National Tax and Customs Direction issues information related to imports and exports of ODS, plays a key role in the control tasks for the entry of ODS into the country, as well as materials and equipment that may be related to ODS, as the need and design of specific tariff subheadings for ODS are factors identified along with the UTO; and SENA which is responsible for implementation of the Labor Competency Standards, supporting the certification project for RAC servicing technicians, the refrigerant recovery, recycling and reclamation (RRR) strategy, and currently has the possibility to implement some refrigerant regeneration centres.

31. With respect to imports of HFCs, the country is currently employing an Environmental licence-based control, subject to a requirement established under Law 99 of 1993, which states that substances controlled by international conventions, such as HFCs under the Kigali Amendment, must apply for an environmental import licence.

32. On 7 February 2024, the Government issued resolution 0130, establishing HFC import regulations and defining annual import quotas to importers that are based on their imports during the baseline years and are provided in CO₂-eq tonnes, allowing importers to increase the metric tonnes of refrigerant they may import by importing lower-GWP refrigerants. The country plans to set future quotas according to the agreed maximum allowable consumption minus a five per cent buffer to account for unforeseen circumstances. The three groups that encompass the HFC import quotas distribution are: Group 1 for existing HFC importers (75 per cent of total consumption); Group 2 for HCFC importers (10 per cent); and Group 3 for importers that have an environmental license to import HFCs and have not imported HFCs in the baseline period (10 per cent), including importers with environmental licenses issued as of 1 January 2023. The amount in CO₂-eq tonnes corresponding to this group will be distributed proportionally to the number of importers that submit the expression of interest to the National Environmental Licensing Authority, but the amount allocated to each importer may not exceed 25 per cent of the available quota for this group.

33. The Indicative Action Plan (PAI) of the Program for the Rational and Efficient Use of Energy and Other Non-Conventional Forms of Energy (PROURE), adopted by the Ministry of Mines and Energy in 2022, has established that energy labelling initiatives and minimum energy performance standards (MEPS) for energy end-use equipment, vehicles and buildings must continue, be strengthened and

implemented. Under the country's nationally appropriate mitigation actions (NAMA), the country has implemented MEPS for domestic refrigerators. Although Colombia has not yet developed MEPS for the commercial refrigeration sector, it has been identified as a priority and is the main activity in the pilot project for energy efficiency submitted to the present meeting.

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

Overarching strategy

34. Stage I proposes to phase down 15 per cent of the country's HFC baseline for compliance through the following activities: the conversion of 27 enterprises manufacturing self-contained equipment in commercial refrigeration, and a subproject to reduce HFC demand in the local assembly and installation of supermarket refrigeration systems. Non-investment activities include strengthening the country's legal framework through regulatory measures and customs capacity-building; strengthening the servicing sector, including MAC, through technician capacity-building, improvements to the training infrastructure, and support to the country's refrigerant RRR network; and awareness-raising campaigns. The operational policy on gender mainstreaming will be incorporated into project activities. Project monitoring and coordination will be implemented by the NOU in coordination with UNDP.

Proposed reductions

35. UNDP used a mathematical model developed by GIZ to project future HFC consumption in the RAC servicing sector based on the 2015 installed base of equipment by specified by sector and subsector. The model is based on an analysis of refrigerant losses within equipment and RAC systems, according to national and international experiences, and takes into account imports and exports of equipment and HFC substances, as well as refrigerant replacements in service activities. The model assumed an annual growth of equipment between 1.5 per cent and 3.2 per cent based on the 2023 medium-term fiscal framework of the Ministry of Finance and Public Credit of the Government of Colombia and projected that in a business-as-usual scenario consumption in the servicing sector would grow from 3,287,628 CO₂-eq tonnes in 2020 to 5,940,528 CO₂-eq tonnes in 2029. While HFC consumption in other sectors was also expected to grow in a business-as-usual scenario, a quantitative description of that growth was not provided.

36. Based on the activities to be undertaken under the KIP, UNDP proposed reductions of 1,297,723 CO₂-eq tonnes to enable the country to reduce HFC consumption by 15 per cent of the country's HFC baseline for compliance.

Proposed activities

Conversion of commercial refrigeration manufacturing enterprises

37. Stage I proposes a subproject to phase out the consumption of HFC-134a, R-404A and R-507A in 27 enterprises manufacturing self-contained commercial refrigeration equipment. HFCs will be replaced by R-290, with a portion of one enterprise also converting to CO₂. The subproject covers all large and medium-sized enterprises manufacturing self-contained commercial refrigeration equipment in the country, as well as many of the small and micro-sized enterprises, for a total planned phase-out of 81.93 mt (285,880 CO₂-eq tonnes), as shown in table 7. The remaining 233.47 mt consumed in RAC manufacturing will be phased out at a later stage.

38. Equipment and technical assistance will be provided according to the specific needs of each enterprise, for a total proposed cost of US \$1,457,000 for UNDP. No IOCs are being requested under this subproject.

Table 7. ICCs for commercial refrigeration manufacturing subproject

Enterprise	HFCs consumed	Consumption (mt)	Consumption (CO ₂ -eq tonnes)	Cost (US \$)
Fagor	HFC-134a	0.00	4	36,900
	R-507A	0.47	1,859	
Imbera*	HFC-134a	0.97	1,386	24,000
	R-404A	0.25	963	
Inducol*	R-404A	0.73	2,857	24,000
Supernordico	HFC-134a	0.55	789	47,900
	R-404A	0.01	31	
	R-507A	0.48	1,909	
Tecnofrio	HFC-134a	0.73	1,037	47,900
	R-507A	0.38	1,514	
Weston*	HFC-134a	0.45	644	385,500
	R-404A	0.81	3,176	
	R-507A	56.99	227,117	
Wonder*	HFC-134a	0.01	10	20,000
	R-404A	0.12	465	
20 micro enterprises**	HFC-134a	13.00	18,590	738,000
	R-404A	6.00	23,530	
<i>Technical assistance</i>		<i>n/a</i>	<i>n/a</i>	<i>132,800</i>
Total		81.93	285,880	1,457,000

* Enterprise also manufactures with R-290

** Average consumption of 0.95 mt

39. Weston consumes HFCs as well as hydrocarbons (R-290) to manufacture stand-alone commercial refrigeration equipment, with a notably high consumption of R-507A. Approximately 25 to 30 per cent of the equipment manufactured by the enterprise will be converted to CO₂ due to the large size of that equipment; the remaining equipment will be converted to R-290. The requested cost of US \$385,500 includes a full hydrocarbon manufacturing package (R-290 charging machine, electronic vacuum controller, rework station, industrial leak detector, ventilation fan, site preparation including ventilation ducts, accessories and spares, and installation and training), full CO₂ manufacturing package (CO₂ charging station, industrial leak detector, stainless steel piping tools, pressure test and safety separation), safety for storage and loading, ultrasonic welding equipment and tools, product design guidance, plant layout guidance, and a complete safety audit.

40. Wonder, Inducol, and Imbera also already manufacture with R-290 and/or R-600a in addition to HFCs and are requesting support to complete their conversion due to needing additional technical assistance (i.e., product design, safety improvements) to enable them to manufacture equipment with a refrigerant charge above 150 grams; no additional equipment is needed to complete these conversions. Wonder has the lowest proposed cost of US \$20,000, which covers guidance on product design and a complete safety audit; Inducol and Imbera request the same, with the addition of an update to their safety systems to comply with standards for working in explosive atmospheres (ATEX).

41. Costs for the remaining enterprises (Fagor, Supernordico, Tecnofrio, and each of the 20 micro enterprises) include a small hydrocarbon manufacturing package (gas monitoring and ventilation system, electronic gauge manifold with hoses, venting hose kit, Lokring sealing tools, recovery station, vacuum pump, leak detectors, nitrogen flushing, charging scale, and installation and training), product design guidance, and plant layout guidance. In addition, Supernordico and Tecnifrio require a safety audit.

42. The cost of technical assistance will be split between all enterprises, with the total of US \$132,800 covering international consultants (US \$40,800), national consultants (US \$72,000), and travel (US \$20,000).

43. Following completion of the manufacturing conversions, the country plans to ban the manufacture and import of HFC-134a-, R-404A-, and R-507A-based stand-alone commercial refrigeration equipment, expected by 1 January 2030.

Support to commercial refrigeration installation and assembly enterprises

44. The assembly subproject aims to strengthen seven enterprises assembling refrigeration equipment by providing them with technical assistance and equipment support to reduce their use of HFCs; these enterprises lead the supply of condensing units and centralized and distributed refrigeration systems for supermarkets, representing approximately 90 per cent of the market share. An estimated 78.00 mt (305,760 CO₂-eq tonnes) of R-404A and R-507A will be phased out and replaced with R-290 for refrigeration systems under 50 kW³ and CO₂ for systems above 50 kW; HFCs with a low GWP (below 300) may also be used depending on end-user requirements. The project is expected to complement related projects in the country and be supported by the national strategy for the supermarket subsector in Colombia.

45. Technical assistance on installation, safety requirements, equipment and suppliers, software licensing, and component selection will be provided to each enterprise. For three of the enterprises consuming a larger proportion of the HFCs consumed in the subsector, each will be provided with an R-290 charging machine with bottle rack and gas sensors; electronic vacuum controller; rework station; industrial leak detector; ventilation fan and controls; for each of the remaining three smaller enterprises, given the lower level of consumption, a mobile refrigerant charging station including a recovery machine, vacuum pump, loading scale, and pressure and vacuum measurement system will be provided. In addition, as the three larger enterprises install and assemble refrigeration systems above 50 kW, those enterprises would each be provided with a CO₂ refrigerant gas charging machine. All enterprises would also receive a tool to measure the performance of the installed system; a portable leak detector; and a tool for cold welding or joining, resulting in costs for the subproject of US \$926,600 for UNDP, as shown in table 8.

Table 8. Costs for the local installation and assembly subproject at seven enterprises as submitted

Description	Cost (US \$)
Equipment provision	
Larger three enterprises for refrigerant systems under 50 kW (R-290): R-290 refrigerant gas charging machine with bottle rack and gas sensors; electronic vacuum controller; rework station; industrial leak detector; ventilation fan and controls	307,500
Larger three enterprises for refrigerant systems over 50 kW (CO ₂): CO ₂ refrigerant gas charging machine	270,000
Smaller four enterprises: Mobile refrigerant charging station	50,000
All enterprises: Tool to measure the performance of the installed system; portable leak detector; and tool for cold welding or joining	51,100
Subtotal	678,600
Technical assistance and training	
Technical assistance for seven enterprises including design and component selection, safety, and optimizing performance	165,000
Licence for updated software for refrigeration system design and training on the use of the software for seven enterprises	63,000
Four training and awareness activities to supermarket end-users	12,000
Two information meetings with suppliers to help build the supply chain	8,000
Subtotal	248,000
Total	926,600

³ 50 kW is equivalent to approximately 14.2 tonnes of refrigeration.

Strengthening the legal framework

46. The regulatory framework will be addressed under stage I in order to support the sustainability of the HFC phase-out. Current regulations on the import and export of HFCs and HFC-containing equipment and products will be assessed, as well as restrictions or bans that will need to be updated or developed. A study would also be completed on the adoption of technical standards to support energy efficiency and the safe use of flammable, toxic, and high-pressure refrigerants in RAC equipment (UNDP) (US \$54,000).

47. The control of HFCs and HFC-based equipment will be supported by strengthening the capacity of customs and national authorities. Activities amount to US \$216,000 and include:

- (a) Provision of and training on analytical equipment for customs laboratories (identifiers, chromatographs, and viscometers) (UNDP) (US \$40,000);
- (b) Support to the National Environmental Licensing Authority to develop an application to improve the control and management of HFC import quotas (UNDP) (US \$70,000);
- (c) Analysis of HFC and polyol refrigerant gases available in the country to identify needs for additional control measures (UNEP) (US \$40,000); and
- (d) Coordination between Government, non-Government, and industry for the implementation of control measures: international consultants (UNEP) (US \$10,000), local consultants (UNDP) (US \$41,000), and workshops and meetings (UNDP) (US \$15,000).

Refrigeration and air-conditioning servicing sector

48. Activities proposed under the RAC servicing sector focus on capacity-building and strengthening existing networks in the country and include support to the MAC subsector; two additional components were included under this sector to support gender mainstreaming and to encourage the implementation of similar projects in the country. The cost for these activities amounts to US \$2,100,950, which includes:

- (a) *Strengthening the infrastructure of RAC training institutions (Germany) (US \$145,250):* Conduct equipment inventories at existing training institutions, prioritizing those in need of equipment and tools for the safe handling of HFCs and their alternatives (US \$12,300); determine technical needs of and provide tools and equipment⁴ to five prioritized training institutions (US \$41,400); provide a portable training module and tools for domestic and commercial refrigeration equipment with flammable refrigerants to remote National Apprenticeship Service (SENA) institutions (US \$69,500); develop a strategy to sustain the strengthened infrastructure (US \$22,050);
- (b) *Strengthening the training and certification of trainers and assessors (Germany) (US \$170,900):* Develop a training programme on the management of HFCs and the safe and sustainable use of low-zero GWP alternatives comprised of specialized courses for training of trainers and assessors (US \$92,000); and training of 120 trainers and evaluators under the new programme, covering a period of four years (US \$78,900);
- (c) *Strengthening the training and certification of technical personnel in RAC (Germany) (US \$125,300):* Develop a specialized course for the safe servicing of MAC and refrigerated transport (US \$10,300); update sector-specific SENA competency standards related to HFCs, flammable, and high-pressure refrigerants; (US \$40,000); and conduct a

⁴ Including vacuum pump, vacuum gauge, 4-way manifold with hoses, charging scale, thermometer, recovery unit, core removal tool, piercing valve, connection adapter, pipe cutter, tube deburrer, tube expansion toolkit, tube benders, clamp multimeter, screwdrivers, and pliers; three institutions will also receive a set of hand crimping connection tools.

feasibility study on using private sector institutions as certification bodies for competency standards in RAC (US \$75,000);

- (d) *Promoting training and certification of technical personnel in RAC (UNDP) (US \$210,000)*: Awareness campaign for secondary school students, apprentices, and technical staff in the RAC sector on the training, certification, and recognition of prior learning processes, and job opportunities in the sector (US \$50,000); develop a training and certification programme with national educational institutions to be implemented across 20 cities that includes courses on handling HFCs and flammable refrigerants and courses using the portable training module for domestic and commercial refrigeration systems (US \$130,000); and develop partnerships to implement a pilot RAC training programme for secondary school students (US \$30,000);
- (e) *Supporting good servicing practices in MAC and refrigerated transport (UNDP) (US \$192,500)*: Develop a report characterizing the country's MAC servicing subsector, including refrigerant inventories and involved stakeholders and workshops (US \$25,000); provide tools and equipment⁵ for the proper handling of HFC and HFO refrigerants in MAC and refrigerated transport systems to 32 selected MAC service workshops (US \$155,000); and ten workshops to train 200 technicians on good practices for the proper handling of HFC and HFO refrigerants in MAC and transport refrigeration (TR) systems (US \$12,500);
- (f) *Increasing capacity of the RRR network (UNDP) (US \$412,000)*: Provide HFC and HFC blend reclamation machines to four (of five) reclamation centres, update software and chromatographs of each reclamation centre, and provide 10 refrigerant identifiers to selected collection centres (US \$219,000); conduct 10 workshops on the proper recovery of HFC blends, and develop a case study and prototype separation system for the effective recovery and reuse of zeotropic HFC blends (US \$95,000); and strengthen communication of the RRR network through ten HFC identification and collection campaigns, the maintenance and update of the refrigerant management operating system and mobile application, and five technical committee meetings to discuss how to strengthen HFC reclamation in the country (US \$98,000);
- (g) *Technical assistance for the transition to alternative refrigeration technologies (UNDP) (US \$565,000)*: Formulate national strategies to reduce the environmental impact and improve the energy consumption of refrigeration systems and equipment in the food cold chain, health sector, and agro-industrial sector (US \$190,000); conduct six technical studies in the industrial and commercial refrigeration sectors on transitioning to HFC-free, low-GWP, and energy-efficient refrigeration technologies, and produce three document with the results (US \$300,000); and six events to disseminate the results of activities and lessons learned (US \$75,000);
- (h) *Awareness-raising (UNDP) (US \$50,000)*: Carry out four digital awareness campaigns to raise awareness across sectors of the actions and importance of the Montreal Protocol and HFC reduction (US \$20,000); and promote low-GWP and energy-efficient technologies to sectoral and public end users through digital campaigns, printed media, and impact surveys (US \$30,000);
- (i) *Gender mainstreaming (UNDP) (US \$200,000)*: Recruit a gender expert, conduct a gender assessment, formulate and implement a gender action plan, and link women's RAC

⁵ Including 21 basic MAC kits (service manifold, recovery and recycling machine, 30 lb and 100 lb recovery cylinders, leak detector, vacuum gauge, fitting and valves, charging scale, vacuum pump, infrared thermometer, and safety glasses and gloves) and 11 intermediate MAC kits (automatic recovery, recycling, and recharge machine with fitting and valve set, 30 lb and 100 lb recovery cylinders, leak detector, infrared thermometer, and safety glasses and gloves).

networks with RAC associations in the country, with a cost breakdown as follows: promote gender-responsive knowledge management (US \$18,500); build capacity to mainstream gender in specific activities of the KIP (US \$91,000); advance labour inclusion and strengthen women's leadership in RAC, including by providing toolkits⁶ to 20 women (US \$80,500); and promote the prevention of gender-based violence in the RAC sector (US \$10,000);⁷ and

- (j) *Project funding guide (UNDP) (US \$30,000)*: Provide guidance on national and private funding opportunities for projects in the country (e.g., from local energy service companies, local banks, etc.) that promote the adoption of HFC-free, low-GWP, and energy-efficient technologies, with a cost breakdown as follows: identify funding needs and opportunities, and prepare a reference document containing funding guidelines and tools (US \$25,000); and three workshops to disseminate the information (US \$5,000).

Project implementation, coordination and monitoring

49. The national ozone unit (NOU) and UNDP will coordinate and monitor activities, report on progress, and work with stakeholders to implement project activities and phase down HFCs. The cost of those activities for UNDP amounts to US \$475,450, and includes international consultants (US \$30,000), local consultants (US \$394,200), domestic travel (US \$25,000), and meetings and workshops (US \$26,250).

Gender policy implementation

50. While a gender analysis was not completed during the preparation of the KIP, a number of activities were proposed to incorporate gender mainstreaming activities into the RAC sector as well as specific project activities.⁸ The NOU, with the support of UNDP, formulated the guidelines, criteria and minimum protocols for gender mainstreaming in projects in the RAC sector to support the technical teams in charge of the preparation and implementation of the activities in the KIP. The objectives are to promote gender-responsive communication and knowledge management; build capacity to mainstream gender in specific activities; advance labour inclusion and strengthen women's leadership; and promote the prevention and elimination of gender-based violence in the RAC sector. Under the KIP, the country plans to recruit a gender expert to support at least 20 people from the NOU and other relevant stakeholders to incorporate and strengthen gender-related tasks in KIP projects; conduct a gender analysis in order to establish a baseline by which to monitor gender equality results, ensuring that quantitative data collected for reporting purposes are disaggregated by sex, where applicable; formulate and implement a gender action plan; and promote an agreement linking the RAC Women's Network of Colombia to the Colombian Association of Air Conditioning and Refrigeration and other associations at regional level. A gender mainstreaming checklist and performance indicators were included in the submission.

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

51. Stage I of the KIP has been planned in harmony with stage III of the HPMP, which will overlap from 2024 to 2030; notably, technician training, certification, and strengthening of the RRR network will be implemented simultaneously under both projects, which has been taken into account in project planning. Training under the KIP will involve good and safe servicing practices for a wider range of alternative refrigerants and specialized equipment to phase out HFCs, and further action will be taken to improve the

⁶ Each toolkit would include a vacuum pump, digital vacuum gauge, 4-way manifold with pressure gauges and hose set for HCFCs and HFCs, electronic charging scale, HFC recovery unit, thermometer, and recovery cylinders

⁷ Further details on activities are described in paragraph 50.

⁸ A breakdown of costs is described in paragraph 48(i).

energy efficiency of equipment and servicing practices. A comparison of activities between the HPMP and KIP is contained in annex II to the present document.

Total cost of stage I of the Kigali HFC implementation plan

52. The budget for stage I has been proposed at US \$5,230,000. The costs of activities in the refrigeration servicing sector have been proposed in line with decision 92/37. In the absence of cost funding guidelines, the funding requested for activities in the manufacturing and local installation and assembly sectors is the best available estimate provided by UNDP.

53. The proposed activities and cost of stage I of the KIP are summarized in table 9.

Table 9. Proposed cost of activities to be implemented under stage I of the KIP for Colombia

Sector	Agency	Cost (US \$)
Investment components		
<i>Manufacturing</i>	UNDP	1,457,000
<i>Local installation and assembly</i>	UNDP	926,600
Non-investment components		
<i>Legal framework (US \$270,000)</i>		
Regulations and technical standards	UNDP	54,000
Customs capacity-building	UNDP	166,000
Customs capacity-building	UNEP	50,000
<i>Servicing (US \$2,100,950)</i>		
Infrastructure of RAC training institutions	Germany	145,250
Training and certification of trainers and assessors	Germany	170,900
Training and certification of technical personnel in RAC	Germany	125,300
Promotion of training and certification of technical personnel in RAC	UNDP	210,000
Good servicing practices in MAC and refrigerated transport	UNDP	192,500
Capacity-building of the RRR network	UNDP	412,000
Technical assistance	UNDP	565,000
Awareness-raising	UNDP	50,000
Gender mainstreaming	UNDP	200,000
Project funding guide	UNDP	30,000
<i>PMU</i>	UNDP	475,450
Total		5,230,000

54. Table 10 summarizes the phase-out and cost-effectiveness by KIP component, as submitted.

Table 10. Proposed phase-out and cost-effectiveness (CE) by KIP component, as submitted

Sector	Phase-out (mt)	Phase-out (CO ₂ -eq tonnes)	Cost (US \$)	CE (US \$/kg)	CE (US \$/CO ₂ -eq tonne)
Investment component					
Manufacturing	81.93	285,880	1,457,000	17.78	5.10
Local installation and assembly	78.00	305,760	926,600	11.88	3.03
Non-investment component					
Legal framework	52.94*	706,083**	270,000	5.10	3.35**
Servicing	411.95*		2,100,950		
PMU	0	0	475,450	n/a	n/a
Total	624.82	1,297,723	5,230,000	8.37	4.03

* Calculated by the Secretariat.

** As submitted by UNDP. The phase-out in the servicing sector is further discussed in paragraph 58 of the present document.

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

55. The first funding tranche of stage I of the KIP, in the total amount of US \$3,128,000, comprises 60 per cent of all stage I activities and will be implemented between December 2024 and December 2027. An overview of activities and associated costs is presented in table 11.

Table 11. Proposed cost of activities to be implemented under the first tranche of stage I of the KIP for Colombia

Sector	Agency	Cost (US \$)
Investment components		
<i>Manufacturing</i>	UNDP	874,200
<i>Local installation and assembly</i>	UNDP	555,960
Non-investment components		
<i>Legal framework (US \$162,000)</i>		
Regulations and technical standards	UNDP	35,000
Customs capacity-building	UNDP	67,000
Customs capacity-building	UNEP	50,000
<i>Servicing (US \$1,260,570)</i>		
Infrastructure of RAC training institutions	Germany	87,150
Training and certification of trainers and assessors	Germany	102,540
Training and certification of technical personnel in RAC	Germany	75,180
Promotion of training and certification of technical personnel in RAC	UNDP	126,000
Good servicing practices in MAC and refrigerated transport	UNDP	115,500
Capacity-building of the RRR network	UNDP	247,200
Technical assistance	UNDP	339,000
Awareness-raising	UNDP	30,000
Gender mainstreaming	UNDP	120,000
Project funding guide	UNDP	18,000
<i>PMU</i>	UNDP	285,270
Total		3,128,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

V. Comments

56. The Secretariat reviewed stage I of the KIP for Colombia in light of the existing policies and guidelines of the Multilateral Fund, including decisions 91/38,⁹ 92/37,¹⁰ and 92/39(d),¹¹ stage III of the HPMP, and the 2024–2026 business plan of the Multilateral Fund.

Overarching strategy

57. In line with decision 92/44, the Government of Colombia has expressed its commitment to supporting reductions in HFC consumption in advance of Montreal Protocol targets.¹²

⁹ In the absence of the cost guidelines for HFC phase-down, to consider HFC individual investment projects and stage I of KIPs on a case-by-case basis, without setting a precedent for the cost guidelines or any future HFC individual investment projects and stage I of KIPs.

¹⁰ Level and modalities of funding for HFC phase-down in the refrigeration servicing sector.

¹¹ To consider projects in the local installation and assembly subsector in the context of KIPs on a case-by-case basis.

¹² As per the letter of 24 July 2024 from the Ministry of Environment and Sustainable Development of Colombia to UNDP.

HFC consumption in the baseline years and reduction targets

58. Due to an inadvertent error, UNDP calculated the reductions in remaining consumption from the servicing sector to be 706,083 CO₂-eq tonnes; based on the 2020-2022 servicing sector consumption reported by the country under its CP data report, and in line with the methodology described in annex I of document UNEP/OzL.Pro/ExCom/93/97, the reductions would be 1,007,148 CO₂-eq tonnes, which would bring the total reductions under stage I of the KIP to 18.5 per cent of the country's HFC baseline. As further detailed below, UNDP and the Secretariat had detailed discussions on the scope of activities to be undertaken in the servicing sector to ensure the country could commit to a target in 2029 commensurate to those activities.

59. The Secretariat further noted that the country's 2023 HFC consumption was already 28 per cent below the country's HFC baseline for compliance, while the proposed 2029 target was a 15 per cent reduction from the country's HFC baseline. Moreover, consumption in 2022 increased by approximately 80 per cent relative to the 2021, and the average 2019-2021 consumption. Part of that increase is due to the combined effects of the post-COVID-19 recovery and the increased HFC demand in the country. In addition, a new importer that accounted for 25 per cent of the country's 2022 imports in CO₂-eq tonnes is included in the country's calculated consumption; however, the Secretariat is not clear whether those imports were used in the country in the year they were imported, or the subsequent year. Those imports, and the small export of HFCs contained in exported pre-blended polyols discussed below, would represent 809,617 CO₂-eq tonnes, or 9.4 per cent of the country's calculated HFC baseline for compliance.

60. The Secretariat noted that the 2022 fluctuation in consumption was not consistent with the equipment model developed by GIZ. In addition, the servicing sector consumption reported by the country differed from that estimated in GIZ's model. For example, in 2020 the country reported consuming approximately 4.5 million CO₂-eq tonnes in the servicing sector while the model suggested a consumption of approximately 3.3 million CO₂-eq tonnes. While it is unlikely this discrepancy would affect the country's HFC phase-down strategy, it reflects the challenge Article 5 countries in understanding their HFC consumption trends.

61. In addition, and notwithstanding best efforts by the country, UNDP noted that there is uncertainty in the distribution of HFC consumption between the RAC manufacturing and local assembly and installation subsector. The data provided in the submission provides the best estimate of that distribution at the time of submission; the country may gain a better understanding of that distribution with the implementation of the KIP, which may result in a revision to the sectoral distribution of consumption reported under the country's CP data reports.

Exports of HFCs contained in pre-blended polyols

62. The country imports a blend of HFC-365mfc/HFC-227ea for use by systems houses to manufacture pre-blended polyols; in addition, some of that blend is exported (i.e., it is exported as a blend and not contained in exported pre-blended polyols). Some of HFC-365mfc/HFC-227ea contained in pre-blended polyols is used by enterprises in the country to manufacture PU foam and, starting in 2022, some is exported. In particular, in 2022 the country imported 229.92 mt of the HFC-365mfc/HFC-227ea blend and exported 87.57 mt (84,402 CO₂-eq tonnes) of the blend contained in pre-blended polyols; the former imports are included in the country's calculated HFC consumption under Article 7, and are therefore included in the calculation of the country's HFC baseline, while the latter exports are not considered in that calculation because the HFC blend is contained in a product (i.e., the pre-blended polyols).

63. The country reported those exports, and the 2023 export of 60.73 mt (61,935 CO₂-eq tonnes) of HFC-365mfc/HFC-227ea contained in pre-blended polyols, under its respective CP data report. The Executive Committee will consider at the present meeting a note on the issue of HFCs contained in imported

pre-blended polyols in the PU foam sector in Article 5 countries (decision 93/34).¹³ The country's reporting of HFCs contained in exported pre-blended polyols under its CP data for the years 2020-2022 is consistent with paragraph 17(d) of that note.

Institutional, policy and regulatory framework

HFC licensing and quota system

64. In line with decision 87/50(g), UNDP has confirmed that Colombia has an established and enforceable system of licensing and quotas for monitoring HFC imports/exports in place. UNDP informed that the quota assigned in 2024 corresponds to the value of the baseline established for the country of 8,652,982 CO₂-eq tonnes, and for 2025 the quota will be the same as for 2024. While the HFC licensing system was established in 2007, the quota system became operational on 7 February 2024. UNDP confirmed that the two imports of HFCs that took place between 1 January and 7 February 2024 were retroactively accounted for by deducting those imports from the respective importers' quotas.

RAC technician certification scheme

65. Comprehensive training of RAC technicians, including on the safe use of flammable refrigerants, and the certification of those technicians, has been undertaken under the country's HPMP. Certification is carried out by SENA; one goal of the activities under the KIP is for the National Accreditation Agency to accredit other bodies to certify technicians, thereby making it easier for technicians to become certified. While certification is competency-based, it is not mandatory. Mandatory certification in labor competencies in the country has been restricted to those occupations with significant labor risks, including work accidents and occupational diseases, or where there is a specific expertise needed for work performance. A labor competency standard for MAC technicians has already been developed; under the KIP, the standard will be updated and evaluation instruments developed, which will enable the (voluntary) certification of MAC technicians.

Ban on the import and manufacture of HFC-based equipment

66. All local domestic refrigeration manufacturers in the country had already converted from HFC-134a to R-600a with their resources. In line with those conversions, the Government has already issued and implemented a ban on the manufacture and import of HFC-based domestic refrigerators under resolution 634 of 2022. Regarding the ban on the import and manufacture of HFC-based stand-alone commercial refrigeration equipment, it was agreed that, given the administrative and procedural steps required to finalize a ban, the country would issue the ban by 1 July 2028; however, the ban would only enter into force one year later, by 1 July 2029. The additional time required for the entry into force of the ban is needed because there may be additional enterprises manufacturing self-contained commercial refrigeration equipment beyond the 27 enterprises participating in the KIP and those enterprises may require additional time to phase out their consumption, which will be achieved without additional assistance from the Multilateral Fund. UNDP will include in progress reports submitted under the KIP the names and consumption of any such additional enterprises; that consumption will be deducted from the country's remaining consumption eligible for funding when stage II of the KIP is submitted.

67. While consumption of R-508B in the country is very small, the GWP of this blend is high. Noting that R-508B-based equipment already existing in the country that may need to continue to be serviced for some time, the Secretariat inquired whether the country considered implementing restrictions (e.g., a ban) on the import of new R-508B-based equipment so as to avoid adding to the bank of such equipment, which would result in additional future servicing needs. Similarly, noting that the country first reported importing HFC-236fa in 2022, that existing HFC-236fa-based fire protection equipment may need to continue to be

¹³ Document UNEP/OzL.Pro/ExCom/95/58

served for some time, there may be value in considering implementing restrictions (e.g., a ban) on the import of new HFC-236fa-based fire protection equipment. UNDP clarified that the country had not considered such restrictions under stage I of the KIP.

Technical and cost-related issues

Manufacturing sector

68. UNDP and the Secretariat had detailed discussions on the proposed equipment and technical assistance to be provided to the 27 enterprises, resulting in the following agreed adjustments:

- (a) For those enterprises already manufacturing with R-290 (i.e., Imbera, Inducol, Weston, and Wonder) that requested funding for a safety audit and ATEX guidance, the enterprises would co-finance those at 50 per cent, noting that the enterprises should have already undertaken those;
- (b) While Weston has manufactured a limited number of stand-alone units with R-290, its manufacturing is overwhelmingly dominated by HFC-based manufacturing. Given the very limited R-290-based manufacturing undertaken so far, it has charged equipment manually (i.e., using a cylinder and scale). It was agreed that the enterprise needed to upgrade some of its equipment and safety systems; accordingly, the Secretariat considered the following incremental: an R-290 charging machine, ATEX vacuum pump, 3 handheld hydrocarbon leak detectors, ventilation and safety, industrial ultrasonic welding machine, shipping and safety audit, resulting in agreed funding of US \$136,050. In addition, the enterprise manufactures some stand-alone systems that are substantially larger than those manufactured by the other enterprises and, therefore, wishes to manufacture those larger units with CO₂. On an exceptional basis, and without setting a precedent, additional funding of US \$95,063 was agreed (for a total of US \$231,113) on the understanding that the enterprise will phase out at least 5 mt of HFCs by manufacturing CO₂-based stand-alone commercial refrigeration equipment. UNDP will report on the quantity of HFCs phased out through CO₂-based equipment manufactured by the enterprise upon completion of the project. If the enterprise manufactured less than 5 mt, the enterprise will return to the Multilateral Fund through UNDP US \$19.01/kg plus agency support costs for every kilogram not manufactured with CO₂;
- (c) The costs of the small hydrocarbon manufacturing package for Fagor, Supernordico, Tecnofrio, and each of the 20 micro enterprises were rationalized based on the cost of gas monitoring, ventilation system, zone separation, in line with past precedent projects; removing the vacuum pump and nitrogen flushing, which should already be in the baseline, the second leak detector, and a small adjustment to the shipping costs, resulting in agreed costs US \$26,000 per package; and
- (d) UNDP had included technical assistance for product guidance separately for each enterprise. In order to maximize the efficiency of the assistance provided, all product guidance was included in a single dedicated technical assistance programme. This programme will provide more assistance to the 20 microenterprises and the three enterprises that are not already manufacturing with R-290; however, assistance will also be provided to those enterprises already manufacturing with R-290, including to optimize designs for equipment with charges above 150 g/circuit, resulting in agreed costs of US \$238,400 for the technical assistance programme, as summarized in table 12 below.

Table 12. Agreed costs for the manufacturing sector

Enterprise	mt	CO ₂ -eq tonnes	Cost (US \$)
Weston*	58.25	230,937	231,113
Fagor	0.47	1,863	26,000
Wonder*	0.13	475	4,000
Inducol*	0.73	2,857	6,000
Imbera*	1.21	2,349	6,000
Supernordico	1.04	2,729	31,000
Tecnofrio	1.11	2,551	31,000
20 micro enterprises	19.00	42,120	520,000
<i>Dedicated technical assistance programme, including product design</i>			238,400
Total	81.93	285,880	1,093,513

* Enterprise already manufactures with R-290

Local assembly and installation subsector

69. In line with decision 92/39(d), the Secretariat reviewed the subproject in the local assembly and installation subsector on a case-by-case basis, taking into consideration its contribution to stage I of the KIP, experience gained from a limited number of projects for this sector previously submitted, and the information contained in documents UNEP/OzL.Pro/ExCom/92/49 and UNEP/OzL.Pro/ExCom/93/99 related to the subsector.

70. The Secretariat noted that the enterprises were not in a position to commit to cease assembling and installing R-404A- and R-507A-based systems, and that the country was not in a position to implement regulations that would require the use of R-290 in supermarket refrigeration systems below 50 kW and CO₂ in systems above 50 kW, and sought to better understand how the sustainability of the phase-down to be achieved would be ensured. UNDP emphasized that the subproject is part of the joint actions agreed with the supermarket sector within the framework of the national strategy for the implementation of measures and alternatives to reduce the direct environmental impact and improve the energy consumption of commercial refrigeration systems in the supermarket subsector. The phase-down will be sustained by the increased demand for low- or zero-GWP technologies in the subsector, particularly when supermarkets renovate existing stores or establish new stores. UNDP further noted that the largest supermarket chain, Éxito, incorporated its commitment to adopting low- or zero-GWP technologies in the country's nationally determined contributions (NDCs).¹⁴ UNDP further emphasized that the subproject would complement a pilot project funded bilaterally by the Government of Canada to enable the uptake of CO₂-based centralized refrigeration systems at smaller supermarkets.

71. In light of the above explanations, the Secretariat and UNDP had detailed discussions on the planned activities and equipment to be provided under the subproject. In particular, the Secretariat considered it meaningful to propose that assistance be provided to the enterprises to enable them to develop and install prototype refrigeration systems at a limited number of supermarkets, to monitor the performance and energy efficiency of those systems, and then to disseminate the results so as to highlight the benefits of the R-290- and CO₂-based systems, including the savings achieved through the improved energy efficiency of the systems. In addition, the Secretariat noted that for three of the enterprises, equipment was being requested typically associated with manufacturing conversions and that such equipment was neither incremental nor practical for the subsector given that the refrigeration systems are charged with refrigerant at the end-user and not at the factory. In relation to the pre-charging of components at the factory referred to by UNDP, the Secretariat confirmed that components should be transported from the factory to the end-user with a holding charge; however, that holding charge should be a low-pressure nitrogen charge (ca. 10 to 15 pounds per square inch) to prevent corrosion or ingress of air or water into the components prior

¹⁴ The update of Colombia's NDC was approved at the ninth session of the Intersectoral Commission on Climate Change, on December 10, 2020.

to assembly and charging at the end user; pre-charging of components with a flammable refrigerant is not recommended.

72. Subsequent to detailed discussions, the following changes to the subproject were agreed:

- (a) *Equipment provision:* provision for each enterprise of an R-290 refrigerant handling package (including ATEX fan, R-290 leak detector, four-way digital manifold with hoses and ball valve, refrigerant cylinders, Lokring tool and spare parts, digital thermocouple, and R-290 recovery machine) and for the three larger enterprises a mobile charging kit for CO₂ (including four-way digital manifold with steel hoses, refrigerant cylinders, CO₂ leak detectors) at a total cost of US \$98,900;
- (b) *Development and installation of ten prototype refrigeration systems:*
 - (i) Seven R-290-based conservation cold rooms, with medium temperature (0 to 4°C), refrigeration capability 20 HP ($\pm$ 5 HP), with one cold room and two evaporators at a cost of US \$31,300 per system;
 - (ii) Three CO₂-based intramural cooling districts comprising a low temperature refrigeration system (-25 to -18°C, refrigeration capacity of 4 ($\pm$ 1) kW, with one or two cabinets), a medium temperature refrigeration system (0 to 4°C, refrigeration capacity of 22 ($\pm$ 2) kW, with three or four cabinets), and an AC system (18°C, refrigeration capacity of 195 ($\pm$ 10) kW, with 9 to 11 handling units or fan coils) for US \$120,000 per system; and
 - (iii) Monitoring the performance and energy use of ten prototype installations for at least three months, and dissemination of the results to supermarkets to highlight the savings from the improved energy efficiency of the systems (US \$12,000). This monitoring could be continued under a pilot project to demonstrate the use of digital monitoring and management tools to enhance energy efficiency and reduce the emissions of greenhouse gases in the space cooling and cold chain sectors in Colombia, if approved at a future meeting of the Executive Committee.¹⁵ In addition, UNDP will include a report on the implementation of these prototype development and installation projects in future tranche progress reports;
- (c) *Technical assistance and training:* The trainings and awareness activities for end-users, information meetings to establish the supply chain, and the license and specialized training on updated software were agreed as submitted (US \$83,000), while the technical assistance on design and component selection, safety, and optimizing performance was rationalized at US \$15,000 per enterprise, resulting in a total agreed cost of US \$878,000, as summarized in table 13.

Table 13. Agreed costs for the local installation and assembly subproject (US \$)

Description	Cost
Equipment provision	
Seven R-290 refrigerant handling packages and three mobile charging kits for CO ₂	98,900
Pro-type design, installation, monitoring and dissemination of energy efficient R-290 and CO₂ refrigeration systems in the supermarket subsector	
Seven R-290 cold rooms with refrigeration capacity 20 ($\pm$ 5) HP	219,100

¹⁵ The Executive Committee approved the request for the preparation of a global pilot project to demonstrate the use of digital monitoring and management tools to enhance energy efficiency and reduce the emissions in inter alia cold chain sector in Colombia, amongst other countries (decision 94/25).

Description	Cost
Three CO ₂ -based intramural cooling districts with low- and medium-temperature refrigeration systems, and AC	360,000
Monitor the performance and energy use of ten prototype installations for at least three months, and dissemination of the results to supermarkets	12,000
Technical assistance and training	
Technical assistance for seven enterprises including design and component selection, safety, and optimizing performance	105,000
License for updated software for refrigeration system design and training on the use of the software for seven enterprises	63,000
Four training and awareness activities to supermarket end-users	12,000
Two information meetings with suppliers to help build the supply chain	8,000
Total	878,000

73. The estimated phase-out was based on the 2023 consumption of the enterprises participating in the project used to assemble and install centralized and distributed refrigeration systems. It was agreed to adjust the phase-out of 78 mt of HFCs based on the relative distribution of R-404A and R-507A reported by the enterprises, resulting in a phase-out of 308,687 CO₂-eq tonnes (vice the initially estimated 305,760 CO₂-eq tonnes) and a cost effectiveness of US \$11.26/kg or US \$2.84/CO₂-eq tonne.

Legal framework

74. Regarding the analytic equipment that will be provided to customs laboratories, UNDP clarified that a refrigerant identifier and three viscometers would be provided, resulting in adjusted funding of US \$15,000 for this activity (i.e., a US \$25,000 reduction from the costs as originally submitted).

Servicing sector

75. In line with paragraph 58 above, the following adjustments to the servicing sector activities were agreed:

- (a) *Strengthening the infrastructure of RAC training institutions (Germany)*: rationalization in the costs to undertake equipment inventories, in light of work already undertaken, and to monitoring-related activities, resulting in a reduction of US \$6,425;
- (b) *Strengthening the training and certification of trainers and assessors (Germany)*: rationalization in the costs related to the development of the training programme in line with past precedent projects, resulting in a reduction of US \$26,000;
- (c) *Strengthening the training and certification of technical personnel in RAC (Germany)*: noting that the labor competency standards were updated under stage II and III of the HPMP, removing that update, resulting in a reduction of US \$40,000;
- (d) *Promoting training and certification of technical personnel in RAC (UNDP)*: the Secretariat proposed to increase the funding related to training and certification programme to enable at least 750 RAC technicians to be trained and certified in good servicing practices, including handling safe handling of flammable, toxic and high-pressure refrigerants, resulting in an increase of US \$95,000;
- (e) *Supporting good servicing practices in MAC and refrigerated transport (UNDP)*: noting the need to train MAC technicians, the Secretariat proposed to increase the funding by US \$92,795 to ensure at least 500 MAC technicians are trained on good practices for the proper handling of HFC and HFO refrigerants in MAC and TR systems;

- (f) *Increasing capacity of the RRR network (UNDP):* rationalization in the costs related to monitoring under the component, resulting in a reduction of US \$60,000; and
- (g) *Technical assistance for the transition to alternative refrigeration technologies (UNDP):* rationalization in the costs related to development of strategies in the food cold chain, health sector, and agro-industrial sector by taking advantage of synergies across those three sectors, resulting in a reduction of US \$60,000.

76. In addition, UNDP and the Secretariat had detailed discussions related to the proposed six technical studies in the industrial and commercial refrigeration sectors on transitioning to HFC-free, low-GWP, and energy-efficient refrigeration technologies. UNDP clarified that six end-user demonstration projects would be undertaken at a cost of US \$375,000:

- (a) Four centralized, distributed or remote industrial refrigeration systems with R-507A used in meat, dairy, fruit and vegetable pre-cooling subsector with a refrigeration capacity of at least 20 HP would be replaced with R-290-based systems. The end-user will monitor the performance and energy efficiency of the systems, and co-finance approximately 60 per cent of the costs of the system, including the costs related to monitoring and the sound disposal of the baseline R-507A refrigerant and equipment;
- (b) Demonstration of the use of R-449A as a drop-in refrigerant in a centralized or industrial refrigeration systems based on R-507 or R-404A with a refrigeration capacity above 100 kW in the agricultural or industrial sector. The end-user will monitor the performance and energy efficiency of the system, and co-finance an unspecified fraction of the costs, including the costs related to monitoring, the sound disposal of the baseline R-507A or R-404A refrigerant, and the rental of a backup refrigeration system, which is needed during the transition;
- (c) In the health sector, a distributed refrigeration system based on R-507 or R-404A with a refrigeration capacity less than 20 HP will be replaced with an R-290-based system. The end-user will monitor the performance and energy efficiency of the system, and co-finance the evaporation circuit, installation of the system, the costs related to monitoring, and the sound disposal of the baseline R-507A or R-404A refrigerant and equipment.

77. In line with decision 92/36(g), UNDP will submit a final report on the implementation of these six end-user projects, including the HFC phase-out and energy-efficiency gains achieved.

78. Based on the agreed costs of US \$525,000 for strengthening the legal framework and US \$1,805,900 for the servicing sector, and in line with the methodology for converting US \$/kg to US \$/CO₂-eq tonne in the servicing sector described in annex I of document UNEP/OzL.Pro/ExCom/93/97, the reduction from the country's remaining HFC consumption eligible for funding from those activities is 990,157 CO₂-eq tonnes, as summarized in table 14 below.

Project management unit

79. Funding for the project management unit (PMU) was agreed at US \$387,222 calculated at 9 per cent of the project costs.

Total project cost

80. At the total cost of US \$4,689,684, stage I of the KIP for Colombia will result in a reduction of 1,587,724 CO₂-eq tonnes from the country's HFC consumption eligible for funding, as summarized in

table 14. In light of those agreed reductions, the Government agreed to reduce its 2029 HFC consumption to 7,068,258 CO₂-eq tonnes, a reduction of 18.3 per cent of the country's HFC baseline for compliance.

Table 14. Agreed cost of activities and associated phase-out during stage I of the KIP in Colombia

Sector	Phase-out (mt)	Phase-out (CO ₂ -eq tonnes)	Cost (US \$)	CE (US \$/kg)	CE (US \$/CO ₂ -eq tonne)
Investment component					
Manufacturing	81.93	285,880	1,093,513	13.35	3.83
Local installation and assembly	78.00	308,687	878,000	11.26	2.84
Non-investment component					
Legal framework	48.04	990,157	245,000	5.10	3.35
Servicing	409.01		2,085,950		
PMU	0	0	387,222	n/a	n/a
Total	616.98	1,584,724	4,689,685	7.60	2.96

81. Stage I of the KIP will be implemented in two tranches. In line with decision 94/59(b), and to reduce the country's reporting obligations and administrative burden, it was agreed to request the Executive Committee to revise the Agreement for stage III of the HPMP by shifting the third tranche from 2026 to 2027, and to amend Appendix 3-A to indicate that future tranches would be submitted to the first meeting of the year, thereby enabling the country to submit to the same meeting in 2027 and 2029 the requests for the respective tranches of the KIP and HPMP. The schedule of HFC phase-down and HCFC phase-out commitments and of the KIP and HPMP tranches is presented in annex I to the present document, and the revised draft Agreement for stage III of the HPMP in annex III to the present document. The full updated Agreement will be appended to the final report of the 95th meeting and supersedes the Agreement reached between the Government of Colombia and the Executive Committee at the 88th meeting of the Executive Committee by decision 88/57.

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

82. Cost of activities to be implemented under the first tranche, as agreed, are shown in table 15.

Table 15. Agreed cost of activities to be implemented under the first tranche of stage I of the KIP for Colombia

Sector	Agency	Cost (US \$)
Investment components		
<i>Manufacturing</i>	UNDP	1,023,513
<i>Local installation and assembly</i>	UNDP	341,100
Non-investment components		
<i>Legal framework (US \$145,000)</i>		
Regulations and technical standards	UNDP	27,000
Customs capacity-building	UNDP	118,000
<i>Servicing (US \$1,260,570)</i>		
Infrastructure of RAC training institutions	Germany	138,525
Training and certification of trainers and assessors	Germany	86,000
Training and certification of technical personnel in RAC	Germany	34,300
Promotion of training and certification of technical personnel in RAC	UNDP	168,000
Good servicing practices in MAC and refrigerated transport	UNDP	225,225
Capacity-building of the RRR network	UNDP	234,000
Technical assistance	UNDP	150,000
Awareness-raising	UNDP	25,000
Gender mainstreaming	UNDP	119,000
Project funding guide	UNDP	0
<i>PMU</i>	UNDP	124,148
Total		2,813,811

2024-2026 business plan of the Multilateral Fund

83. UNDP, the Government of Germany, and UNEP are requesting US \$4,689,685, plus agency support costs, for the implementation of stage I of the KIP for Colombia. The total value of US \$3,026,307, including agency support costs, requested for the period of 2024–2026, is US \$275,118 below the amount in the business plan.

Sustainability of the HFC phase-down and assessment of risks

84. Colombia has a comprehensive policy and regulatory framework that has enabled the country to remain in compliance with its HPMP targets, which are in advance of the Montreal Protocol control schedule. The stage I of the KIP builds on the achievements made by the country under the HPMP to further strengthen that policy and regulatory framework to enable sustained reductions in HFC consumption in advance of the Montreal Protocol control schedule. Similarly, RAC technician training institutions will be further strengthened under the KIP to ensure the availability of trained and qualified RAC technicians in the country capable of safely handling low-GWP alternatives and reducing HFC consumption; an additional 750 RAC technicians will be trained and certified under the KIP. Equipment will be procured to enable training of MAC technicians, and at least 500 MAC technicians will be trained. As training of MAC technicians has not been supported by the Multilateral Fund for decades, the training and capacity building under stage I of the KIP will need to be continued in subsequent stages of the KIP.

85. The Secretariat considers the risks to the sustainability of the conversion of the stand-alone commercial refrigeration sector to be low. Several of the enterprises participating in the project had already initiated the conversion to R-290, which resulted in a relatively low level of HFC consumption for those enterprises and, conversely, a less cost-effective transition: while those enterprises required little assistance, the cost per kilogram of HFC phased out is high. The remaining enterprises are following a global trend in the conversion of stand-alone commercial refrigeration equipment to R-290 (and, to a more limited extent, CO₂). The forthcoming ban on the import and manufacture of HFC-based stand-alone commercial refrigeration equipment will support the sustainability of the conversion.

86. Conversely, the Secretariat acknowledges that there are risks associated to the sustainability of the phase-down to be achieved in the local assembly and installation subsector. In the last several years, the Government has engaged supermarkets to develop the national strategy to reduce supermarkets' HFC consumption and reduce their energy consumption; that engagement helps ensure the sustained buy-in from end-users to transition to energy efficient, low-GWP technology. The Secretariat further considers that the planned technical assistance will strengthen the capability of the subsector to assemble and install low-GWP and energy efficient refrigeration systems. The assistance to the enterprises to develop and install low-GWP prototype systems will help build confidence in the market and enable the acceptance of those systems. The monitoring of the performance of the systems, including the savings accrued from the improved energy efficiency of installed low-GWP refrigeration systems, which could be complemented by a future project using digital monitoring and management tools, will further enable market acceptance and reduce the risk to the sustainability of the subproject.

Draft Agreement

87. A draft Agreement between the Government of Colombia 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.

88. If the Executive Committee so wishes, the funds for stage I of the KIP for Colombia 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

89. The Executive Committee may wish to consider:

- (a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for Colombia for the period 2024-2029 to reduce HFC consumption by 18.3 per cent of the country's baseline by 2029, in the amount of US \$5,043,086, consisting of US \$4,270,960, plus agency support costs of US \$298,967, for UNDP, US \$368,725, plus agency support costs of US \$47,934, for the Government of Germany, and US \$50,000, plus agency support costs of US \$6,500, for UNEP, as reflected in the schedule contained in annex I to the present document;
- (b) Noting:
 - (i) That the Government of Colombia will establish its starting point for sustained aggregate reductions in HFC consumption based on guidance provided by the Executive Committee;
 - (ii) That, once the cost guidelines for HFC phase-down are agreed by the Executive Committee, reductions from the country's remaining HFC consumption eligible for funding will be determined in line with these guidelines;
 - (iii) That the reductions from the country's remaining HFC consumption eligible for funding referred to in subparagraph (b)(ii) above will be deducted from the starting point referred to in subparagraph (b)(i);
 - (iv) That the level of costs approved for the commercial refrigeration manufacturing sector would not constitute a precedent for future such projects;
 - (v) The commitment of the Government to issue a ban on the import and manufacture of HFC-based stand-alone commercial refrigeration equipment by 1 July 2028 and that the ban would enter into force by 1 July 2029;
 - (vi) That UNDP will include in progress reports submitted under the KIP the names and consumption of enterprises manufacturing HFC-based stand-alone commercial refrigeration equipment beyond the 27 enterprises assisted under the project, and that consumption will be deducted from the country's remaining HFC consumption eligible for funding when stage II of the KIP is submitted;
 - (vii) That UNDP will report on the quantity of HFCs phased out through CO₂-based equipment manufactured by the enterprise Weston upon completion of the project. If Weston phases out less than 5 mt of HFCs through the manufacture of CO₂-based stand-alone refrigeration units, the enterprise will return to the Multilateral Fund through UNDP US \$19.01/kg plus agency support costs for every kilogram not manufactured with CO₂;
 - (viii) That the Fund Secretariat had updated the Agreement between the Government of Colombia and the Executive Committee for stage III of the HCFC phase-out management plan, as contained in annex III to the present document, specifically: Appendix 2-A on the basis of shifting the third tranche of the Agreement to 2027, Appendix 3-A to specify that future tranches would be submitted to the first meeting of the year specified in Appendix 2-A, and paragraph 17 that had been

added to indicate that the updated Agreement supersedes that reached at the 88th meeting by decision 88/57;

- (ix) That upon completion of the end-user projects included in stage I of the KIP, UNDP will submit a final report on the implementation of these projects, including the HFC phase-out and energy-efficiency gains achieved, in line with decision 92/36(g);
- (c) Further noting the strong commitment of the Government of Colombia to support reductions in HFC consumption in advance of the Montreal Protocol targets;
- (d) Approving the first tranche of stage I of the KIP for Colombia, and the corresponding tranche implementation plan, in the amount of US \$3,026,307, consisting of US \$2,554,986, plus agency support costs of US \$178,849, for UNDP, and US \$258,825, plus agency support costs of US \$33,647, for the Government of Germany; and
- (e) Requesting the Government of Colombia, UNDP, the Government of Germany, UNEP and the Secretariat to finalize the draft Agreement between the Government of Colombia 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 has been approved by the Executive Committee.

PILOT PROJECT TO MAINTAIN AND/OR ENHANCE THE ENERGY EFFICIENCY OF REPLACEMENT TECHNOLOGIES AND EQUIPMENT IN THE CONTEXT OF HFC PHASE-DOWN (NON-INVESTMENT ACTIVITIES)

PROJECT DESCRIPTION

Background

90. On behalf of the Government of Colombia, UNDP has submitted, in line with decision 91/65, a request for a pilot project to maintain and/or enhance the energy efficiency of replacement technologies and equipment in the context of HFC phase-down (non-investment activities), in the amount of US \$525,000, plus agency support costs of US \$36,750, as originally submitted.¹⁶

Energy efficiency pilot project

91. Colombia ratified the Kigali Amendment on 25 February 2021 and has implemented a licensing system for controlling and monitoring HFCs in line with the Kigali Amendment requirements. An overview of HFC consumption and related activities can be found in paragraphs 1 to 89 of the present document in the request for stage I of the Kigali HFC implementation plan (KIP) submitted to the present meeting.

Policy, regulatory and institutional framework

92. The Ministry of Mines and Energy is responsible for formulating and adopting the policies and developing the programs for the efficient use of energy and the development of alternative energy sources (PROURE). As a part of this ministry, the Mining and Energy Planning Unit (UPME) is responsible for promoting, designing and establishing plans, programs and projects related to the efficient use, saving and conservation of energy in all fields of economic activity and for carrying out the necessary dissemination work. The Indicative Action Plan (PAI) of PROURE was adopted in 2022 by the Ministry of Mines and Energy, Resolution 40156, and proposes a 2030 vision of energy efficiency as a fundamental resource in achieving reliable supply, competitive prices and climate change mitigation, and determines the sectoral energy savings goals to reduce the technological gap in energy use through the adoption of cost-efficient measures, devices and equipment.

93. The measures studied in the PAI-PROURE show a 10 per cent consumption reduction potential in the 2022-2030 period, distributed across the transportation (3.7 per cent), residential (2.9 per cent), industrial (1.4 per cent), and tertiary (0.7 per cent) sectors and others. With the implementation of measures proposed in this plan, Colombia could save one year of energy consumption and its associated costs. For the residential, industrial and tertiary sectors, the promotion of replacing RAC equipment is fundamental to generate substantial and long-term transformation in energy consumption and can be achieved through the combination of digitalization, carbon pricing and labels, as better-informed customers make better decisions. Furthermore, the PAI-PROURE has established that energy labelling initiatives and minimum energy performance standards (MEPS) for energy end-use equipment, vehicles and buildings should be continued, strengthened and implemented.

94. Colombia currently has a Technical Regulation on Energy Labelling (RETIQ), issued by the Ministry of Mines and Energy on 31 August 2016, that makes labels mandatory and enforceable for domestic refrigeration equipment, air conditioners for enclosures, single-phase and three-phase induction motors, ballasts for fluorescent lighting and clothes washers. The National Quality Subsystem (SICAL) supports the enforcement of RETIQ and includes the Ministries and decentralized Authorities of the national order that issue the technical regulations, the surveillance and control entities, and the laboratories,

¹⁶ As per the letter of 29 July 2024 from the Ministry of the Environment and Sustainable Development of Colombia to UNDP.

certification bodies, and inspection bodies that carry out conformity assessment activities. Manufacturers, importers and sellers of equipment must obtain and have available the product conformity certificate which demonstrates that the product was evaluated and complies with the requirements established in the technical regulation.

95. Although the establishment of energy efficiency indicators for refrigerators and/or freezers for commercial use (also high-power cooking equipment) has been extensively discussed since the issuance of RETIQ in 2015, it continues to be postponed due to the lack of technical and market analysis studies that are required for the establishment of labels and MEPS for commercial refrigerators and freezers.

Project objective

96. The pilot project proposal on energy efficiency seeks to establish a roadmap toward the improvement of energy efficiency labelling schemes and the introduction of MEPS for commercial refrigeration equipment.¹⁷ In order to achieve this, technical and market analysis studies will be undertaken to establish relative savings values and other benchmark energy efficiency indicators, and the national capacity for determining the energy consumption of commercial refrigerators and freezers using the test methods established in current international standards. This is aligned with the long-term KIP strategy to facilitate the adoption of energy-efficient, low-GWP-based technologies in commercial refrigeration applications.

Proposed activities

97. The following activities have been proposed to be implemented within 36 months:

- (a) *Support for the formulation and implementation of energy efficiency labelling measures and MEPS for commercial refrigerators and freezers:* Develop a comprehensive understanding of energy efficiency labelling systems and MEPS by gathering information from other countries on these standards for commercial refrigerators and freezers; conducting surveys, online consultations, and meetings with stakeholders from Government agencies, local manufacturers, importers, distributors and consumers; conducting technical assistance workshops, training, and meetings for regulatory developments; and coordinating the Ozone Technical Unit (UTO) with relevant energy efficiency authorities and national standards bodies to consider the transition from HFC refrigerants to low-zero GWP substances when developing energy efficiency standards (US \$25,000);
- (b) *Technical and market analysis studies to establish relative savings values and other energy efficiency reference indicators:* Create a directory and connect with manufacturers and importers of commercial refrigerators and freezers; conduct a national technical and market information survey of commercial refrigerators and freezers to analyze the type of equipment manufactured or imported, including equipment capacity, energy consumption, energy efficiency rating (when applicable) and refrigerant type and charge; conduct an estimated 140 energy consumption tests for a sample of equipment available in the market across 40 enterprises that import and/or manufacture commercial refrigerators and freezers (five models for medium-sized enterprises, three for small enterprises and two for micro enterprises) to calculate energy efficiency indexes to establish a baseline to define the energy classification proposal and the development of MEPS; advance the comparative evaluation of the energy efficiency levels found in the national market with the regional

¹⁷ Includes both forced air circulation and cold plate versions of vertical coolers, horizontal coolers, and upright freezers with glass door; solid door and glass door horizontal freezers; both average and low temperature closed display cases; mixed chiller and freezer; and mixed showcase.

and international market trends; prepare a report on the estimated impact of the energy labelling, classification regulation and the MEPS on the market; and conduct workshops to present and analyze the results of the studies with all stakeholders (US \$215,000);

- (c) *Establish a roadmap for the study, formulation and implementation of energy efficiency labelling and MEPS measures for commercial refrigerators and freezers:* Analyze and prepare a report on regulatory gaps for the implementation of energy efficiency labelling and the establishment of MEPS for commercial refrigerators and freezers; prepare a roadmap in consultation with the enterprises and authorities responsible for energy efficiency issues in the RAC sector (UPME, Ministry of Mines and Energy, Ministry of Environment and Sustainable Development); support the development of MEPS and preliminary outreach, awareness and capacity-building initiatives for its implementation; provide technical assistance to manufacturers and importers through information exchange workshops on technologies that promote energy efficiency and raise awareness of the energy efficiency labelling standard to be established; and update the training of teachers and training programs in the RAC sector with respect to energy efficiency labelling and MEPS standards (US \$160,000); and
- (d) *Update national capacity for determining energy consumption using test methods established in current international standards:* Assess the capacity of the current testing laboratories in the country and identify improvements required to enable them to perform energy consumption tests and energy efficiency calculations; define the requirements for laboratory updates including test methods, software, physical and equipment infrastructure, training and information exchange with international laboratories; propose the acquisition and installation of safety systems in laboratories, especially for self-contained commercial refrigeration equipment with flammable refrigerants; provide training on test methods and access to software used to determine and analyze energy consumption and energy efficiency index of refrigerators and freezers for commercial use, based on international standards;¹⁸ and support the accreditation of at least two laboratories for energy consumption testing for commercial refrigerators and freezers (US \$125,000).

Total cost of the pilot project

98. The total cost of the project to maintain and/or enhance the energy efficiency of replacement technologies and equipment in the context of HFC phase-down amounts to US \$525,000, plus agency support costs, and will be implemented between January 2025 and December 2027.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

Comments

99. The Secretariat has reviewed the project proposal in light of the activities described under decisions 89/6 and 91/65.

100. In line with decision 91/65, confirmation has been obtained from the Government of Colombia that the UTO will coordinate with relevant energy-efficiency authorities and national standards bodies to facilitate the consideration of refrigerant transition when developing energy efficiency standards in the

¹⁸ International standards include ISO 23953-2:2023: Refrigerated display cabinets - Part 2: Classification, requirements and test conditions; the Colombian Technical Standard NTC 5310: 2021: Energy Efficiency in commercial refrigeration equipment, efficiency ranges and labelling; the Mexican Official Standard - NOM-022-ENER-SCFI-2014: Energy efficiency, user safety requirements for self-contained commercial refrigeration appliances. Limits, test methods and labelling; and ANSI/ASHRAE 72-2022: Testing Refrigerators and Freezers.

relevant sectors/applications; that, if Colombia has mobilized or were to mobilize funding from sources other than the Multilateral Fund for energy-efficiency components when phasing down HFCs, the project will not result in the duplication of activities among those funded by the Multilateral Fund and those funded from other sources; that information on project progress, results and key learning will be made available, as appropriate; and that the date of completion of the project will be set as no more than 36 months after the date of approval by the Executive Committee and that a detailed project report will be submitted to the Executive Committee within six months of the date of completion of the project.

Policy, regulatory and institutional framework

101. Regarding the status of MEPS in the country, UNDP confirmed that MEPS for domestic refrigerators had been developed under the country's nationally appropriate mitigation actions (NAMA); those MEPS had entered into force in September 2023. In addition, country was in the process of developing MEPS for residential AC. That process is ongoing and, while an exact timeline for the finalization of MEPS for residential AC is not yet available, UNDP expects that the MEPS for residential ACs would be finalized before that of commercial refrigeration equipment given the activities (e.g., market studies and analyses) are already in the process of being undertaken. The country chose to focus the present project on commercial refrigeration equipment in line with the HFC phase-down activities being undertaken in the KIP.

102. An outcome of the project will be a roadmap for the development of MEPS for stand-alone commercial refrigeration. The Secretariat and UNDP discussed whether the timeline for the adoption of MEPS could be accelerated. In that context, the Secretariat noted that the U4E model regulations for commercial refrigeration equipment¹⁹ could provide useful information to help guide the MEPS development process.

103. UNDP clarified, and the Secretariat agrees, that while U4E's model regulations will provide a useful reference, the planned technical assistance activities will be important to ensuring that the MEPS that will be proposed are at an appropriate level for the country, including the survey of commercial refrigerators and freezers being imported and manufactured in the country, the consumption tests of a sample of equipment available in the country, and other activities. Accordingly, it is unlikely the country would be able to finalize the implementation of MEPS for stand-alone commercial refrigeration equipment by the date of completion of the project. Regarding the scope of equipment that would be covered by the MEPS, that scope is specified in resolution 41012 of 2015 (RETIQ), which may differ from that covered by the U4E model regulations.²⁰

Technical and cost-related issues

104. The Secretariat sought to better understand the need to assess and strengthen the national testing laboratory infrastructure given that MEPS were already in force in the country and, therefore, the country already would have some infrastructure to test the equipment subject to MEPS (i.e., domestic refrigerators), and that would soon to be subject to MEPS (i.e., residential air-conditioning units). UNDP clarified that in order to test RAC and other equipment for energy efficiency, laboratories would need to be accredited by the National Accreditation Body of Colombia (ONAC). To date, there are thirteen accredited laboratories, of which six are accredited for energy consumption tests of domestic refrigerators. The wait times to test equipment at the laboratories is long, which means manufacturers and importers have to wait to certify that their equipment meets the relevant MEPS. That limited capacity, and the expected increased demand for

¹⁹ https://united4efficiency.org/wp-content/uploads/2021/11/U4E_CommercialRefrig_ModelRegulation_20230728_EN.pdf

²⁰ The U4E model regulations cover the refrigerated display (freezer or refrigerator) cabinets, refrigerated storage (freezer or refrigerator) cabinets, refrigerated drink cabinets or beverage coolers, ice cream freezer cabinets, scooping cabinets, and refrigerated vending machines. Other equipment, such as ice makers, cabinets designed for both food processing and storage, refrigerating equipment for the storage of medicines or scientific samples, wine storage appliances and minibars, and certain other equipment are not covered.

testing given the implementation of the project, and the development of the MEPS for residential AC, is the rationale behind strengthening the testing capacity in the country. The Secretariat further notes that some laboratories that may be suitable to test domestic refrigerators, may need some retrofitting to enable them to also test commercial refrigeration equipment, particularly for larger such equipment.

105. UNDP and the Secretariat had detailed discussions on the costs related to the information exchange workshops for manufacturers and importers, and for updating the training curricula of trainers on energy efficiency labelling and MEPS. Regarding the former, it was agreed to hold five three-day workshops (two in Bogota, and one in Cali, Barranquilla and Medellín), with each workshop supported by a local and an international consultant (one expert in equipment design for safety and energy efficiency, and the other on testing and data analysis of energy consumption). A total of 85 engineers from 40 micro-, small-, and medium-sized enterprises manufacturing, importing and distributing stand-alone commercial refrigeration equipment will participate. On that basis the agreed costs for the workshops were reduced from US \$120,000 to US \$106,319. Regarding the latter, given that MEPS would not be finalized by the time the project was completed, it was agreed to reduce the costs of that activity from US \$10,000 to US \$5,000. The costs of the other activities were agreed, as submitted, resulting in agreed costs of US \$506,319, as summarized in table 16 below.

Table 16. Total cost of the energy efficiency pilot project for Colombia as agreed (US \$)

Activities	As submitted	As agreed
Support for the formulation and implementation of energy efficiency labelling and MEPS	25,000	25,000
Technical and market analysis studies to establish savings and other energy efficiency reference indicators	215,000	215,000
Roadmap for energy efficiency labelling and MEPS for stand-alone commercial refrigerators and freezers	160,000	141,319
Strengthening national capacity for testing energy consumption	125,000	125,000
Total	525,000	506,319

106. In line with decision 91/65, the project would be completed no later than December 2027 (i.e., 36 months from the date of approval).

Agreed cost of the pilot project

107. The cost of the project was agreed at US \$506,319, plus agency support costs of US \$35,442 for UNDP.

Sustainability of the pilot project and assessment of risks

108. Ultimately, the implementation and enforcement of MEPS are the most effective mechanisms to ensure the sustainability of energy efficiency gains. The Secretariat considers it unlikely that the country would be able to complete the process to establish MEPS by the time of completion of the project. The development of the roadmap is a realistic target that will enable the country to establish MEPS once the project is completed. The capacity building, including of the testing infrastructure in the country, will help ensure that MEPS are implemented and enforced. The project will foster collaboration between the NOU and relevant energy-efficiency authorities and national standards bodies, which will be of benefit for future efforts in the country related to labelling and MEPS of RAC equipment. In addition, the results of the project will be disseminated in the twinning workshops for ozone officers and energy efficiency officers from Latin America and the Caribbean organized by UNEP, as well as in the thematic meetings of the network of ozone officers from the Latin America and Caribbean region.

Recommendation

109. The Executive Committee may wish to consider approving the pilot project to maintain and/or enhance the energy efficiency of replacement technologies and equipment in the context of HFC phase-down (non-investment activities) for Colombia, in the amount of US \$506,319, plus agency support costs of US \$35,442 for UNDP, noting:

- (a) That the Government of Colombia has committed to the conditions referred to in decision 91/65(b)(iv)b. to (b)(iv)d.; and
- (b) That the project would be operationally completed no later than December 2027, and a detailed project report would be submitted to the Executive Committee within six months of the date of completion of the project.

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 COLOMBIA**

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)	8,652,982	8,652,982	8,652,982	8,652,982	8,652,982	7,787,684	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO ₂ -eq tonnes)	8,652,982	8,652,982	8,652,982	8,652,982	8,652,982	7,068,258	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	2,554,986	0	0	1,715,974	0	0	4,270,960
2.2	Support costs for Lead IA (US \$)	178,849	0	0	120,118	0	0	298,967
2.3	Cooperating IA (Germany) agreed funding (US \$)	258,825	0	0	109,900	0	0	368,725
2.4	Support costs for Cooperating IA (US \$)	33,647	0	0	14,287	0	0	47,934
2.5	Cooperating IA (UNEP) agreed funding (US \$)	0	0	0	50,000	0	0	50,000
2.6	Support costs for Cooperating IA (US \$)	0	0	0	6,500	0	0	6,500
3.1	Total agreed funding (US \$)	2,813,811	0	0	1,875,874	0	0	4,689,685
3.2	Total support costs (US \$)	212,496	0	0	140,905	0	0	353,401
3.3	Total agreed costs (US \$)	3,026,307	0	0	2,016,779	0	0	5,043,086

HCFC phase-out management plan from 2024 to 2030 (stage III)

Row	Particulars	2024	2025	2026	2027	2028	2029	2030	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	146.64	73.32	73.32	73.32	73.32	73.32	0.00	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	30.21	30.21	30.21	30.21	14.19	14.19	0.00	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	0	0	587,083	0	0	207,864	0	794,947
2.2	Support costs for Lead IA (US \$)	0	0	41,096	0	0	14,550	0	55,646
2.3	Cooperating IA (Germany) agreed funding (US \$)	0	0	0	0	0	0	0	0
2.4	Support costs for Cooperating IA (US \$)	0	0	0	0	0	0	0	0
3.1	Total agreed funding (US \$)	0	0	587,083	0	0	207,864	0	794,947
3.2	Total support costs (US \$)	0	0	41,096	0	0	14,550	0	55,646
3.3	Total agreed costs (US \$)	0	0	628,179	0	0	222,414	0	850,593

Annex II

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

Category of activity	HPMP – stage III		KIP – stage I		HPMP+KIP combined cost (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
Policy and regulations	Adjust the resolution that controls HCFC limits; regulatory impact assessment to issue HCFC regulations; training for Government participants on legal measures to control and reduce ODS emissions and consumption; public awareness documents on the HCFC phase-out	70,000	Assessment of current and required HFC import/export regulations, a study on the adoption of technical standards to support energy efficiency and the safe use of flammable, toxic, and high-pressure refrigerants in RAC equipment	54,000	124,000
Manufacturing		-	Phase out HFC consumption in 27 enterprises manufacturing self-contained commercial refrigeration equipment	1,093,513	1,093,513
Assembly and installation		-	TA and equipment support to seven enterprises assembling refrigeration equipment (condensing units and centralized and distributed refrigeration systems for supermarkets) support to reduce their use of HFCs	878,000	878,000
Customs and enforcement training	Monitoring of the HCFC licensing, permits and quotas system, monitoring visits to refrigerant gas trading shops, awareness-raising for HCFC importers and traders, continued participation in the iPIC mechanism; annual training for customs officers on controls of HCFCs and HCFC equipment and penalties; servicing of existing refrigerant identifiers and procurement of three identifiers for HCFCs and HFC blends; and establishment of the ODS Trade Control Inter-Institutional Committee	135,000	Strengthen the capacity of customs and national authorities (provision and training of analytical equipment for customs, develop an HFC import quotas app, analysis of available polyol refrigerants, and coordination of control measures)	191,000	326,000
Technician training	Commercial refrigeration: Establishment of a second natural refrigerants training centre to improve institutional capacities for the training of technicians in the safe use of natural refrigerants in an additional region of the country, including procurement of a CO ₂ /R-290 cascade demonstration unit and servicing tools, and train-the-trainers workshops	395,000	Strengthen the infrastructure of RAC technical training institutions (tools, equipment, and training for the safe handling of HFCs and alternatives; support to SENA)	138,525	533,525
RAC technician certification and tools	Update national standards for labour competence related to the safe use of low-GWP refrigerants; promote labour	591,188	Promote and strengthen training and certification of trainers, assessors, and technical personnel for the management of HFCs and the safe	535,200	1,126,388

	HPMP – stage III		KIP – stage I		HPMP+KIP combined cost (US \$)
Category of activity	Activity	Cost (US \$)	Activity	Cost (US \$)	
	competence certification for RAC; training for assessment and certification leaders; certification of technicians in good refrigeration practices; and procurement of servicing tools for HC-based commercial refrigeration equipment		and sustainable use of low-zero GWP alternatives (develop courses, training on new programme, awareness and partnerships)		
MAC technicians		-	Support good servicing practices in MAC and refrigerated transport (workshops, equipment)	285,225	285,225
RRR network support	Assessment of RRR network; implementation of the business plan to recover, identify, guide, and collect refrigerant gases in three regions, annual workshops with technicians and end-users to promote the services offered by the RRR network; provision of tools to enable the recovery of liquid refrigerants	270,000	Increase capacity of the RRR network related to HFC blends (reclamation machines, workshops, strengthen communication)	352,000	622,000
Technical assistance	TA to phase out HCFC consumption in the cold chain, petrochemical and industrial sectors (assessments, workshops to end users and technicians); to phase out HCFC consumption and improve the energy efficiency of RAC systems in supermarkets (assess barriers to uptake of equipment, study on leak detection, monitoring and outreach); and to the fire protection sector (develop labour competence standards in the fire protection sector, train assessment and certification leaders and technicians on the new labour standards; promotion, awareness-raising, TA and provision of tools for HFCF-123 recovery)	378,480	TA to increase energy efficiency in refrigeration systems and equipment in the food cold chain, health sector, and agro-industrial sector (develop strategies, conduct studies in industrial and commercial refrigeration, dissemination of results)	495,000	873,480
Awareness-raising and education	Implementation of a communication strategy on the HCFC phase-out, including annual newsletters on the relation between the HCFC phase-out and the environment, health, and responsible consumption and production, and on implementation of the HPMP, and one annual awareness-campaign on ozone-layer preservation; outreach and coordination events with stakeholders in the fire-fighting and commercial and industrial RAC sectors to promote responsible consumption and production; and integration of	50,000	Digital awareness campaigns to raise awareness across sectors of the actions and importance of the Montreal Protocol and HFC reduction; and promote low-GWP and energy efficient technologies to sectoral and public end users through digital campaigns, printed media, and impact surveys	50,000	100,000

	HPMP – stage III		KIP – stage I		HPMP+KIP combined cost (US \$)
Category of activity	Activity	Cost (US \$)	Activity	Cost (US \$)	
	ozone-related topics in at least one university through the University Environment Project				
Gender mainstreaming		-	Gender-responsive communication, incorporation of gender mainstreaming, strengthen women's leadership in RAC, prevention of gender-based violence in RAC	200,000	200,000
Project funding guide		-	Provide guidance on national, international, and private funding opportunities for projects in the country that promote the adoption of HFC-free, low-GWP, and energy efficient technologies (reference document and workshops to disseminate the information)	30,000	30,000
Coordination	Coordination, management, and reporting for HPMP	188,967	Coordination, management, and reporting for KIP	387,222	576,189
Total		2,078,635		4,689,685	6,768,320
Percentage of total (%)		31		69	100

Annex III

DRAFT TEXT TO BE INCLUDED IN THE UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF COLOMBIA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE III OF THE HCFC PHASE-OUT MANAGEMENT PLAN

(Relevant changes are in bold font for ease of reference)

17. This updated Agreement supersedes the Agreement reached between the Government of Colombia the Executive Committee at the 88th meeting of the Executive Committee.

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	146.64	146.64	146.64	146.64	73.32	73.32	73.32	73.32	73.32	0	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	78.96	42.91	42.91	30.21	30.21	30.21	30.21	14.19	14.19	0	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	409,000	0	479,688	0	0	0	587,083	0	207,864	0	1,683,635
2.2	Support costs for Lead IA (US \$)	28,630	0	33,578	0	0	0	41,096	0	14,550	0	117,854
2.3	Cooperating IA (Germany) agreed funding (US \$)	0	0	395,000	0	0	0	0	0	0	0	395,000
2.4	Support costs for Cooperating IA (US \$)	0	0	51,350	0	0	0	0	0	0	0	51,350
3.1	Total agreed funding (US \$)	409,000	0	874,688	0	0	0	587,083	0	207,864	0	2,078,635
3.2	Total support costs (US \$)	28,630	0	84,928	0	0	0	41,096	0	14,550	0	169,204
3.3	Total agreed costs (US \$)	437,630	0	959,616	0	0	0	628,179	0	222,414	0	2,247,839
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)											20.85
4.1.2	Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes)											50.24
4.1.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)											0.00
4.2.1	Total phase-out of HCFC-123 agreed to be achieved under this Agreement (ODP tonnes)											2.21
4.2.2	Phase-out of HCFC-123 to be achieved in previously approved projects (ODP tonnes)											0.00
4.2.3	Remaining eligible consumption for HCFC-123 (ODP tonnes)											0.00
4.3.1	Total phase-out of HCFC-124 agreed to be achieved under this Agreement (ODP tonnes)											0.04
4.3.2	Phase-out of HCFC-124 to be achieved in previously approved projects (ODP tonnes)											0.00
4.3.3	Remaining eligible consumption for HCFC-124 (ODP tonnes)											0.00
4.4.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)											0.00
4.4.2	Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes)											151.70
4.4.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)											0.00
4.5.1	Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes)											0.49
4.5.2	Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes)											0.00
4.5.3	Remaining eligible consumption for HCFC-142b (ODP tonnes)											0.00
4.6.1	Total phase-out of HCFC-141b contained in imported pre-blended polyols agreed to be achieved under this Agreement (ODP tonnes)											0.00
4.6.2	Phase-out of HCFC-141b contained in imported pre-blended polyols to be achieved in previously approved projects (ODP tonnes)											111.70
4.6.3	Remaining eligible consumption for HCFC-141b contained in imported pre-blended polyols (ODP tonnes)											0.00

APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the **first** meeting of the year specified in Appendix 2-A.