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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: URUGUAY

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 and UNIDO Individual consideration

Energy efficiency

- Pilot project to maintain and/or enhance the energy efficiency of replacement technologies in the commercial refrigeration and residential air-conditioning sectors 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

Uruguay

PROJECT TITLE				AGENCY					
Kigali HFC implementation plan (stage I)				UNDP (lead), UNIDO					
LATEST ARTICLE 7 DATA (Annex F)				Year: 2023		318.46 mt		696,550 CO ₂ -eq tonnes	
SECTORAL HFC CONSUMPTION DATA (CO ₂ -eq tonnes) AND ACTIVITIES									
	Aerosol	Foam	Fire-fighting	AC and refrigeration				Solvent	Other
				Manufacturing			Servicing		
				Refrigeration	AC	Other			
As submitted (2023)	200	*	6,440		7,150		641,833**		40,927
Latest CP report (2023)***	200	33,729*	6,440		7,150		641,833		40,927
KIP stage I activities as agreed (Y/N)	N	N	N	N	N	N	Y	N	N

* Imported pre-blended polyols in the foam sector. This data was included in the CP data but not in the survey and will be addressed in a future stage of the KIP

** 5,128 CO₂-eq tonnes of HFC-23, R-401A, R-407A, R-508B not included in the survey have been included based on the country program (CP) report

*** The CP data report was revised during review process to align with the survey data

AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING	216.04 mt	500,668 CO ₂ -eq tonnes
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BASELINE CONSUMPTION DATA (CO ₂ -eq tonnes)	2020	2021	2022	Average 2020-2022
HFC annual consumption	613,574	431,118	571,556	538,749
HCFC baseline (65%)				473,682
HFC baseline				1,012,431

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	1,012,431	1,012,431	1,012,431	1,012,431	1,012,431	911,188	n/a
	Maximum allowable	1,012,431	1,012,431	1,012,431	1,012,431	1,012,431	911,188	n/a
	Maximum allowable (%)	100	100	100	100	100	90	n/a
Amounts recommended in principle (US \$)	UNDP	Project costs	126,927	0	0	92,413	0	219,340
		Support costs	16,500	0	0	12,014	0	28,514
	UNIDO	Project costs	49,860	0	0	55,800	0	105,660
		Support costs	6,482	0	0	7,254	0	13,736
	Total project costs		176,787	0	0	148,213	0	325,000
	Total support costs		22,982	0	0	19,268	0	42,250
	Total funds		199,769	0	0	167,481	0	367,250

* Recommended for approval at the present meeting

Reduction from remaining consumption eligible for funding stage I in CO ₂ -eq tonnes	101,243
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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
 - 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 Uruguay, 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 \$367,250, consisting of US \$219,190, plus agency support costs of US \$28,495 for UNDP and US \$105,810, plus agency support costs of US \$13,755 for UNIDO, as originally submitted.²

3. The implementation of stage I of the KIP will assist the Government of Uruguay in meeting the target of 10 per cent reduction from its HFC baseline consumption by 1 January 2029.

4. The first tranche of stage I of the KIP being requested at this meeting amounts to US \$216,759, consisting of US \$141,887, plus agency support costs of US \$18,445 for UNDP and US \$49,935, plus agency support costs of US \$6,492 for UNIDO, as originally submitted, for the period of December 2024 to December 2027.

II. Background

Status of implementation of the HCFC phase-out management plan

5. Table 1 presents information on the HPMP in Uruguay as of November 2024.

Table 1. HPMP implementation status for Uruguay

	Stage I	Stage II	Stage III
Meetings when HPMP was approved/updated	65 th	77 th	86 th /92 nd
Reduction from baseline	10% by 2015	35% by 2020	100% by 2030
Total project cost (US \$)	380,004	1,105,157	1,289,170
Date of completion (actual/planned)	December 2016	December 2022	December 2031

² As per the letter of 14 August 2024 from the Ministry of Environment of Uruguay to the UNDP.

Status of implementation of previous HFC-related activities

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

Table 2. Previously approved HFC-related activities in Uruguay

Approval meeting	Project title	Implementing agency	Cost (US \$)	Date of completion
74 th	Survey of ODS alternatives	UNIDO	110,000	December 2017
80 th	Enabling activities for HFC phase-down	UNDP/UNIDO	150,000	December 2021

III. HFC consumption overview

HFC consumption levels

7. Uruguay imports HFCs for use in the servicing sector, including for the local installation and assembly subsector, and consumes a small amount of HFCs in the firefighting and aerosols sectors, and in the manufacture of metered-dose inhalers (MDIs) and mobile air-conditioning (MAC) units. The most consumed substances in 2023 were HFC-134a (30 per cent of total HFC consumption in CO₂-equivalent (CO₂-eq) tonnes), R-404A (27 per cent), R-410A (24 per cent), R-507A (15 per cent), HFC-32, HFC-227ea, R-407C and other HFCs (at close to 1 per cent each). Table 3 presents the country's HFC consumption as reported to the Ozone Secretariat under Article 7 of the Montreal Protocol. In addition, the country also imports HFCs contained in pre-blended polyols to manufacture polyurethane (PU) foam.

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

HFC	GWP	2019	2020	2021	2022	2023
Metric tonnes (mt)						
HFC-32	675	0.30	0.00	2.95	8.93	8.34
HFC-134a	1,430	87.48	136.98	83.04	142.49	146.86
HFC-227ea	3,220	0.90	0.02	0.01	0.02	2.00
R-404A	3,922	23.32	51.00	29.96	31.93	47.34
R-407C	1,774	5.36	6.93	3.28	7.18	3.79
R-410A	2,088	50.04	45.33	40.57	52.15	81.10
R-507A	3,985	28.84	27.54	25.57	28.70	27.02
Others*		0.65	0.59	0.43	0.48	2.01
Total (mt)		196.89	268.39	185.81	271.88	318.46
CO₂-eq tonnes						
HFC-32	675	203	0	1,991	6,028	5,630
HFC-134a	1,430	125,096	195,881	118,747	203,761	210,010
HFC-227ea	3,220	2,898	64	32	64	6,440
R-404A	3,922	91,452	200,002	117,491	125,217	185,649
R-407C	1,774	9,508	12,293	5,818	12,736	6,723
R-410A	2,088	104,459	94,626	84,690	108,863	169,296
R-507A	3,985	114,927	109,747	101,896	114,370	107,675
Others*		121	960	451	518	5,128
Total (CO₂-eq tonnes)		448,663	613,574	431,118	571,556	696,550

* Including HFC-152, HFC-152a, HFC-23, R-401A, R-407A, R-417A, R-422B, R-437A, R-449A, R-508B, R-513A

Established HFC baseline

8. The Government of Uruguay reported the Article 7 data for 2020-2022. The country's HFC consumption baseline was established at 1,012,431 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 Uruguay (CO₂-eq tonnes)

Baseline calculation components	2020	2021	2022
HFC annual consumption	613,574	431,118	571,556
HFC average consumption in 2020-2022	538,749		
HCFC baseline (65%)	473,682		
HFC baseline	1,012,431		

Country programme implementation report

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

HFC consumption trends

10. Except for in 2021, when HFC consumption fell due to the impact of the COVID-19 pandemic, consumption in the country has been increasing due to, inter alia, population growth; economic activity; limited availability or accessibility of low-global-warming-potential (GWP) technologies; commercial promotion by suppliers of high-GWP technologies and consumer confidence in those technologies; and the phase-in of HFCs from the phase-out of CFCs and HCFCs. While Uruguay was a non-low-volume-consuming (LVC) country for HCFCs, its HFC consumption in the servicing sector is below 360 mt and, therefore, it is considered an LVC country for HFCs.

HFC consumption by sector

11. HFCs are consumed in the servicing sector (88.8 per cent in mt) with the remaining consumption in the MDI and MAC manufacturing, firefighting and aerosol sectors. In the servicing sector, HFCs are mainly used to service commercial refrigeration equipment (including centralized systems) (31.5 per cent), residential air-conditioning (AC) (24.6 per cent), MAC (13.5 per cent), and other subsectors as shown in tables 5 and 6 below. The local assembly and installation subsector, not shown in the table below, is estimated to account for approximately 29.7 per cent of the country's HFC consumption.

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

Sector	HFC-32	HFC-134a	HFC-227ea	R-404A	R-410A	R-507A	Other**	Total	Share of total (%)
Manufacturing									
MAC	0.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	1.6
MDI	0.00	28.62	0.00	0.00	0.00	0.00	0.00	28.62	9.0
Subtotal manufacturing	0.00	33.62	0.00	0.00	0.00	0.00	0.00	33.62	10.5
Refrigeration and AC servicing									
Refrigeration subsectors									
Domestic	0.00	15.60	0.00	0.00	0.00	0.00	0.00	15.60	4.9
Commercial	0.00	22.01	0.00	0.00	0.00	0.00	1.49	23.50	7.4
Centralized systems	0.00	12.38	0.00	36.18	0.00	27.02	1.70	77.28	24.2
AC subsectors									
Transport	0.00	20.06	0.00	11.16	0.00	0.00	0.00	31.22	9.8
Residential	7.63	0.00	0.00	0.00	71.14	0.00	0.00	78.77	24.6
Commercial	0.71	0.00	0.00	0.00	9.96	0.00	3.79	14.46	4.5
Mobile	0.00	43.05	0.00	0.00	0.00	0.00	0.00	43.05	13.5
Subtotal servicing***	8.34	113.10	0.00	47.34	81.10	27.02	6.98	283.88	88.8

Sector	HFC-32	HFC-134a	HFC-227ea	R-404A	R-410A	R-507A	Other**	Total	Share of total (%)
Other sectors									
Aerosol	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.14	0.0
Firefighting	0.00	0.00	2.00	0.00	0.00	0.00	0.00	2.00	0.6
Subtotal other	0.00	0.14	2.00	0.00	0.00	0.00	0.00	2.14	0.7
Total	8.34	146.86	2.00	47.34	81.10	27.02	6.98	319.64	100

* The table excludes consumption in HFCs contained in imported pre-blended polyols of 34.4 mt.

** Includes HFC-23 (0.08 mt), R-401A (1.36 mt), R-407A (1.70 mt), R-407C (3.79 mt) and R-508B (0.05 mt).

*** Includes consumption of HFCs in the local installation and assembly subsector, estimated at 94.78 mt.

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

Sector	HFC-32	HFC-134a	HFC-227ea	R-404A	R-410A	R-507A	Other**	Total	Share of total (%)
Manufacturing									
Mobile AC	0	7,150	0	0	0	0	0	7,150	1.0
MDI	0	40,927	0	0	0	0	0	40,927	5.9
Subtotal manufacturing	0	48,077	0	0	0	0	0	48,077	6.9
Refrigeration and AC servicing									
Refrigeration subsectors									
Domestic	0	22,308	0	0	0	0	0	22,308	3.2
Commercial	0	31,474	0	0	0	0	1,546	33,020	4.7
Centralized systems	0	17,703	0	141,883	0	107,675	3,582	270,844	38.9
AC subsector									
Transport	0	28,686	0	43,765	0	0	0	72,451	10.4
Residential	5,150	0	0	0	148,505	0	0	153,655	22.1
Commercial	479	0	0	0	20,792	0	6,723	27,994	4.0
Mobile	0	61,562	0	0	0	0	0	61,562	8.8
Subtotal servicing***	5,630	161,733	0	185,649	169,296	107,675	11,851	641,833	92.1
Other sectors									
Aerosol	0	200	0	0	0	0	0	200	0.0
Firefighting	0	0	6,440	0	0	0	0	6,440	0.9
Subtotal other	0	200	6,440	0	0	0	0	6,640	1.0
Total	5,630	210,010	6,440	185,649	169,296	107,675	11,851	696,550	100

* Table excludes consumption in HFCs contained in imported pre-blended polyols of 33,729 CO₂-eq tonnes

** Includes HFC-23 (1,184 CO₂-eq tonnes), R-401A (22 CO₂-eq tonnes), R-407A (3,582 CO₂-eq tonnes), R-407C (6,723 CO₂-eq tonnes) and R-508B (340 CO₂-eq tonnes).

*** Includes consumption of HFCs in the local installation and assembly subsector, estimated at 275,983 CO₂-eq tonnes.

Manufacturing sectors

12. While vehicles in Uruguay are imported, one automobile manufacturing enterprise that exports vehicles to the region consumes HFC-134a to manufacture MAC units. The 2020-2022 average HFC-134a consumption of the enterprise was 4.59 mt. The uptake of HFO-1234yf in the local market is insignificant. HFC-134a is also used by one enterprise to manufacture MDIs and the 2020-2022 average consumption of that enterprise was 21.84.mt.

13. HFCs contained in imported pre-blended polyols are used in the manufacture of PU foam and this consumption will be addressed under stage II of the KIP. Table 7 shows the consumption of controlled substances contained in imported pre-blended polyols in the country. Imports of HCFC-141b contained in imported pre-blended polyols were phased out under stage II of the HPMP, with a ban on their import as of 1 January 2024.

Table 7. Imports of controlled substances contained in imported pre-blended polyols

Substance	2019	2020	2021	2022	2023
HFC-245fa in imported pre-blended polyol	0.41	0.00	3.31	9.31	9.00
HFC-365mfc in imported pre-blended polyol	18.38	13.28	24.70	1.07	0.13
HFC-227ea in imported pre-blended polyol	0.00	0.00	0.00	0.16	0.00
HFC-365mfc/HFC-227ea in imported pre-blended polyol	0.00	0.00	0.00	18.68	25.27
Total HFCs contained in imported pre-blended polyols	18.78	13.28	28.01	29.22	34.40
HCFC-141b in imported pre-blended polyol	51.47	46.07	33.19	31.77	40.47
Total HCFC-141b in imported pre-blended polyol	51.47	46.07	33.19	31.77	40.47

Refrigeration and air-conditioning servicing sector

14. In Uruguay, there are approximately 1,400 refrigeration and air-conditioning (RAC) technicians, of which approximately 1,200 technicians are registered by the national ozone unit (NOU) and have received some training in good practices for RAC servicing. It is estimated that there are 500 small, medium, and large enterprises where basic maintenance of MAC could be conducted and more than 3,500 “micro” enterprises. Excluding micro-enterprises, roughly 1,500 to 2,000 technicians are estimated to be working in the MAC servicing sector.

Domestic, commercial, industrial and transport refrigeration servicing

15. Domestic refrigeration equipment was dominated by HFC-134a-based units but is slowly being replaced by R-600a-based refrigerators. HFC-134a-based refrigerators account for approximately 60 per cent of units in the country. The 2023 consumption of HFC-134a in the sector accounted for 3.2 per cent of the total HFC consumption in CO₂-eq tonnes (4.9 per cent in mt). Despite the increased availability of R-600a-based domestic refrigeration equipment, HFC-134a still dominates the servicing needs in the sector.

16. The commercial refrigeration subsector (including centralized systems) is the largest consumer of HFCs in terms of CO₂-eq tonnes (43.6 per cent) and in mt (31.5 per cent) and primarily uses R-404A (46.7 per cent of the subsector in CO₂-eq tonnes), R-507A (35.4 per cent) and HFC-134a (16.2 per cent), as well as small quantities of other HFC blends. This subsector includes standalone, condensing and centralized units. HFC-based industrial refrigeration, mainly focused on food management, is considered part of centralized systems due to the small installation size of such systems; large installations, like meat processing facilities, are not based on HFCs but are instead ammonia-based.

17. The transport refrigeration sector accounts for 10.4 per cent of total consumption in CO₂-eq tonnes. The main refrigerants used are HFC-134a and R-404A. The refrigerated transport sector meets the needs of the cold chain for local and export markets, mainly refrigerated foodstuffs.

Residential and commercial air-conditioning servicing

18. The residential AC servicing sector is the second largest HFC consuming subsector with 22.1 per cent of the total HFC consumption in CO₂-eq tonnes (24.6 per cent in mt). R-410A dominates this subsector, accounting for 96.6 per cent of the subsector consumption in CO₂-eq tonnes and the remaining 3.4 per cent is HFC-32-based. Servicing of commercial AC equipment accounts for 4.0 per cent of the country’s HFC consumption in CO₂-eq tonnes, and consists primarily of R-410A, and to a lesser extent R-407C and HFC-32.

Mobile air-conditioning servicing

19. The MAC sector is the fourth largest subsector in terms of HFC consumption in CO₂-eq tonnes, accounting for 8.8 per cent of HFC consumption in CO₂-eq tonnes (13.5 per cent in mt). About 90 per cent of motor vehicles in Uruguay use HFC-134a-based air conditioning. A small percentage use HFO-1234yf, which is found only in new high-end vehicles.

Local installation and assembly subsector

20. There is a significant local installation and assembly sector in Uruguay, which is estimated to be 29.7 per cent of total HFC consumption in mt (40 per cent of total consumption in CO₂-eq-tonnes). R-404A, R-410A, R-507B, HFC-134a, and small quantities of other HFC blends are used in the subsector. The subsector mainly includes residential AC and commercial refrigeration.³

Aerosols

21. Small quantities of aerosols for technical or industrial uses, known as “dusters” and “cleaners” are manufactured in Uruguay. The consumption for this use in 2023 was 0.14 mt of HFC-134a.

Firefighting

22. No manufacturers of fire extinguishers have been identified in Uruguay. Fire firefighting equipment is either based on non-HFC alternatives or imported into the country. HFC-227ea is exclusively used to service existing firefighting equipment and accounted for less than 1 per cent of the total HFC consumption in Uruguay in 2023.

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

Institutional, policy and regulatory framework

23. The Government of Uruguay established a licensing system for the import of HFCs, as well as equipment containing or using them, which has been in place since 1 January 2019 under the authority of the Ministry of Environment. A quota system for HFCs was implemented in 2024 and is administered by the NOU. The quotas are set according to the maximum allowable consumption minus a 10 per cent buffer to account for unforeseen circumstances. Annual initial quotas are allocated based on the importer's prior year's imports. Importers may apply for an additional quota during the year, which is evaluated based on the remaining amount for the year within the maximum national quota. The NOU tracks and sets a limit for HFC imports in CO₂-eq tonnes, but issues quotas to importers in mt and these are registered in mt in Customs. Importers may substitute HFCs depending on their requirements but may not exceed their CO₂-eq tonne limit. Unused quotas can be transferred between importers with prior approval from the NOU. To ensure an operational system, the NOU works jointly with the National Customs Directorate, including the Risk and Inspection Department.

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

Overarching strategy

24. The primary focus of the strategy, as submitted, is to achieve the 2024 freeze and the 10 per cent reduction step by 2029. Uruguay's KIP will focus on reducing demand for HFCs, strengthening institutions involved in ensuring compliance with the Kigali Amendment, ensuring appropriate use of HFC-based equipment to reduce consumption, ensuring the uptake and safe use of alternatives to HFCs, and monitoring.

Proposed reductions

25. The Government of Uruguay and UNDP forecasted consumption in a business-as-usual-scenario (BAU). The BAU scenario projects an annual growth of roughly 6 per cent that gradually increases to 6.8 per cent by 2029. The projection takes into consideration the consumption of each substance based on

³ Consumption of HFCs in the local assembly and installation subsector is further discussed in paragraphs 35-37 of the present document.

their primary uses, population and economic growth, current and future HCFC phase-out measures, and alternatives to HFCs being phased in independently of the Kigali Amendment. In this BAU scenario, the growth of HFC consumption is expected to exceed the control level by 2029, as shown in table 8.

Table 8. HFC consumption forecast under unconstrained scenario, Montreal Protocol limits and proposed HFC reductions under stage I (CO₂-eq tonnes)

Scenario	2023*	2024	2025	2026	2027	2028	2029
HFC consumption forecast (annual growth rate between 5.9 to 6.8 per cent)	696,550	737,411	785,169	836,535	891,831	951,418	1,015,692
Montreal Protocol HFC consumption limits	n/a	1,012,431	1,012,431	1,012,431	1,012,431	1,012,431	911,188
Proposed HFC consumption under the KIP	n/a	1,012,431	1,012,431	1,012,431	1,012,431	1,012,431	911,188
Proposed reduction in HFC consumption from baseline (%)	n/a	0	0	0	0	0	10

* As per Article 7 data.

Proposed activities

26. Stage I of the KIP includes activities implemented under four main components: strengthening the regulatory framework, enforcement and control of HFC imports; specialized training for RAC servicing; training programme in MAC servicing; and awareness-raising to promote new, energy-efficient, and low-GWP technologies. The costs and activities are described below, as originally submitted:

Table 9. Activities to be implemented in stage I of the KIP in Uruguay

Project component	Targets	Agency	Cost for stage (US \$)
Project to strengthen HFC regulatory framework enforcement and control	- Review and update existing regulatory framework to adjust import quotas and other measures - Conduct meetings/outreach on potential regulatory adjustments - Conduct at least two update meetings with stakeholders from institutions and associations on legal measures to control and reduce HFC emissions and consumption - Preparation of new sectoral energy efficiency-related and/or other regulations for the import and installation of new refrigeration and AC systems	UNIDO	35,000
	Customs/importer training programme: - Two training courses to update a total of 40 border control officers on the regulations for the control of HFCs - Design a border control handbook to assist customs officers - Two training workshops for a total of 40 brokers and importers on HFC-related policies and regulations	UNIDO	38,400
RAC technician training project	Training on low-charge domestic and commercial standalone refrigerators: - Procurement of RAC equipment for training centres including at least: - Two R-600a domestic refrigeration training units - Two R-290 medium-temperature commercial refrigeration units - Four training workshops for 80 RAC technicians	UNIDO	22,660
	Training on large-charge domestic AC, commercial installations and commercial CO ₂ -based equipment:	UNDP	106,720

Project component	Targets	Agency	Cost for stage (US \$)
	• Procurement of RAC equipment for training centres including at least: ○ Two R-290 AC training units ○ Two R-290 low-temperature commercial refrigeration units ○ One basic CO₂ demonstration system • Equipment delivery and a national consultant to coordinate installation and start-up of procured equipment • Eleven training workshops for 220 RAC technicians • Expert to update curriculum for training courses • Development of an electronic registry for trained technicians		
Training programme in MAC	Good practices in servicing of MAC equipment: • Identify and register MAC servicing workshops • Develop training materials • Nine training courses for 180 MAC technicians • Three recovery and recycling (R&R) machines⁴ for the technical laboratory of Uruguay (LATU) and other training centres	UNDP	62,720
Awareness-raising for end users to promote energy-efficient, and low-GWP technology	Design specific campaigns for differentiated audiences: • Three information workshops on the control of HFC gases in different applications and promote the advantages of new technology • Development of a national register of large and medium-sized HFC end-users in the RAC subsectors	UNDP	27,000

Project implementation, coordination and monitoring

27. The NOU will be responsible for the overall administration of the KIP implementation and monitoring. A budget of US \$32,500 is proposed for this purpose (US \$22,750 for UNDP and US \$9,750 for UNIDO) for the recruitment of national consultants and for domestic travel.

Gender policy implementation

28. In line with decisions 84/92(d), 90/48(c) and 92/40(b), gender mainstreaming and related indicators have been considered in the development of this project and will be considered throughout its implementation. The Government of Uruguay plans to promote a program to support the inclusion of women and vulnerable groups in the RAC sector. The Ministry of Environment will conduct a study on gender equality in the RAC sector, identify structural barriers to the participation of women, and develop a gender action plan. A gender specialist will assist the NOU in designing the gender action plan. The KIP implementation will include gender mainstreaming in hiring practices for staff and consultants, promote the participation of women in training and workshops, and monitor progress through a number of indicators, including the mandatory indicators under decision 92/40(b).

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

29. Stage III of the HPMP is expected to be completed in 2031. Accordingly, the HPMP and stage I of the KIP will be jointly implemented between 2024 and 2030.

⁴ Unitary HFC-134a and HFO-1234yf machines for R&R with dual cylinder, integrated compressor, electronic scale, filter and recovery tank.

30. Stage III of the HPMP includes the development of a certification programme for RAC servicing technicians, training for technicians on the safe use of ammonia and flammable refrigerants, inverter technology, and R&R of refrigerants; the development and integration of standards for the use of flammable refrigerants in servicing and assembly; the provision of R&R tools and equipment to RAC associations; the provision of tools and equipment to enhance the laboratory capacity of the existing training institute; and the establishment of a second technical laboratory in a training institution. Annex II provides an overview of activities under stage III of the HPMP and stage I of the KIP (2024-2031), showing that activities planned under the KIP either avoid duplication of planned activities under the HPMP or add a new element or focus to complement the HPMP activities.

Total cost of stage I of the Kigali HFC implementation plan

31. The budget for stage I has been proposed at US \$325,000. The costs of activities in the refrigeration servicing sector have been proposed in line with decision 92/37.

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

32. The first funding tranche of stage I of the KIP, in the total amount of US \$191,822, will be implemented between December 2024 and December 2027 and will include the following activities:

- (a) Strengthening the HFC regulatory framework enforcement and control (UNIDO):
 - (i) Adjust the resolution that controls HFC quotas in line with the Montreal Protocol control schedule; complete the regulatory impact assessment to issue HFC regulations; and conduct one meeting with stakeholders from institutions and associations on legal measures to control and reduce HFC emissions and consumption (US \$15,000);
 - (ii) Conduct one training course for customs and stakeholders on the regulations for the control of HFCs and one training workshop for a total of 20 brokers and importers on HFC-related policies and regulations; and review and improve procedures for the quota and licensing system (US \$19,400);
- (b) RAC technician training project (UNDP/UNIDO): Procurement of two R-600a domestic refrigeration training units and two R-290 medium-temperature commercial refrigeration training units (UNIDO) (US \$10,660); procurement of two R-290 AC training units; two R-290 low-temperature commercial refrigeration units, and one basic CO₂ demonstration system; equipment delivery and a national consultant to coordinate installation and start-up of procured equipment; expert to update training courses and six training workshops for RAC technicians; and development of an electronic registry for trained technicians (UNDP) (US \$84,380);
- (c) Training programme in MAC servicing (UNDP): identify and register 120 high-volume MAC servicing workshops; develop training materials; conduct three training courses for 60 MAC technicians; acquisition and distribution of three R&R machines to the LATU and other training centres (US \$37,632);
- (d) Awareness-raising for end users to promote energy-efficient and low-GWP technology (UNDP): one information workshop on the control of HFCs in different applications and promote the advantages of new technology; development of a national register of large and medium-sized HFC end users in the RAC sectors (US \$8,500); and

- (e) Project monitoring and coordination (UNDP/UNIDO): Preparation of implementation and annual reports, monitoring to ensure independent verification of project progress and the achievement of project objectives including US \$11,375 for UNDP and US \$4,875 for UNIDO for the recruitment of national consultants and domestic travel.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

V. Comments

Overarching strategy

HFC reduction targets

33. While the 2029 target is a 10 per cent reduction from the country's established HFC baseline for compliance, it would represent a 31 per cent growth relative to the country's 2023 consumption. Accordingly, the Secretariat enquired whether the country had considered a lower target. UNDP clarified that the Government had chosen not to pursue a lower target, noting, inter alia, that the HFC consumption in Uruguay was growing at a rate higher than economic activity and population growth, indicating an increasing demand for RAC equipment based on HFCs, which are currently more affordable and readily available in the country. UNDP also emphasized the importance of the HCFC component of the baseline that reflected the fact that in the absence of interventions, the phase-out of HCFCs was expected to increase HFC consumption.

34. The Secretariat is not certain that the growth projected under the BAU scenario presented by UNDP is the most realistic representation of future HFC growth in the country. The implementation of activities under the KIP, complemented by the pilot project on energy efficiency proposed in the present document, and the uptake of lower-GWP alternatives in some sectors (e.g., R-600a and R-290 in domestic and standalone commercial refrigeration, and lower-GWP alternatives in residential AC), suggest that lower targets might reasonably be achieved. Conversely, the Secretariat notes that the country's average HFC consumption in the servicing sector in the baseline years is substantially below the country's HCFC consumption in servicing in 2009 and 2010, notwithstanding the growth that would be expected over the more than a decade in the use of refrigerants. Moreover, HFCs are consumed in an additional subsector (i.e., MAC), suggesting that a prudent approach would be to retain the 2029 target proposed by the country.

HFC consumption

35. The Secretariat sought to clarify the extent of HFC-based RAC manufacturing in the country as the CP reports originally submitted by the country indicated substantial manufacturing consumption (an average for 2020-2022 of 79.79 mt, or 231,557 CO₂-eq tonnes) and a correspondingly lower consumption in the servicing sector (an average for 2020-2022 of 140.85 mt, or 275,700 CO₂-eq tonnes), and whether some of the consumption that was reported as RAC manufacturing might more appropriately be considered part of the local assembly and installation subsector, noting that such consumption was not included in the submission. UNDP clarified that the current CP format does not provide a column for consumption in the local assembly and installation subsector and; therefore, the country had reported such consumption as RAC manufacturing consumption, with a note in the remarks column explaining that it corresponded to the local assembly and installation subsector; and that this consumption had not been included in the submission as the country was not yet in a position to submit a project to address the subsector as more assessment was needed to better understand the consumption, and that the lack of clear funding guidance from the Executive Committee for this subsector was a deterrent.

36. Subsequently, the country resubmitted revised CP data reports that included the estimated consumption in the local assembly and installation subsector as part of the servicing sector, with a note in the remarks column specifying the estimated quantity of HFCs used in the subsector and removing that

consumption from the RAC manufacturing sector. Therefore, the only consumption in the RAC manufacturing sector is at an automobile manufacturer that uses a small quantity of HFC-134a in its manufacture of MAC units.

37. The Secretariat notes with appreciation that Uruguay has made significant efforts to clarify the consumption in its CP data reporting and is cognizant of the challenges faced by Article 5 countries in better understanding and reporting consumption in the local assembly and installation subsector. The Secretariat further notes that there may be a lack of clarity regarding what should appropriately be included in the subsector. For example, while the HFC-134a, R-404A, and R-507A used to assemble and install commercial refrigeration systems (mostly cold rooms), clearly appear to be part of the subsector, the country also included the use of R-410A in residential AC installation, as well as some use of R-407A and R-407C in AC installation (mostly residential) in the subsector. According to the definition in the paper prepared by the Secretariat (document UNEP/OzL.Pro/ExCom/92/49), equipment that is installed on site for the end user is not considered as part of the subsector if it is charged in the factory. UNDP noted that the quantities of HFCs used in the subsector were still being evaluated given that it was difficult to differentiate between servicing and assembly for some uses, and that this lack of clarity, and lack of funding guidelines, may hinder the timely submission of projects in the subsector.

38. Regarding certain HFCs that had not been included in the survey undertaken during the preparation of the KIP, UNDP clarified that small quantities of HFC-23 and R-508B are used to service low-temperature refrigeration systems in hospitals for vaccine storage; and small quantities of R-401A are used as a drop-in to service CFC-12-based equipment still existing in the country.

Manufacturing sectors

39. The country did not propose to phase out the use of HFCs contained in imported pre-blended polyols under stage I of the KIP. The Secretariat recalled the challenges faced by foam manufacturing enterprises under the HPMP to convert from HCFC-141b contained in imported pre-blended polyols to pre-blended HFO systems,⁵ and noted with appreciation the continued efforts by the industry, UNDP and the Government to ensure that the enterprises remaining in the HPMP could successfully convert to HFOs. The Secretariat recommends that the Executive Committee allow the Government to submit a project to phase-out HFCs contained in imported pre-blended polyols in the PU foam sector subject to the decision taken by the Executive Committee on whether it would fund the phase-out of HFCs contained in imported pre-blended polyols.⁶

40. In addition to the PU foam manufacturing sector, two sectors consume HFCs for manufacturing: one enterprise manufactures HFC-134a-based MACs used in cars that are exported to the region, and one enterprise manufactures HFC-134a-based MDIs. The country decided not to include a project to phase-out HFC consumption in the MAC sector given the price of alternatives and the conditions necessary to ensure the sustainability of a transition are not yet in place. The country expects to consider phasing out consumption of HFCs in the MDI sector in a last the stage of the implementation of the Kigali Amendment.

Institutional, policy and regulatory framework

HFC licensing and quota system

41. In line with decision 87/50(g), UNDP has confirmed that Uruguay has an established and enforceable system of licensing and quotas for monitoring HFC imports/exports in place.

⁵ Paragraphs 78-91 of document UNEP/OzL.Pro/ExCom/94/9.

⁶ The Executive Committee is considering the issue of HFCs contained in imported pre-blended polyols in the polyurethane foam sector in Article 5 countries at the present meeting under agenda item 11(c).

Regulatory framework

42. Noting the prevalence in the market of R-600a-based domestic refrigerators and R-290-based standalone commercial refrigeration equipment, the Secretariat inquired whether the country had considered to ban HFC-based domestic refrigerators and standalone commercial refrigeration equipment. UNDP confirmed that the country would ban the import and manufacture of HFC-based domestic refrigerators by 1 July 2027 and of HFC-based standalone commercial refrigeration equipment by 1 January 2029. A longer timeline is needed for standalone commercial refrigeration equipment given the need for analyses to define equipment types and customs codes, and to harmonize the timeline with that of neighboring countries that supply such equipment to the Uruguayan market.

43. While consumption of R-508B and HFC-23 was very small, the Secretariat enquired whether the country had considered implementing restrictions (e.g., a ban) on the import of new R-508B- and HFC-23-based equipment so as to avoid adding to the bank of such equipment, while noting that equipment already existing in the country may need to continue to be serviced for some time. UNDP clarified that R-508B- and HFC-23-based equipment was very specialized, carefully monitored, and growth of such specialized equipment was unlikely given its niche application and, accordingly, did not consider it necessary to implement restrictions on new R-508B and HFC-23-based equipment.

44. Regarding regulatory measures to support the implementation of the KIP, UNDP informed that regulations that require the recovery of controlled substances during servicing of RAC; prevent venting of controlled substances during installation, servicing and decommissioning of RAC equipment; require leak checks for larger equipment, controlled substances and equipment logbooks for systems; mandate recovery of controlled substances from containers and equipment at their end-of life; and prohibit disposable cylinders will be all be assessed in a later stage of the KIP.

Technical and cost-related issues

45. The Secretariat enquired whether UNDP had considered the merit in procuring refrigerant identifiers for customs under the KIP. As the three identifiers purchased under stage I of the HPMP were not suitable for identifying blends of HFCs, it was agreed to procure two identifiers using savings achieved by rationalizing the customs trainings.

46. Stage II of the HPMP included a pilot project to demonstrate the use of transcritical CO₂ refrigeration system in the supermarket sector in coordination with the Uruguayan Supermarket Association. UNDP informed that further to the project, three supermarkets had installed CO₂-based refrigeration systems, and four more supermarkets were in the process of installing such systems.

47. Noting that the content of RAC technician training courses was updated under the HPMP to include the handling of low-GWP refrigerants, it was agreed to focus the update to the training courses on servicing large-charge equipment based on low-GWP refrigerant charges, electrical and electronic basics and welding, thereby allowing the budget for this activity to be reduced from US \$10,000 to US \$5,250. In addition, the Secretariat noted that the cost of the CO₂ demonstration unit was higher than seen in other projects and it was agreed to rationalize those costs by US \$10,000. Finally, it was agreed to rationalize the costs of the PMU to US \$29,250. Given the relevance of the MAC sector to the country's consumption, and that the sector had not received assistance through the Multilateral Fund for over a decade, the Secretariat and UNDP discussed opportunities to further strengthen the capacity of the sector and agreed to use the aggregated savings of US \$18,000, resulting from the changes discussed above, to organize two additional training courses for 40 MAC technicians. UNDP confirmed the registry of MAC workshops would be operational by December 2026.

Project management unit

48. Funding for the project management unit (PMU) was agreed at US \$29,250 (US \$19,650 for UNDP and US \$9,600 for UNIDO) based on national consultants (US \$23,000) and travel (US \$6,250), accounting for 10 per cent of the project costs.

Total project cost

49. The total cost of stage I of the KIP for Uruguay (without agency support costs) amounts to US \$325,000, based on the average HFC consumption in the refrigeration servicing sector in the years 2020-2022, in line with decision 92/37. The level of funds recommended remains as requested, with some internal reallocation of funding among activities, explained in the relevant sections above and summarized in table 10.

Table 10. Agreed cost of activities to be implemented during stage I of the KIP in Uruguay (US \$)

Project component	Agency	As submitted	Agreed
Project to strengthen the regulatory framework	UNIDO	35,000	35,000
Customs training programme	UNIDO	38,400	38,400
Training on low-charge appliances	UNIDO	22,660	22,660
Training on large-charge refrigeration systems	UNDP	106,720	91,970
Training programme in MAC	UNDP	62,720	80,720
Awareness-raising for end-users	UNDP	27,000	27,000
Project management and coordination	UNDP	22,750	19,650
Project management and coordination	UNIDO	9,750	9,600
Total	n/a	325,000	325,000

50. In line with Executive Committee decision 94/59, stage I of the KIP for Uruguay will be implemented in two tranches. In line with decision 94/59(b), the Secretariat and UNDP explored whether the third tranche of the stage II of the HPMP could be shifted from 2026 to 2027; however, this change was not requested to mitigate the risk of delaying the implementation of the HPMP. The schedule of phase-down commitments and funding tranches under stage I of the KIP and the schedule of phase-out commitments and funding tranches under stage III of the HPMP are presented in annex I.

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

51. As a result of the changes detailed above, US \$15,035 was shifted from the first to the second tranche based on the reduced cost of the CO₂ demonstration unit, for the update to the RAC technician training courses, and to the PMU; two additional training courses for MAC technicians were added to the second tranche.

Co-financing

52. The Government of Uruguay would provide in-kind co-financing through the provision of personnel, office and storage space, communications and administration, and legal support from the Ministry of Environment and the National Directorate of Customs on matters related to the legislative and regulatory framework to control HFC consumption.

2024-2026 business plan of the Multilateral Fund

53. UNDP and UNIDO are requesting US \$325,000, plus agency support costs, for the implementation of stage I of the KIP for Uruguay. The total value of US \$199,769, including agency support costs, requested for the period of 2024–2026, is US \$155,769 above the amount in the business plan.

Sustainability of the HFC phase-down and assessment of risks

54. UNDP noted that the country's most recent HFC consumption was substantially below the country's HFC baseline for compliance and, therefore, considered that the most significant risks to Uruguay's HFC phase-down were not in the short term but rather in the medium and long term. In particular, Uruguay's cooling sector was expected to continue to grow and, if left unaddressed, could put the country at risk of non-compliance in later years. That risk will be mitigated by the implementation of activities under the KIP, including, inter alia, the licensing and quota system; the strengthening of the servicing sector, including in particular in the commercial refrigeration and MAC sectors; the implementation of bans on the import and manufacturing of HFC-based domestic and standalone commercial refrigeration equipment; and awareness-raising activities. In addition, the activities proposed under the energy efficiency project described in paragraphs 59 to 79 of the present document are expected to contribute to the HFC phase-down by facilitating the introduction into the market of low-GWP, energy-efficient technology. The implementation of minimum energy performance standards, once developed, will ensure the sustainability of that intervention. The strengthening of training capacities in the country, together with the technician certification scheme being implemented under the HPMP, will help ensure the sustainability of the HFC phase-down.

Impact on the climate

55. The activities proposed, including increasing training capacity for alternatives to HFCs in the servicing sector, initiating programmes to improve servicing practices in the MAC sector; and to strengthen the regulatory environment indicate that the implementation of stage I of the KIP will reduce refrigerant emissions into the atmosphere, resulting in climate benefits. While the Secretariat is not able to provide an estimate of the avoided emissions from the implementation of the KIP at the present meeting, by 2029 Uruguay will have reduced its annual emissions by approximately 101,243 million CO₂-eq tonnes of HFCs, calculated as the difference between the HFC baseline for compliance and the 2029 target, assuming that all consumed HFCs would eventually have been emitted.

Draft Agreement

56. A draft Agreement between the Government of Uruguay 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.

57. If the Executive Committee so wishes, the funds for stage I of the KIP for Uruguay 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

58. The Executive Committee may wish to consider:

- (a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for Uruguay for the period 2024-2029 to reduce HFC consumption by 10 per cent of the country's baseline by 2029, in the amount of US \$367,250, consisting of US \$219,340, plus agency support costs of US \$28,514, for UNDP and US \$105,660, plus agency support costs of US \$13,736, for UNIDO, as reflected in the schedule contained in annex I to the present document;

- (b) Noting:
 - (i) The commitment of the country to ban the manufacture and import of HFC-based domestic refrigerators and standalone commercial refrigeration equipment by 1 July 2027 and 1 January 2029;
 - (ii) That a project to phase out HFCs contained in imported pre-blended polyols in the polyurethane foam sector in Uruguay would be subject to the decision taken by the Executive Committee on whether it would fund the phase-out of HFCs contained in imported pre-blended polyols;
 - (iii) That the Government of Uruguay will establish its starting point for sustained aggregate reductions in HFC consumption based on guidance provided by the Executive Committee;
 - (iv) 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;
 - (v) That the reductions from the country's remaining HFC consumption eligible for funding referred to in subparagraph (b)(iv) above will be deducted from the starting point referred to in subparagraph (b)(iii);
- (c) Approving the first tranche of stage I of the KIP for Uruguay and the corresponding tranche implementation plan, in the amount of US \$199,769, consisting of US \$126,927, plus agency support costs of US \$16,500, for UNDP and US \$49,860, plus agency support costs of US \$6,482, for UNIDO; and
- (d) Requesting the Government of Uruguay, UNDP, UNIDO and the Secretariat to finalize the draft Agreement between the Government of Uruguay 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

59. On behalf of the Government of Uruguay, 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 in the commercial refrigeration and residential AC sectors in the context of HFC phase-down (non-investment activities), in the amount of US \$300,000, plus agency support costs of US \$21,000, as originally submitted.⁷

Status of implementation of energy efficiency-related activities funded by the Multilateral Fund

60. Enabling activities for the Kigali Amendment for Uruguay, approved at the 80th meeting for a total of US \$150,000, excluding agency support costs, included activities to raise awareness on HFC phase-down and energy efficiency improvement and to review codes and standards for the efficient use of HFCs and ODS alternatives in the value chain.

Energy efficiency pilot project

61. Information on HFC consumption and distribution by sector; the established HFC baseline; the policy and regulatory framework to support the implementation of the KIP; and proposed activities for stage I of the KIP and the first tranche submitted to the current meeting, is available in paragraphs 7 to 58 of the present document.

Policy, regulatory and institutional framework

62. There are currently no minimum energy performance standards (MEPS) in Uruguay. Uruguay has developed an energy efficiency label for air conditioners⁸ and domestic refrigeration appliances;⁹ no such label exists for commercial refrigeration equipment. Under the guidance of the Ministry of Industry, Energy and Mining (hereafter MIE), a national plan for energy efficiency for 2015 to 2024 was approved on 3 August 2015 and under this plan a manual for energy efficiency certification in Uruguay was approved in 2016. Due to the age of equipment in the country, most equipment has not been evaluated against that certification; market introduction of new, energy-efficient equipment has been limited including due to the influence of price on consumer choices, and the lack of legal or regulatory incentives that require or promote the adoption of new, energy-efficient equipment.

Sectoral background

63. There has been substantial growth in the commercial refrigeration sector in the country given rising population and demand, resulting in increased use of refrigeration equipment in supermarkets, restaurants, bars, bakeries, convenience stores, small food shops, and more. Notwithstanding that growth, most equipment in use is HFC-based technology and more than five-years old. UNDP estimated that a 70 per cent improvement in energy efficiency could be achieved in equipment in this sector. Changes in technology to

⁷ As per the letter of 14 August 2024 from the Ministry of Environment of Uruguay to UNDP.

⁸ https://www.eficienciaenergetica.gub.uy/documents/20182/0/UNIT_1170_2023.pdf/8e14d30f-95d1-4969-82f4-70b2542abe3b

⁹ https://www.eficienciaenergetica.gub.uy/documents/20182/0/UNIT_1138_2023.pdf/467cab7f-c79f-4b42-899c-b7e7e6a5c9d6

more efficient systems that have electronic control systems are a challenge due to the lack of qualified technicians for installation and maintenance of such equipment.

64. Residential AC in Uruguay is mainly based on HFC-410A, although some equipment based on HFC-32 has begun to be introduced; most such equipment has inverter compressors. Residential heat pumps based on R-290 have not penetrated the market.

Project objective

65. The strategy to enhance the energy efficiency of technologies in the commercial refrigeration and residential AC sectors in the context of the phase-down of HFCs in Uruguay involves three main elements: supporting the development of a roadmap for the establishment of MEPS in collaboration with MIE; demonstration of R-290 technologies (monobloc¹⁰ technology for the storage of meat and other food in small supermarkets, and heat pumps for residential cooling); and technical assistance to promote the adoption of technology in both sectors.

Proposed activities

66. The proposed activities included under the three components are presented below along with the associated costs:

- (a) *Roadmap for development of MEPS:* An expert will be engaged to provide technical and policy support to the NOU and MIE, to design the roadmap to establish MEPS, and communicate the outcome to government stakeholders (US \$45,000);
- (b) *Demonstration projects:* Consultations to develop the criteria for the selection of pilot beneficiaries (US \$4,000); selection of beneficiaries and development of terms of reference for equipment with consideration of refrigerant use, energy consumption, conditions for installation and gender mainstreaming; monitoring of performance and maintenance needs, a survey of the beneficiaries and a detailed report (US \$5,000); purchase, installation and commissioning of six R-290 monoblocs (US \$90,000); purchase, installation and commissioning of eight R-290 residential heat pumps (US \$80,000); and
- (c) *Technical assistance to promote the adoption of technology:* Seven workshops on energy-efficient alternative technology to disseminate knowledge on R-290 monoblocs and R-290 heat pumps; awareness campaign in both sectors prior to implementation and after completion of the demonstration projects (US \$46,000).

67. The project coordination and management will be undertaken by the NOU at a cost of US \$30,000 to ensure the coordination of activities on energy efficiency and other projects funded by the Multilateral Fund, avoiding overlaps and working collaboratively with the MIE.

Total cost of the pilot project

68. The total cost of the project to maintain and enhance the energy efficiency of replacement technologies in commercial refrigeration and residential AC in the context of HFC phase-down amounts to US \$300,000, plus agency support costs, and will be implemented between December 2024 and December 2027.

¹⁰ Refrigeration equipment pre-charged with refrigerant and containing all components required for cooling (i.e., compressor, condenser, evaporator, expansion valves and fans) in a single unit.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

69. The Secretariat has reviewed the project proposal in light of the activities described under decisions 91/65 and, in line with that decision, confirmation from the Government of Uruguay has been received: that the NOU will coordinate with relevant energy efficiency authorities and national standards bodies to facilitate consideration of refrigerant transition when developing energy efficiency standards in the relevant sectors/applications; that, if Uruguay has mobilized or is 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 the 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 a detailed project report will be submitted to the Executive Committee within six months of the date of completion of the project.

Technical and cost-related issues

70. The Secretariat noted that the Global Environment Facility (GEF) had financed the Uruguay Energy Efficiency Project.¹¹ Among other activities, the project included the generation of standard contractual instruments to support projects executed by Energy Service Companies (ESCOs) and support for the creation of an ESCO market, and the creation of an Energy Efficiency Trust (EETF) to finance energy efficiency projects. This fund was intended to finance energy audits and the investments necessary to make improvements in energy use. The Secretariat sought to better understand the status of the ESCO market, including the number of active ESCOs and the type and value of projects they have supported; the status of the EETF; and how the EETF could be used to enable the sustainability of the demonstrated technologies after completion of the project.

71. UNDP explained that 81 ESCOs are registered in the country. While the value of projects undertaken with the assistance of the ESCOs was not available, UNDP noted that, to date, ESCOs have not targeted the RAC sector but have instead concentrated on clean energy generation (i.e., solar energy), energy audits, and the establishment of baseline information on energy use in industrial and commercial sectors. The EETF, which has been capitalized at a value of 400 million Uruguayan pesos (UI, approximately US \$9.6 million), is a guarantee fund that operates within the National Guarantee System. The maximum guarantee for a project involving the provision of energy-efficient equipment would be UI 277,000 (approximately US \$6,650) or 60 per cent of the value of the financed equipment, whichever is lower.

72. Noting the potential future opportunities to link outcomes of the demonstration project with the EETF; to develop policy mechanisms to support the sustained uptake of energy-efficient equipment; for co-financing from end users for the demonstration projects; and to ensure gender mainstreaming during project implementation, the Secretariat invited UNDP to consider submitting a revised proposal that, inter alia, would ensure that the development of the roadmap resulted in not only a technical document but also in engagement and capacity-building of stakeholders during the MEPS development process; and would create an enabling environment for the sustained uptake of energy-efficient equipment, including by building capacity and raising awareness among Government, end users, and technicians.

73. UNDP submitted a revised proposal that, further to a discussion with the Secretariat, was agreed. In line with decision 91/65(b)(vi), the country is prioritizing the development of MEPS, which at an initial stage would be expected to focus on domestic refrigerators, residential AC units, and residential heat

¹¹ The project was financed by the GEF through the World Bank with co-financing from the Ministry of Industry and Energy and the National Administration of Power Plants and Electrical Transmissions (UTE).

pumps, and at a later stage would also address standalone commercial refrigeration equipment. Development of the roadmap will include assessing RAC equipment installed and being imported into the country; assessing state-of-the-art RAC technology marketed globally, especially low- or zero-GWP technologies; developing a strategy that establishes the stages to be carried out to develop MEPS by MIE with the support of the Ministry of Environment; and designing mechanisms to support the adoption of energy efficiency measures.

74. The revised proposal includes establishing a coordination committee led by MIE, with the participation of the Ministry of Environment, the National Administration of Power Plants and Electrical Transmissions (UTE), and other stakeholders, which is expected to continue its work after the completion of the project. Technical assistance will be provided to develop mechanisms to promote energy-efficient low-GWP technologies, such as bulk procurement and a green procurement policy for Government; and for the development of mechanisms for the provision of financial incentives. It was agreed that UNDP would include a report on the outcomes of those technical assistance activities as part of the request for the second tranche of the KIP.

75. Regarding the demonstration project, the number of R-290 monoblocks to be installed in small supermarkets as a replacement for existing R-404A refrigeration systems was adjusted in line with past precedent projects, noting that beneficiaries will provide the necessary civil works as co-financing, and the number of R-290 heat pumps that will replace R-410A AC units was adjusted to 20 based on 50 per cent co-financing from the beneficiaries. Training will be provided to supermarket staff and technicians and installers to ensure the safe installation and operation of the equipment. In addition, the manual on good practices for assembling and maintaining cold rooms being developed under stage III of the HPMP¹² will be updated to address energy efficiency; likewise, the curriculum for RAC training courses being updated under the KIP¹³ will also address energy efficiency. UNDP will monitor and report on the performance and energy use of both the baseline and newly installed equipment and disseminate the results and will undertake other awareness-raising activities. Table 10 summarizes the agreed costs and activities of the pilot project.

Table 10. Total cost of the energy efficiency pilot project for Uruguay as agreed

Area of activity	Activity	Cost (US \$)
Development of roadmap for MEPS	Set up a coordination committee led by MIE and with the participation of the Ministry of Environment and other stakeholders, and organization of four meetings of the committee	5,000
	Data collection and analysis for domestic refrigeration, residential AC and commercial refrigeration, including market study, desk study, and review of MEPS in other countries	10,000
	Training on MEPS for government representatives, technical team and NOU (2 workshops with 20 participants each)	10,000
	Assessment of RAC sector MEPS with energy efficiency policy of the country and related meetings	2,000
	Development of a document containing analysis, strategy, implementation process, monitoring and revision process for the implementing MEPS	5,000
	MEPS stakeholder meetings with governmental entities, private sector (equipment importers, installation companies, designers), technicians and end users (3 meetings with 20 participants each)	7,000
Policy and regulatory activities	Development of a mechanism to motivate stakeholders to adopt energy-efficient R-290-based monoblocks and residential heat pumps (e.g., bulk procurement, development of a green Government procurement policy, etc.) and report on the implementation of such mechanisms as part of the request for the second tranche of the KIP	5,000

¹² Table 4 and paragraph 33 of document UNEP/OzL.Pro/ExCom/86/80.

¹³ Table 9 of the present document.

	Technical assistance for the coordination committee to develop mechanisms (e.g., investment promotion, under EETF, etc.) to support the replacement of R-404A-based commercial refrigeration systems with R-290 monoblocks, and R-410A residential heat pumps with R-290 heat pumps, and report on the number of such installations supported or for which an application for support has been received ¹⁴ as part of the request for the second tranche of the KIP	5,000
R-290 demonstration projects	Selection of beneficiaries (develop criteria, public calls, consultation workshops, promoting the participation of women)	5,000
	Training of personnel at beneficiaries (for monoblocks) and technicians and installers for residential AC on safety and energy efficiency (5) (promoting the participation of women)	20,000
	Updating manual for cold rooms and RAC technician curriculum to include energy efficiency	15,000
	Purchase, installation and commissioning of 5 monoblocks (civil works co-financed by beneficiary)	90,000
	Purchase, installation and commissioning of 20 residential R-290 heat pumps with variable speed compressors (50 per cent incentive)	70,000
Sustainability activities	Development and implementation of system for project monitoring	4,000
	Visit of other cold storage users for pilot sites (20 participants including men and women)	10,000
	Analysis of results and development of material and dissemination campaigns (comparative analysis of the performance and energy usage of both the baseline and newly installed equipment)	15,000
	Awareness workshops for importers, end users, and other stakeholders (4)	10,000
	Award ceremony to recognize women's participating in the coordination committee, training workshops, stakeholder meetings and demonstration projects	5,000
	Sustainability coordinator	7,000
Total		300,000

Agreed cost of the pilot project

76. The cost of the project was agreed at US \$300,000, plus agency support costs of US \$21,000 for UNDP.

Sustainability of the pilot project and assessment of risks

77. 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. Mechanisms such as bulk and green Government procurement, once developed and implemented, will help ensure the sustained uptake of energy-efficient low-GWP-based equipment in the country. Likewise, technical assistance to develop mechanisms to incentivize the replacement of high-GWP-based, inefficient technology with energy-efficient, R-290-based technology and related awareness-raising activities, will support the sustained uptake of such technology.

78. Capacity-building of beneficiaries and installers of the R-290 pilot projects will minimize the risks associated with the use of flammable refrigerants. There is a significant risk that the uptake of R-290-based technologies will be limited as long as the price of such technologies is higher than that of high-GWP equipment already available in the market. Activities under the project to raise awareness of the benefits of

¹⁴ Funding for projects supported by the EETF would only be provided two years after the installation of the more energy efficient equipment.

such technology, including the savings that can be gained from the higher energy efficiency of the technology, can help mitigate this risk.

RECOMMENDATION

79. The Executive Committee may wish to consider approving the pilot project to maintain and/or enhance the energy efficiency of technologies in the commercial refrigeration and residential AC sectors in the context of HFC phase-down (non-investment activities) for Uruguay, in the amount of US \$ 300,000, plus agency support costs of US \$ 21,000 for UNDP, noting:

- (a) That the Government of the Uruguay 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 31 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 URUGUAY

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)	1,012,431	1,012,431	1,012,431	1,012,431	1,012,431	911,188	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO ₂ -eq tonnes)	1,012,431	1,012,431	1,012,431	1,012,431	1,012,431	911,188	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	126,927	0	0	92,413	0	0	219,340
2.2	Support costs for Lead IA (US \$)	16,500	0	0	12,014	0	0	28,514
2.3	Cooperating IA (UNIDO) agreed funding (US \$)	49,860	0	0	55,800	0	0	105,660
2.4	Support costs for Cooperating IA (US \$)	6,482	0	0	7,254	0	0	13,736
3.1	Total agreed funding (US \$)	176,787	0	0	148,213	0	0	325,000
3.2	Total support costs (US \$)	22,982	0	0	19,268	0	0	42,250
3.3	Total agreed costs (US \$)	199,769	0	0	167,481	0	0	367,250

HCFC phase-out management plan (stage III)

Row	Particulars	2020	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)	15.16	15.16	15.16	15.16	7.58	7.58	7.58	7.58	7.58	0	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	15.16	15.16	15.16	15.16	7.58	7.58	7.58	0.58	0.58	0	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	350,601	0	445,318	0	0	354,339	0	0	138,912	0	1,289,170
2.2	Support costs for Lead IA (US \$)	24,542	0	31,172	0	0	24,804	0	0	9,724	0	90,242
3.1	Total agreed funding (US \$)	350,601	0	445,318	0	0	354,339	0	0	138,912	0	1,289,170
3.2	Total support costs (US \$)	24,542	0	31,172	0	0	24,804	0	0	9,724	0	90,242
3.3	Total agreed costs (US \$)	375,143	0	476,490	0	0	379,143	0	0	148,636	0	1,379,412

Annex II

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

Category of activity	HPMP stage III		KIP – stage I		HPMP+KIP combined cost (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
Project to strengthen HFC regulatory framework on Kigali Amendment			- Review and update existing regulatory framework to adjust import quotas and other measures - Meetings/outreach on regulatory adjustments, and at least two meetings with stakeholders on measures to control HFC emissions and consumption - Preparation of sectoral energy efficiency and regulations for the import and installation of new refrigeration and air-conditioning systems	35,000	35,000
Technical assistance to control the illegal trade of ODS and strengthen the capabilities of the Customs National Direction	- Training of 100 customs officers on updated control measures and policies related to HCFC phase-out, and on the country's commitments under the Montreal Protocol; and training of 80 customs brokers on updated HCFC import/export control measures - Updated training courses for importers, brokers and customs officers on harmonized system and data reporting tools - Update of the online module for virtual training	92,400	Customs/importer training programme: - Two training courses to update a total of 40 border control officers on the regulations for the control of HFC - Design a border control handbook to assist customs officers - Two training workshops for a total of 40 brokers and importers on HFC policy and regulations	38,400	130,800
Development of technical standards on safety requirements for the use of flammable and other alternatives in refrigeration systems	Develop standards for the use of flammable refrigerants in servicing and assembly for integration into one national standard "Security in refrigeration systems", in accordance with ISO 5149 ("refrigerating systems and heat pumps- safety and environmental requirements"); and consultations with end-users, technicians, refrigeration associations and other stakeholders	41,800			41,800
Training of RAC technicians in good practices and promotion of lower-GWP refrigerants	Training of 500 RAC technicians on good refrigeration practices through 24 week-long training programmes, and updating of training content to include the handling of low-GWP	455,400	Training on low-charge domestic refrigerators, including procuring two R-600a domestic refrigeration training units and two R-290	114,630	570,030

Category of activity	HPMP stage III		KIP – stage I		HPMP+KIP combined cost (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
	refrigerants (e.g., flammable, HFO and CO ₂) • Six train-the trainer sessions on good refrigeration practices, training a minimum of 40 trainers and senior engineers from end-user maintenance departments, universities and the LATU • Thirty 2-day technical seminars for 300 technicians and stakeholders to address specific technical topics in the refrigeration servicing sector (e.g., cold milk tanks, cold rooms, cold food chambers) • Six specialized training workshops for 120 installer engineers, heads of end-user maintenance departments and end-user decision-makers to review emerging technologies (e.g., use of ammonia or flammable refrigerants, inverter technology)		medium-temperature commercial refrigeration training units. Four training workshops for RAC technicians • Training on large charge commercial installations, including procuring at least two R-290 AC training units, two R-290 low-temperature commercial refrigeration units, and one basic CO₂ demonstration system. Eleven training workshops for RAC technicians • Expert to update curriculum for training courses • Development of an electronic registry for trained technicians		
Technical assistance for recovery and recycling (R&R) of HCFC-22	• Seven workshops promoting R&R practices for 80 end-users and technicians • Provision of five sets of R&R equipment¹ to be managed by the NOU for eventual transfer to the RAC association Initiate discussions between NOU and RAC association for possible controls prohibiting venting of refrigerants during maintenance and servicing of equipment	99,000			99,000
Capacity-building for LATU and expansion of laboratory capacity to support the RAC training programme	• Provision of laboratory equipment² for LATU • Establishment of a second technical laboratory in a technical institution outside Montevideo (capital city) and provision of tools Five train-the-trainer workshops for 40 trainers of the LATU with support from international experts	303,600			303,600
Pilot projects for HCFC conversions to zero-ODP, low-GWP alternatives and technical assistance for supermarkets	• A pilot conversion/replacement to demonstrate the use trans-critical CO₂ refrigeration system in the supermarket sector in coordination with the Uruguayan Supermarket Association • Training workshops for end-users on the technical	148,500			148,500

¹ Recovery-recycling machines, small recovery machines, vacuum pumps, gas identifier, tanks and cylinders.

² Portable recovery machines, refrigeration training units (simulators), tools to handle flammable refrigerants, and updates of electronics (e.g., vacuum pumps, scales, expander tools, capillary tube cutters, pliers, hoses, recovery cylinders, and tools to handle flammable refrigerants).

Category of activity	HPMP stage III		KIP – stage I		HPMP+KIP combined cost (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
	and environmental benefits of the trans-critical CO ₂ refrigerants • Preparation of a roadmap to adopt trans-critical CO ₂ refrigeration technology in the sector				
Training programme in MAC sector			- Identify and register MAC servicing workshops - Develop training materials - Procure three recovery and recycling machines 11 training courses for 220 MAC technicians	80,720	80,720
Awareness-building campaigns for end-users, technicians and installers of equipment	- Updating awareness materials to support the webpage managed by the NOU focusing on HPMP-related activities - Developing and conducting three awareness-raising campaigns to promote the certification programme for technicians, encourage the use of products with low-GWP refrigerants, and support good servicing practices by end-users	31,350	- Design specific campaigns for differentiated audiences - Three information workshops on the control HFC gases in different applications and promote the advantages of new technology - Development of a national register of large and medium-sized HFC end-users in RAC sectors	27,000	58,350
Project monitoring unit (PMU) supervised by the NOU	Preparation of progress reports, and follow-up meetings and workshops with stakeholders	117,120	KIP implementation and monitoring	29,250	149,620
Total	n/a	1,289,170	n/a	325,000	1,614,170