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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-third Meeting
Montreal, 15-19 December 2023
Item 9(d) of the provisional agenda¹

PROJECT PROPOSAL: PANAMA

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

Phase-down

- Kigali HFC implementation plan (stage I, first tranche) UNDP

¹ UNEP/OzL.Pro/ExCom/93/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

PANAMA

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

(II) LATEST ARTICLE 7 DATA (Annex F)	Year: 2022	1,369.96 mt	2,708,376 CO ₂ -eq tonnes
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (CO₂-eq tonnes)							Year: 2022	
Chemical	Aerosol	Foam	Firefighting	AC and refrigeration		Solvent	Other	Total sector consumption
				Manufacturing	Servicing			
HFC-23					888			888
HFC-32					203			203
HFC-134a					792,992			792,992
R-404A					607,260			607,260
R-407C					4,222			4,222
R-410A					784,211			784,211
R-507A					325,335			325,335
CustMix-134*		193,265						193,265

*93% of HFC-365mfc and 7% of HFC-227ea

(IV) AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING	882 mt	1,897,583 CO ₂ -eq tonnes
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(V) CONSUMPTION DATA (CO₂-eq tonnes)			
Baseline: average 2020-2022 HFC consumption plus 65% of HCFC baseline	2,543,386	Starting point for sustained aggregate reductions	TBD
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved	0	Remaining	TBD

(VI) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
UNDP	HFC phase-down (CO ₂ -eq tonnes)	0	0	0	0
	Funding (US \$)	128,000	0	0	128,000

(VII) PROJECT DATA		2023	2024-2025	2026	2027-2028	2029	Total	
Consumption (CO ₂ -eq tonnes)	Montreal Protocol limits	n/a	2,543,386	2,543,386	2,543,386	2,289,047	n/a	
	Maximum allowable	n/a	2,543,386	2,543,386	2,543,386	2,289,047	n/a	
Amounts requested in principle (US \$)	UNDP	Project costs	331,100	0	264,880	0	66,620	662,200
		Support costs	23,177	0	18,542	0	4,635	46,354
Amounts recommended in principle (US \$)	Total project costs	331,100	0	264,880	0	66,620	662,200	
	Total support costs	23,177	0	18,542	0	4,635	46,354	
	Total funds	354,277	0	283,422	0	71,255	708,554	

(VIII) Request for approval of funding for the first tranche (2023)		
Implementing agency	Funds recommended (US \$)	Support costs (US \$)
UNDP	331,100	23,177
Total	331,100	23,177

Secretariat's recommendation:	Individual consideration
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PROJECT DESCRIPTION

1. On behalf of the Government of Panama, UNDP as the designated implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), in the amount of US \$495,000, plus agency support costs of US \$34,650, as originally submitted.²
2. The implementation of stage I of the KIP will assist Panama in meeting the target of 10 per cent reduction from its HFC baseline consumption by 1 January 2029.
3. The first tranche of stage I of the KIP has been requested at this meeting in the amount of US \$247,500, plus agency support costs of US \$17,325 for UNDP, as originally submitted, for the period of January 2024 to December 2025.

Background

4. The Government of Panama has ratified all amendments to the Montreal Protocol, including the Kigali Amendment on 28 September 2018. Panama has an HCFC consumption baseline of 24.78 ODP tonnes or 430.66 metric tonnes (mt) and is set to completely phase out consumption of HCFCs by 1 January 2030.³

Status of implementation of the HCFC phase-out management plan

5. Stage I of the HCFC phase-out management plan (HPMP) for Panama was originally approved at the 65th meeting⁴ to meet the 10 per cent reduction from the baseline by 2015, resulting in the phase-out of 4.78 ODP tonnes of HCFCs, at a total cost of US \$335,545, plus agency support costs.
6. Stage II of the HPMP for Panama was originally approved at the 76th meeting⁵ to reduce HCFC consumption by 35 per cent from the baseline by 2020, at a total cost of US \$723,654, plus agency support costs.
7. Stage III of the HPMP was approved at the 86th meeting and will phase out the remaining consumption of HCFCs by 2030, including a reduction of 97.5 per cent of the HCFC baseline by 2028. Stage III will be completed by 31 December 2031, as stipulated in the Agreement between the Government of Panama and the Executive Committee.

Status of implementation of HFC-related activities

8. At the 74th meeting, the Government of Panama received funding to conduct a survey on the use of alternatives to ozone-depleting substances (ODSs) (US \$110,000), which was completed in September 2017. At the 81st meeting, Panama received funding to implement the enabling activities for HFC phase-down (US \$150,000), which were completed in December 2021. These activities assisted the country *inter alia* in updating its licensing system to include HFCs and HFC blends; adjusting the reporting scheme to include HFC consumption; identifying capacity-building needs of refrigeration technicians to support the transition to alternatives; analysing policy options to facilitate HFC phase-down; and carrying out awareness-raising activities on the ratification and implementation of the Kigali Amendment.

9. In 2020, the national ozone unit (NOU), in collaboration with the Ministry of the Environment and the National Energy Secretariat, finalized the development of the Panama Cooling Plan with support from

² As per the letter of 18 August 2023 from the Ministry of Health of Panama to UNDP.

³ Except for those HCFCs allowed for a servicing tail between 2030 and 2040, where required, consistent with the provisions of the Montreal Protocol.

⁴ Decision 65/44

⁵ Decision 76/40

UNDP and funding from the Kigali Efficient Cooling Program (K-CEP), outlining the roadmap for a sustainable development of the refrigeration and air-conditioning (RAC) sector while ensuring the protection of the ozone layer, reduction of greenhouse gas emissions, and energy efficiency. Several further actions recommended in that plan are reflected in the KIP implementation plan.

Stage I of the Kigali HFC implementation plan

Policy, regulatory and institutional frameworks

10. The NOU is responsible for implementing ODS phase-out activities in Panama, including those under the KIP. The NOU reports to the General Sub-directorate of Environmental Health, under the Ministry of Health, which coordinates the implementation of international agreements on chemical substances.

11. The National Customs Authority (ANA) is the NOU's counterpart in controlling ODS and HFC consumption. In coordination with the NOU, ANA authorizes and controls the imports of ODSs and HFCs through the Integrated Customs Management System (SIGA). It plays a key role in preventing illegal trade in ODSs and HFCs and in controlling the Colón Free Trade Zone (FTZ) operations.

12. Since ratifying the Kigali Amendment in 2018, the Government of Panama has approved a ministerial resolution establishing the mechanisms for regulating and controlling HFCs imports, both in pure form and in blends. This legal instrument sets out the schedule of HFC consumption phase-down from 1 January 2024 onwards and a system of distributing and allocating HFC quotas, including the registration process for importers and the import authorization and quota transfer procedures.

13. The Government of Panama adopted the seventh amendment to the World Customs Organization's Harmonized System (HS) of Designation and Coding of Goods, in effect as of 1 January 2022, adding specific detailed tariff items for identifying HFCs.

14. The National Strategy for Rational and Efficient Energy Use, approved on 1 June 2022, sets out actions linked to the development, review, and issuance of technical standards and regulations on energy efficiency; the development of standards on the global-warming potential (GWP) of refrigerant gases contained in RAC equipment; and the design and implementation of a programme for early replacement of RAC equipment. In 2023, the Government updated national energy-efficiency standards by approving the Central American Technical Regulation applicable to split-on/off air conditioners, to enter into force as of 2 December 2023; regional energy-efficiency standards applicable to split inverter air conditioners and domestic refrigerators are currently undergoing the process of approval.

15. In 2021, the Governmental Technical Committee on Refrigerants was established, and later developed several technical standards on the safe and environmentally sound use of refrigeration systems and relevant substances. Consequently, the Government adopted the ISO 5149 1:2014 standard (Refrigerating Systems and Heat Pumps: Safety and Environmental Requirements), and is currently preparing a technical regulation that will elaborate on aspects of standards approved so far.

Minimum energy performance standards

16. The Government of Panama has adopted six norms and technical regulations on labelling and minimum energy performance standards (MEPS) for air conditioners, refrigerators, and motors.

HFC consumption

17. Panama only imports HFCs for use in the RAC servicing sector and for the manufacturing of pre-blended polyols. In 2022, the most consumed substances included HFC-134a (29.3 per cent of total

HFC consumption in CO₂-equivalent (CO₂-eq) tonnes), R-410A (29.0 per cent), R-404A (22.4 per cent), R-507A (12.0 per cent), the HFC-227ea/HFC365mfc blend (7.1 per cent), and R-407C (0.2 per cent). Table 1 presents the country's HFC consumption as reported under Article 7 to the Ozone Secretariat.

Table 1. HFC consumption in Panama (2019–2022 Article 7 data)

HFC	GWP	2019	2020	2021	2022	Share of HFC consumption in 2022 (%)
mt						
HFC-23	14,800	0.00	0.00	0.00	0.06	0.0
HFC-32	675	0.00	0.00	0.00	0.3	0.0
HFC-134a	1,430	407.86	348.69	384.53	554.54	40.5
R-404A	3,921.6	72.75	76.73	107.42	154.85	11.3
R-407A	2,107	0.34	0.00	0.00	0.00	0.0
R-407C	1,773.85	3.93	11.98	12.07	2.38	0.2
R-410A	2,087.5	221.61	160.19	240.62	375.67	27.4
R-417A	2,346	0.39	1.35	0.32	0.00	0.0
R-422D	2,728.95	0.02	0.00	0.00	0.00	0.0
R-425A	1,505.12	0.14	0.00	0.00	0.00	0.0
R-437A	1,805.05	0.06	0.00	0.01	0.00	0.0
R-438A	2,264.44	3.18	1.18	0.45	0.00	0.0
R-452A	2,139.25	0.00	0.07	0.00	0.00	0.0
R-507A	3,985	54.85	54.61	75.84	81.64	6.0
CustMix-134	963.82	0	98.84	186.02	200.52	14.6
Total (mt)		765.13	753.64	1007.28	1369.96	100
CO₂-eq tonnes						
HFC-23	14,800	0.00	0.00	0.00	888	0.0
HFC-32	675	0.00	0.00	0.00	203	0.0
HFC-134a	1,430	583,240	498,627	549,878	792,992	29.3
R-404A	3,921.6	285,296	300,904	421,258	607,260	22.4
R-407A	2,107	716	0.00	0.00	0.00	0.0
R-407C	1,773.85	6,971	21,251	21,410	4,222	0.2
R-410A	2,087.5	462,611	334,397	502,294	784,211	29.0
R-417A	2,346	915	3,167	751	0.00	0.0
R-422D	2,728.95	55	0.00	0.00	0.00	0.0
R-425A	1,505.12	211	0.00	0.00	0.00	0.0
R-437A	1,805.05	108	0	18	0.00	0.0
R-438A	2,264.44	7,201	2,672	1,019	0.00	0.0
R-452A	2,139.25	0.00	150	0.00	0.00	0.0
R-507A	3,985	218,577	217,621	302,222	325,335	12.0
CustMix-134	963.82	0	95,264	179,290	193,265	7.1
Total (CO₂-eq tonnes)		1,565,901	1,474,052	1,978,141	2,708,376	100

18. The drop in HFC consumption observed from 2019 to 2020 was due to the effects of the COVID-19 pandemic, noting that the importation of HFC-365mfc/HFC-227ea for polyol blending balanced the decrease in imports of HFC-134a, R-404A, and R-507A over that period. After 2020, HFC consumption in Panama has grown, reflecting the increased demand for RAC appliances paired with HCFC phase-out and the accumulation of equipment servicing needs postponed during the pandemic. As the country is experiencing economic growth, demand for HFCs is expected to continue rising, posing a challenge to achieving consumption targets by 2024 and 2029.

Country programme implementation report

19. The Government of Panama reported in its 2022 country programme implementation report the HFC sectoral consumption data consistent with the data reported under Article 7 of the Montreal Protocol.

HFC distribution by sector

20. Based on the HFC survey carried out during the preparation of the KIP, the national demand for HFCs is the highest in the RAC servicing subsectors, including the local installation and assembly subsector (85 per cent in mt and 93 per cent in CO₂-eq tonnes), and in the manufacturing of pre-blended polyols, mostly for export (15 per cent in mt and 7 per cent in CO₂-eq tonnes).

21. In the servicing sectors, HFCs are mainly used in the commercial refrigeration (28.9 per cent in mt and 31.6 per cent in CO₂-eq tonnes), commercial and industrial air-conditioning (AC) (27.1 per cent in mt and 27.5 per cent in CO₂-eq tonnes), industrial refrigeration (9.7 per cent in mt and 16.8 per cent in CO₂-eq tonnes), and other subsectors, as shown in table 2.

Table 2. HFC consumption in Panama by sector (2022)

Sector	HFC -32	HFC -134a	CustMix -134	R -404A	R -407C	R -410A	R -507A	Total	Share of total (%)
mt									
Manufacturing									
PU foam (mainly for pre-blended polyols)	0	0	200.52	0	0	0	0	200.52	15.8
Subtotal manufacturing	0	0	200.52	0	0	0	0	200.52	15.8
Refrigeration and AC servicing									
Refrigeration subsectors									
Domestic	0	18.14	0	0.00	0	0	0	18.14	1.4
Commercial	0	262.34	0	74.27	0	0	30.79	367.40	28.9
Industrial	0	25.35	0	57.32	0	0	40.04	122.71	9.7
Fishing fleet	0	36.54	0	0.00	0	0	1.63	38.17	3.0
Transport	0	7.44	0	13.03	0	0	0	20.47	1.6
AC subsectors									
Residential	0	0	0	0	0	52.93	0	52.93	4.2
Commercial and industrial	0.04	45.45	0	0	2.18	296.40	0	344.07	27.1
Mobile	0	106.59	0	0	0	0	0	106.59	8.4
Subtotal servicing	0.04	501.85	0	144.62	2.18	349.33	72.46	1070.48	84.2
Total all sectors	0.04	501.85	200.52	144.62	2.18	349.33	72.46	1,271.00	100
CO₂-eq tonnes									
Manufacturing									
PU foam (mainly for pre-blended polyols)	0	0	193,265	0	0	0	0	193,265	7.7
Subtotal manufacturing	0	0	193,265	0	0	0	0	193,265	7.7
Refrigeration and AC servicing									
Refrigeration subsectors									
Domestic	0	25,940	0	0	0	0	0	25,940	1.0
Commercial	0	375,146	0	291,257	0	0	122,698	789,102	31.6
Industrial	0	36,251	0	224,786	0	0	159,559	420,596	16.8
Fishing fleet	0	52,252	0	0	0	0	6,496	58,748	2.3
Transport	0	10,639	0	51,098	0	0	0	61,738	2.5
AC subsectors									
Residential	0	0	0	0	0	110,491	0	110,491	4.4
Commercial and industrial	24	64,994	0	0	3,867	618,735	0	687,619	27.5
Mobile	0	152,424	0	0	0	0	0	152,424	6.1
Subtotal servicing	24	717,646	0	567,142	3,867	729,226	288,753	2,306,657	92.3
Total all sectors	24	717,646	193,265	567,142	3,867	729,226	288,753	2,499,923	100

Note: There are differences between the 2022 reported imports (top-bottom approach) and the use estimated in this table (bottom-up approach) that can be attributed to uncertainties associated with field data and the statistical method (*inter alia* estimated leakage rates, fluctuations in country conditions, aggregation of equipment units in official data, and limitations of the sampling process).

Manufacturing sector

22. Imports of the HFC-365mfc/HFC-227ea blend (at a rate of 93:7) for the manufacture of pre-blended polyols in the FTZ by Synthesia, a non-Article-5-owned enterprise, are counted as part of the country's total HFC consumption. Some of these polyols are used within Panama to manufacture polyurethane (PU) foams, but most are exported to other countries in the region. In 2022, 193,265 CO₂-eq tonnes of HFCs contained in pre-blended polyols were consumed in Panama's manufacturing sector and regional distribution chain, representing 7.7 per cent of that year's total HFC consumption.

23. Out of the five PU foam sector enterprises assisted in stage II of the HPMP, three (Fibropinturas, Cangas Trucks, and Refrigeracion Internacional, S.A.) were using HFO-based systems in the first year after conversion. Subsequently, due to the high price of HFOs, they switched to HFC-based polyols. The remaining two enterprises (Disur and Refratermic) withdrew from stage II of the HPMP. Disur has been using cyclopentane-based polyols, while Refratermic is no longer producing PU foam.

24. A few additional small PU foam manufacturing enterprises in the country use 3.40 mt of HFCs contained in pre-blended polyols provided by Synthesia. The foam sector, including import controls on HFC-based polyols, will be considered in further KIP stages once a cost-effective low-GWP technology is available in the country.

Aerosol and solvent manufacturing and firefighting sectors

25. HFCs are neither used as propellant in the manufacturing of aerosols nor as solvents for technical and industrial use in the country.

26. Fire extinguishers come from imports, with moderate quantities of HCFC- and HFC-based extinguishers used exclusively for server rooms, telecommunication systems, and engine compartments.

Refrigeration and air-conditioning servicing sector

27. Approximately 3,000 technicians (including 50 to 60 women) and 300 workshops are consuming HFCs in Panama. Most technicians have acquired their skills through self-training and 2,100 technicians have received training in good servicing practices. HFCs are consumed in all RAC servicing subsectors, as described below.

Domestic, commercial, industrial, and transport refrigeration servicing

28. About 1.3 million domestic refrigerators in the country are charged predominantly with R-600a (60 per cent) and HFC-134a (40 per cent). Sixty-five per cent of commercial refrigeration systems, including medium- and low-temperature equipment for storing food products in restaurants, hotels, supermarkets, and convenience stores, use HFCs (mostly HFC-134a and R-404A), 28 per cent use hydrocarbons (HCs) (R-600a and R-290), 2 per cent use HCFC-22, and the remaining 5 per cent use mainly ammonia and minor rates of carbon dioxide. Small quantities of R-422D, R-425A, and R-437A have been occasionally imported to replace HCFC-22 and R-507C in several commercial appliances; they will not be necessary in the future.

29. The food industry uses larger-capacity equipment for direct expansion refrigeration systems (with refrigerants such as HFC-134a, R-404A, R-507A, and minor rates of R-438A) at high, medium, and low temperatures. This market includes the agro-industrial plants for fruits and vegetables, meat and dairy product processing, the fishing industry, central kitchens, logistics operators, and others. Large food industries, such as poultry, slaughterhouses, seafood plants, ice factories, and dairy industries, operate with refrigeration systems generally based on ammonia.

30. Transport refrigeration meets the needs of the cold chain for refrigerated foodstuffs, using HFC-134a and R-404A in land transportation and HFC-134a and R-507A in the fishing fleet, with minor consumption of HFC-23 and R-452A.

Residential and commercial air-conditioning servicing

31. Residential air conditioners are mainly used in households, charged with R-410A in 85 per cent of the cases, and with HCFC-22 for the remaining 15 per cent. Commercial and industrial AC equipment is primarily used in the tourism sector, as well as in supermarkets and the public sector. Approximately 60 per cent of installed units use R-410A, almost 40 per cent use HCFC-22, and there are minor uses of R-407C, R-417A and HFC-32.

Mobile air-conditioning servicing

32. This sector, not assisted during the HPMP, consumes 6 per cent (in CO₂-eq tonnes) of all HFCs used in the country. Approximately 700,000 vehicles circulating in Panama have AC installations based on HFC-134a, with a small percentage of high-end vehicles using HFO-1234yf-based systems.

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

Overarching strategy

33. Stage I of the KIP for Panama is proposed to be implemented simultaneously with the HPMP until 2029, with subsequent stages to address the 2035, 2040, and 2045 phase-down targets. Stage I will focus on achieving the consumption freeze in 2024 and a 10 per cent reduction from the HFC baseline by 2029 through the implementation of activities in the servicing sector.

34. The freeze of HFC consumption will be primarily supported by the application of the quota system. As a necessary step to achieving the 10 per cent reduction from its baseline, the country plans to reduce national demand for HFCs through policy actions including the development of green procurement guidelines for the public sector, capacity building of servicing technicians in the proper handling of flammable refrigerants, promotion of low-GWP and energy-efficient technologies among end users, and of refrigerant recovery and recycling in the RAC and mobile air-conditioning (MAC) sectors.

Established HFC baseline and proposed reductions

35. The Government of Panama reported its Article 7 data for 2020-2022. By adding 65 per cent of the HCFC baseline in CO₂-eq tonnes to the average HFC consumption in 2020-2022, the established HFC baseline is calculated at 2,543,386 CO₂-eq tonnes, as shown in table 3.

Table 3. HFC baseline for Panama (CO₂-eq tonnes)

Baseline calculation	2020	2021	2022
HFC annual consumption	1,474,052	1,978,141	2,708,376
HFC average consumption 2020-2022	2,053,523		
HCFC baseline (65%)	489,863		
Established HFC baseline	2,543,386		

36. The Government of Panama and UNDP have projected an increase in HFC consumption at a 1 per cent annual growth rate, assuming stabilization of the economy in the coming years in the unconstrained, business-as-usual scenario. The estimated HFC consumption runs the risk of potential non-compliance with the country's 2024 and 2030 consumption targets, as shown in table 4.

Table 4. Unconstrained scenario of HFC consumption and required reductions (CO₂-eq tonnes)

	2022*	2023	2024	2025	2026	2027	2028	2029
Montreal Protocol limits	n/a	n/a	2,543,386	2,543,386	2,543,386	2,543,386	2,543,386	2,289,047
Total estimated consumption	2,708,376	2,735,460	2,762,814	2,790,443	2,818,347	2,846,530	2,874,996	2,903,746
Required reductions	n/a	n/a	219,428	247,057	274,961	303,144	331,610	614,698

* As per Article 7 data reported by the Government of Panama.

37. As shown above, in an unconstrained scenario, HFC consumption in the country would need to be reduced by 219,428 CO₂-eq tonnes in 2024 to meet the freeze level, and by 614,698 CO₂-eq tonnes in 2029 to achieve the 10 per cent reduction from the baseline.

Proposed activities

38. The activities proposed in stage I of the KIP will support the country in meeting the first two phase-down targets of the Kigali Amendment, and create conditions for an appropriate and sustainable adoption of low-GWP alternatives through actions undertaken in four strategic lines: strengthening of the legal and enforcement framework regarding HFCs; capacity building in the RAC and MAC servicing sectors; promotion of low-GWP, energy-efficient technologies among end users in the health sector and the cold chain; and promotion of reductions in HFC emissions through good practices and refrigerant recovery and recycling in the RAC and MAC sectors. As submitted, the budget for stage I was established at US \$495,000, and subsequently revised as explained in paragraphs 58 to 63 below. The proposed activities and their costs are presented in table 5.

Table 5. Activities proposed for implementation in the servicing sector under stage I of the KIP

#	Activities and sub-activities	Cost as submitted (US \$)	Adjusted cost (US \$)
I.	Strengthening of the legal framework and inter-institutional coordination		
I.1	Updating the training programme for customs officials to include the monitoring and recording of the imports and exports of pure and blended HFCs using the HS tariff codes; carrying out annual meetings for authorities responsible for HFC trade control; and following up on relevant agreements and results	10,000	15,000
I.2	Development of at least two national labour competency standards on the safe use of HCs as refrigerants in the RAC sector and on the appropriate use of HFCs and other refrigerants in the MAC sector; definition of guidelines for handling HFCs and unwanted RAC equipment; and development of a list of GWP indexes for lower-GWP technologies available in the country's market	20,000	30,000
I.3	Development of annual awareness-raising campaigns for consumers and dissemination of information on the Kigali Amendment through social media and brochures, including the development of at least one infographic and one video	10,000	20,000
I.4	Development of a plan for integrating the gender perspective in the implementation of KIP activities	10,000	20,000
<i>Subtotal for component I</i>		<i>50,000</i>	<i>85,000</i>
II	Enhancing the national capacities for good practices and management of low-GWP alternatives in the servicing sectors		
II.1	Promoting curricula updates for RAC training programmes in at least three vocational training institutes, with emphasis <i>inter alia</i> on HC refrigerants and good practices in the MAC sector; encouraging the inclusion of alternative technologies and energy efficiency in the curricula of the engineering courses of the Panama Polytechnic; development and implementation of two presential	85,000	96,000

#	Activities and sub-activities	Cost as submitted (US \$)	Adjusted cost (US \$)
	refresher courses on the best practices in servicing refrigeration equipment based on R-600a, and on R-290 and good practices in handling refrigerants in the MAC sector, for approximately 20 trainers each and a webinar course on innovative, efficient, and low-GWP cooling technologies; training of 240 RAC technicians on the safe handling of refrigerants and 45 MAC technicians on the good practices in handling refrigerants; acquisition and provision of 11 kits of equipment, tools and supplies to training institutions ⁶ to promote good practices and the safe handling of HCs, and of two kits to promote good practices in MAC servicing; and coordination of the digital registration process for technicians and servicing workshops in the RAC and MAC sectors		
II.2	Support provided to the Vocational Training Institute (INADEH) in designing, developing, and validating the curricula for new training programmes and courses for RAC and MAC technicians; and development and printing of related training manuals	15,000	50,000
II.3	Training and certification of labour-competency evaluators on the newly approved certification standards; accreditation of assessment centres; encouragement of women's participation in the labour competency programmes; and promotion of the certification processes for MAC and RAC servicing technicians	30,000	50,000
<i>Subtotal for component II</i>		<i>130,000</i>	<i>196,000</i>
III.	Advocacy and technical assistance for decreasing end-user demand for high-GWP refrigerants		
III.1	Development and implementation of a training programme for 20 decision makers and key stakeholders to promote energy-efficiency improvements and the use of low-GWP technologies at health facilities; and promotion of a case study undertaken at a public health facility, including the monitoring of thermal and energy performance of RAC equipment installed, recommendations to improve maintenance practices and acquire new equipment, if needed, and dissemination of results	40,000	40,000
III.2	Preparation of recommendations and criteria for prioritizing RAC equipment based on low-GWP refrigerants in the public procurement processes, and dissemination of those recommendations among relevant decision makers, partner institutions, and public agencies	20,000	20,000
III.3	Formalization of agreements with two end users in the cold chain to develop two demonstration projects for low-GWP systems used in new cold-room installations in small convenience stores; evaluation and selection of technology; design and installation of new cold rooms; training of technicians in charge of the installation and maintenance of those systems; additional training for instructors, technicians and end users in the sector; monitoring of the new systems' thermal and energy performance; systematization of the experience, including the identification of technical, commercial, regulatory, and gender barriers; and dissemination of project results	70,000	86,000
<i>Subtotal for component III</i>		<i>130,000</i>	<i>146,000</i>
IV	Promoting reductions in HFC emissions		
IV.1	Pilot project to evaluate the impact of good practices such as reduction of leakages and refrigerant recovery and recycling at one commercial refrigeration end user, including the selection and assessment of the beneficiary enterprise, definition of measurable variables before and after the intervention, information-gathering procedures, results analysis and dissemination, evaluation of the technical, operational, and financial impact of good refrigeration practices, preparation and dissemination of a report with the	45,000	45,000

⁶ Tentative list of tools and equipment for training institutes: recovery and recycling equipment, two-stage vacuum pump, digital vacuum gauge, digital thermometer and voltmeter, leak detector for HCs, four-way pressure gauges for R-290 and R-600a, oxyacetylene and nitrogen equipment, Mapp welding kit, cylinders of R-600a and R-290, Lokring kit, cutters, tubes, consumables, and spare parts.

#	Activities and sub-activities	Cost as submitted (US \$)	Adjusted cost (US \$)
	project's findings and recommendations to propel the adoption of good refrigeration practices at other end users, and a workshop held to disseminate project results and build awareness among end users and technicians		
IV.2	Promotion of good practices in the handling of refrigerant gases in MAC servicing, including the selection of 15 workshops offering diverse maintenance services; development of training material, guidelines, and posters on the application of good practices and procedures in the sector; and organization of five workshops on good practices for 10 employees from each of the selected MAC workshops	40,000	40,000
IV.3	Procurement and provision of equipment and tools ⁷ to nine workshops to implement good practices in MAC servicing, including the identification of equipment needs and procurement of tool kits for the workshops selected to participate in the good practices programme	7,485	25,000
IV.4	Strengthening of the HFC refrigerant recovery and recycling network ⁸ with the acquisition of tool kits for HFC-134a and R-507A for three collection centres, reinforcement of an existent reclaim centre, and provision of technical support for equipment installation and training	47,515	65,000
<i>Subtotal for component IV</i>		<i>140,000</i>	<i>175,000</i>
Total for activities in the servicing sector		450,000	602,000
Project coordination and monitoring		45,000	60,200
KIP total cost		495,000	662,200

Project implementation, coordination and monitoring

39. The Project Monitoring Unit (PMU), under the supervision of the National Ozone Officer, is in charge of planning, implementing, and supervising all activities under stage I of the KIP in Panama, while monitoring the country's compliance with its HFC phase-out commitments for the period 2024-2029.

40. Project coordination and monitoring accounts for 10 per cent of the total project costs requested and adjusted to US \$60,200 in line with the revisions mentioned in paragraph 38 above. The requested funds are to prepare the verification report (US \$15,000) and hire national consultants (US \$36,000) to provide support in the implementation of activities and the preparation of progress reports, organisation of meetings and monitoring-related travel (US \$8,000), and materials (US \$1,200).

Gender policy implementation

41. In line with decisions 84/92(d), 90/48(c) and 92/40(b), the Multilateral Fund's operational policy on gender mainstreaming will be applied to all activities implemented under the KIP with the support of a dedicated consultant. The NOU will work on removing barriers to women's entry into the servicing sectors, maximise the participation of women in KIP activities to collect gender-disaggregated data, including the gender dimension in the selection of beneficiaries for tools/equipment and support for certification; encourage women working in the field of refrigeration; and sensitise stakeholders to the gender policy of the Multilateral Fund.

⁷ Three sets containing a portable refrigerant gas recovery unit for use in MAC, two 30 lb recovery cylinders to store recovered gas, one 123 lb cylinder for non-reusable gas, leak detector, vacuum pump, and vacuumeter.

⁸ Three standard 250 lb recovery cylinders, air analyzer, nitrogen pressure gauge set and cylinder, digital vacuum gauge, cylinder cleaning power washer, cylinder cleaning tool set, tank weighing scales, analytical laboratory balance, Karl Fisher equipment for moisture content determination, analytical balance standard mass set, Karl Fisher balance and titrator installation, chlorine detection package, boiling point residue detection package, laboratory reagents and accessories package, and spare parts.

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

42. Stage I of the KIP will be implemented in three tranches. 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. The Government of Panama is committed to harmonizing the implementation of HPMP and KIP activities to the extent possible, on the understanding that separate agreements between the country and the Executive Committee will govern both multi-year projects. The activities to be implemented simultaneously under the HPMP and the KIP are listed in annex II to the present document.

43. The main activities of stage III of the HPMP, addressing *inter alia* improving the capacity of technicians in good servicing practices, strengthening the refrigerant recovery and recycling centres, strengthening the technical training centres in the area of good management of HCFCs, HFCs, and low-GWP alternatives, promoting a national certification strategy based on labour competency standards, and promoting the adoption of low-GWP alternative technologies, will be carried out simultaneously with and complemented by analogous activities implemented under stage I of the KIP.

44. Because HFC phase-down involves multiple refrigerants, both pure and blended, which had not been previously controlled under the Montreal Protocol, as well as the adoption of flammable, low-GWP alternatives to HFCs requiring particular conditions for use, the KIP will ensure that RAC technicians receive appropriate training on these technologies in updated courses on good refrigeration practices and in the demonstration projects on the advantages of adopting low-GWP, energy-efficient technologies at cold-chain end users. The KIP is also assisting the new MAC servicing subsector.

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

45. The first funding tranche of stage I of the KIP, initially requested in the amount of US \$225,225, as submitted, and revised to US \$331,100, includes the following activities, which will be implemented between January 2024 and December 2025:

- (a) *Strengthening of the legal framework and inter-institutional coordination:* Updating the training programme for customs officials to include the monitoring and recording of the imports and exports of pure and blended HFCs using the HS tariff codes; carrying out five coordination meetings for authorities responsible for HFC trade control; and following up on relevant agreements and results (US \$7,500); development of at least two national labour competency standards on the safe use of HCs as refrigerants in the RAC sector and on the appropriate use of HFCs and other refrigerants in the MAC sector (US \$10,000); development of an annual awareness-raising campaign for consumers and information dissemination on the Kigali Amendment through social media and brochures, including the development of at least one infographic and one video (US \$10,000); and the development of a work plan on gender mainstreaming in the implementation of the KIP (US \$10,000) (for a total of US \$42,500);
- (b) *Enhancing the national capacities for good practices and management of low-GWP alternatives in the servicing sectors:* Promoting curricula updates for RAC training programmes in at least three vocational training institutes, with emphasis *inter alia* on HC refrigerants and good practices in the MAC sector among other subjects; encouraging the inclusion of alternative technologies and energy efficiency in the curricula of the engineering courses of the Panama Polytechnic; development and implementation of two presentational refresher courses on the best practices in servicing refrigeration equipment based on R-600a, and on R-290 and good practices in handling refrigerants in the MAC sector, for approximately 20 trainers each; training of 240 RAC technicians on the safe handling of refrigerants and 45 MAC technicians on the good practices in handling refrigerants; acquisition and provision of 11 kits of equipment, tools and supplies to training institutions

to promote good practices and the safe handling of HCs, and of two kits to promote good practices in MAC servicing, and coordination of the digital registration process for technicians and servicing workshops in the RAC and MAC sectors (US \$96,000); support provided to INADEH in designing the curricula for new training programmes and courses for RAC and MAC technicians (US \$25,000); training and certification of labour-competency evaluators on the newly approved certification standards; and promotion of the certification processes for MAC and RAC servicing technicians (US \$25,000) (for a total of US \$146,000);

- (c) *Promoting reductions in HFC emissions*: Design, preparation, implementation, and assessment of a pilot project to evaluate the impact of good practices at one commercial refrigeration end user and preparation of a final report (US \$25,000); promotion of good practices in the handling of refrigerant gases in the MAC servicing, including the selection of 15 workshops offering diverse maintenance services; development of training material, guidelines, and posters on the application of good practices and procedures; and organization of five workshops on good practices for a total of 30 employees of the selected MAC workshops (US \$30,000); procurement and provision of equipment and tools to five workshops to implement good practices in MAC servicing, including the identification of equipment needs and procurement of tool kits for the five workshops selected to participate in the good practices programme (US \$12,500); and strengthening of the HFC refrigerant recovery and recycling network with the acquisition of tool kits for HFC-134a and R-507A for three collection centres, reinforcement of an existent reclaim centre, and provision of technical support for equipment installation and related training (US \$45,000) (for a total of US \$112,500); and
- (d) Project coordination and monitoring: preparation of a verification report (US \$7,500), hiring of consultants (US \$21,700), organization of meetings and monitoring-related travel (US \$4,000), and materials (US \$500) (for a total of US \$30,100).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

46. The Secretariat reviewed stage I of the KIP for Panama in light of the existing policies and guidelines of the Multilateral Fund, including decisions 91/38⁹ and 92/37,¹⁰ stage III of the HPMP, and the 2023-2025 business plan of the Multilateral Fund.

HFC consumption levels

47. For a better understanding of the HFC consumption patterns during the baseline years, UNDP separated the consumption from manufacturing from that in the servicing sector as shown in table 6, which also includes an estimation of the consumption in servicing under the scenario of no COVID-19-pandemic disruption, based on the average growth of the country's economy.

Table 6. HFC consumption patterns in the manufacturing and servicing sectors

Sector	Consumption (mt)				Consumption (CO ₂ -eq tonnes)			
	2019	2020	2021	2022	2019	2020	2021	2022
Total imports	765.13	753.64	1,007.28	1,369.96	1,565,901	1,474,052	1,978,141	2,708,376

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.

Sector	Consumption (mt)				Consumption (CO ₂ -eq tonnes)			
	2019	2020	2021	2022	2019	2020	2021	2022
Manufacturing	0	98.84	186.02	200.52	0	95,264	179,290	193,265
Servicing	765.13	654.80	821.26	1,169.44	1,565,901	1,378,788	1,798,851	2,515,111
Estimated consumption for servicing in a no-COVID scenario	765.13	856.95	959.78	1,074.95	1,565,901	1,753,809	2,104,571	2,357,119

48. UNDP explained that the country's 2022 consumption in servicing was less than 10 per cent higher than it would have been in a no-COVID scenario. The reason for this may be related to the servicing of equipment postponed during the pandemic years, reflected in the low consumption in 2020 and 2021 compared with a no-COVID scenario.

49. The Secretariat considers it important to continue monitoring the country's HFC consumption behaviour over the coming years to determine whether the high imports reported in 2022 are representative of the local market's regular consumption needs or were an isolated occurrence, expecting that by the time the next tranche request is submitted in 2026, the availability of data on longer-term HFC consumption trends will allow more clarity on the issue.

Overarching strategy

50. One of the challenges to reducing HFC demand in Panama includes the use of HFCs (7 per cent of the 2022 consumption in CO₂-eq tonnes) for blending polyols by Synthesia, which is not eligible for Multilateral Fund support. Although the HFC imports by this enterprise will be accounted for in the quota system, the development of a comprehensive regulatory framework for HFCs contained in polyols and the foam sector can only be included in further stages of the KIP, when non-HFC alternatives become more affordable.

51. Regarding the servicing sector, consumption growth rates in the RAC and MAC sectors, combined with the limited penetration of affordable, low-GWP alternatives, the absence of HFC-related policies to support the transition to low-GWP alternatives, and the lack of proper refrigerant recovery and recycling practices are the main barriers to the HFC phase-down that will be addressed through targeted activities under stage I of the KIP.

Established baseline, starting point for sustained reductions in HFC consumption, and reductions associated with stage I of the Kigali HFC implementation plan

52. The baseline for HFC consumption in the Panama is 2,543,386 CO₂-eq tonnes, as shown in table 3 above. The methodology for calculating the starting point for sustained reductions in HFC consumption is still under discussion. The Secretariat notes that the starting point for Panama will be established once the Executive Committee agrees on the above-mentioned methodology.

53. Noting that the rise in HFC consumption for the manufacturing of pre-blended polyols posed a concern, the Secretariat enquired how the reductions would be achieved, and specifically whether the HFC quotas would be reduced for both the servicing and manufacturing sectors, or only for servicing. UNDP explained that quotas would be issued in CO₂-eq tonnes based on the control measures and allocated to importers, not by sector. Furthermore, UNEP clarified that although the overall strategy for the KIP prioritized long-term solutions, the market would influence how the reductions were achieved, since the quota system gave flexibility to importers in selecting substances and their quantities, under the restriction of respecting the annual CO₂-equivalent assignment per each importer.

Policy, regulatory and institutional frameworks

54. Decision 87/50(g) requests the bilateral and implementing agencies, when submitting stage I of the KIPs, to include confirmation that the country has an established and enforceable national system of licensing and quotas for monitoring HFC imports/exports in place, consistent with decision 63/17. Accordingly, the Government of Panama has established a licensing and quota system for HFCs, with import quotas to be provided to importers in CO₂-eq tonnes, with flexibility to import any HFC as long as the quota is not surpassed. The HFC import quotas will start being applied in 2024 and the HFC import quota would be 2,515,546 CO₂-eq tonnes.

Technical and cost-related issues

55. Regarding mechanisms to foster non-HFC technology market penetration, UNDP understands that in stage I of the KIP, efforts are focused on different non-investment actions which will be laying the foundations for the correct adoption of new technologies and reducing emissions. Furthermore, awareness raising and capacity building among main users will make it clear to technicians and end users that losses of both refrigerant and energy are inconvenient from both the environmental and economic perspective.

56. The KIP proposal includes three pilot projects for commercial end users. One project would demonstrate the results of applying good practices in maintaining RAC equipment at one selected end user, including leakage control and prevention. The other two projects are to adopt low-GWP technology in new cold rooms for demonstration and promotion purposes.

57. In providing details on the pilot projects for adopting a new technology, UNDP indicated that the refrigerant would be R-290 and the potential replicability of this project was high, given that HFC-based cold rooms were widely used in food storage warehouses, meat industry, frozen products for export, fishing industry, and agricultural applications including storage of flowers, fruits, and vegetables. During the first tranche, end users who are representative of a sector or a specific application and can provide co-financing will be selected. Details regarding equipment capacity and selected user(s) will be provided along with the request for the second tranche of stage I of the KIP. The project includes the monitoring of thermal and energy performance of the equipment and training technicians in charge of the installation and maintenance of the systems. The Government of Panama will disseminate the results of the pilot project through a final report and a dissemination workshop. In line with decision 92/36, UNDP was requested to report, upon completion of this project, on the achieved HFC phase-out and energy-efficiency gains.

Total project cost

58. At the 92nd meeting, the Executive Committee agreed on funding at a level up to US \$5.10/kg for countries with consumption above 360 mt in servicing (decision 92/37(b)(iii)). The average HFC consumption in the refrigeration servicing sector during the baseline years in Panama was 881.83 mt, or 1,897,583 CO₂-eq tonnes. UNDP estimated the funding for stage I of the country's KIP by multiplying 10 per cent of the average HFC consumption in the servicing sector during the baseline years (881.83 mt) by US \$5.10/kg, for a total of around US \$450,000, plus 10 per cent for project coordination and monitoring (US \$45,000) (grand total of US \$495,000). However, this methodology does not address all the tonnage needed to achieve the 10 per cent reduction from the baseline, only the HFC consumption portion.

59. The Secretariat calculated the cost of stage I of the KIP using the methodology for converting US \$/kg to US \$/CO₂-eq tonnes in the servicing sector described in annex I of document 92/46.¹¹ A 10 per cent reduction from the consumption baseline of 2,543,386 CO₂-eq tonnes amounts to 254,339 CO₂-eq tonnes. To determine the cost of reducing 254,338.6 CO₂-eq tonnes in the servicing sector

¹¹ Paper on the starting point for sustained aggregate reductions based on discussions at the 91st meeting in the contact group on the cost guidelines for the phase-down of HFCs (decision 91/64(a)).

at US \$5.10/kg, the Secretariat converted this consumption to mt using the average GWP of the HFC consumption in the servicing sector in baseline years (servicing sector consumption in CO₂-eq tonnes (1,897,583) divided by consumption in mt (881.83)). The average GWP obtained is 2,152 and the phase-out tonnage required to reach the 10 per cent reduction is 118.19 mt (or 30 mt additional to the amount in the proposal as submitted).

60. The cost of phasing out 118.19 mt at US \$5.10/kg is US \$602,769. By adding the project coordination and monitoring costs, following the approach used for HPMPs for non-low-volume-consuming (LVC) countries,¹² the total cost of stage I of the KIP (without agency support costs) is US \$663,046, as presented in table 7.

Table 7. Cost calculation for stage I of the KIP for Panama

<i>HFC consumption in Panama</i>		
Established HFC consumption baseline	CO ₂ -eq tonnes	2,543,386
Average HFC consumption in the servicing sector in baseline years	mt	881.83
	CO ₂ -eq tonnes	1,897,583
Average GWP of HFC consumption in the servicing sector		2,152
<i>Reduction target stage I of the KIP</i>		
10 per cent reduction from the HFC baseline	CO ₂ -eq tonnes	254,339
	mt	118.19
<i>Cost of stage I of the KIP (servicing sector)</i>		
Agreed cost-effectiveness threshold	US \$/kg	5.10
Cost of reducing 118.19 mt at US \$5.10/kg	US \$	602,769
PMU costs (10% of total cost of stage I)	US \$	60,277
Total project cost	US \$	663,046

61. The Secretariat considers that this methodology ensures equal treatment for non-LVC countries, as each country will receive US \$5.10/kg and address 10 per cent of its baseline in CO₂-eq tonnes. With this approach, countries have flexibility to phase out or phase in selected HFCs based on national circumstances, as long as their total HFC consumption in CO₂-eq tonnes is 10 per cent below the baseline by 2029. The tonnage addressed, amounting to 254,339 CO₂-eq tonnes in the case of Panama, will be deducted from the starting point once the latter is agreed by the Executive Committee.

62. Upon discussion, UNDP revised its proposal for Panama, rounding the values calculated by the Secretariat to US \$662,200 to ensure that all tonnage to be reduced in stage I was addressed. While the strategy and the main components of stage I were maintained, the revised proposal expanded the scope of several key activities, including *inter alia* the acquisition of 11 tool kits for the safe handling of HCs (10 kits were initially planned) and two kits for good practices in MAC servicing (initially one kit) to be distributed among training institutions; provision of nine tool kits to MAC servicing workshops instead of three, and of an increased number of equipment units for the strengthening of the refrigerant recovery and reclaim network; reinforcing the budget for training, awareness raising, and technical experts; and an increased number of visits to beneficiary enterprises and training institutes and monitoring meetings with key stakeholders. The cost of all revised activities under stage I is reflected in table 5 above.

63. Stage I of the KIP includes three tranches: in 2023, 2026, and 2029, with 50 per cent of the total value of the stage to be released in the first tranche, 40 per cent in the second one, and 10 per cent in the last tranche. Activities included in the first tranche and their cost, as adjusted, are reflected in paragraph 45. UNDP and the country understand that this tranche distribution is expected to result in a quick reduction of the consumption growth trend and address the first commitment to freeze consumption from 2024 to 2028, with acceleration of activities to be implemented in the first tranche considered to be highly necessary.

¹² The assistance provided under the Multilateral Fund for the implementation of HPMP stages includes, in addition to the funded reductions, a budget for project coordination and monitoring, amounting to between 5 and 10 per cent of the cost of the stage, based on the size and characteristics of the country.

Impact on the climate

64. The activities proposed, including efforts to promote low-GWP alternatives, refrigerant recovery and reuse, certification of technicians, and good servicing practices, indicate that the implementation of stage I of the KIP will reduce refrigerant emissions into the atmosphere, resulting in climate benefits. A calculation of the impact on the climate of the activities in the KIP indicates that Panama will have achieved an annual emission reduction of 254,339 CO₂-eq tonnes of HFCs when the final target of stage I of the KIP is achieved, calculated as the difference between the HFC baseline and the final target set in stage I.

Sustainability of the HFC phase-down and assessment of risks

65. The implementation of stage I of the KIP in Panama is particularly complex because the country's 2022 HFC consumption is 6.5 per cent higher than its HFC baseline. Freezing HFC consumption in 2024 poses an immediate challenge, as more than one measure can reduce HFC demand in the servicing sector. The advocacy and enabling activities in the RAC sector and at end users for adopting low-GWP technology will complement the application of the HFC quota system. Each of the four strategic lines of the KIP proposal will contribute to a long-term reduction of the installed capacity of HFC-based equipment in the country.

66. The Government of Panama is committed to ensuring the sustainability of activities implemented under stage I of the KIP over time with the strengthening of regulations, including labour competency standards for servicing technicians in partnerships with INADEH. The close monitoring of all activities by the NOU and the UNDP country office will allow the implementation of risks management plans if needed.

Co-financing

67. The Government of Panama will provide in-kind co-financing through personnel, office space, and communications and supervision costs. The vocational institutions will provide their expertise for implementing the labour-competency-based certification scheme for RAC sector technicians and ensure the maintenance of received equipment and tools. INADEH will finance courses for 240 technicians from the RAC sector and 45 technicians from the MAC sector as in-kind contributions. Furthermore, the beneficiary refrigerant recovery and reclaim centres and the three commercial end users selected for the pilot projects will also provide co-financing.

2023-2025 business plan of the Multilateral Fund

68. UNDP is requesting US \$662,200, plus agency support costs, for the implementation of stage I of the KIP for Panama. The total value of US \$354,277, including agency support costs, requested for the period of 2023–2025, is US \$226,277 above the amount in the business plan.

Draft Agreement

69. A draft Agreement between the Government of Panama 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.

70. If the Executive Committee so wishes, the funds for stage I of the KIP for Panama 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.

RECOMMENDATION

71. The Executive Committee may wish to consider:

- (a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for Panama for the period 2023-2029 to reduce HFC consumption by 10 per cent of the country's baseline in 2029, in the amount of US \$662,200, plus agency support costs of US \$46,354 for UNDP, as reflected in the schedule contained in annex I of the present document;
- (b) Noting:
 - (i) That the Government of Panama 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, the 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 upon completion of the end-user technology demonstration projects in the commercial refrigeration sector 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) Approving the first tranche of stage I of the KIP for Panama, and the corresponding tranche implementation plan, in the amount of US \$331,100, plus agency support costs of US \$23,177 for UNDP; and
- (d) Requesting the Government of Panama, UNDP and the Secretariat to finalize the draft Agreement between the Government of Panama 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.

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 PANAMA**

Kigali HFC implementation plan (stage I)

Row	Particulars	2023	2024	2025	2026	2027	2028	2029	Total
1.1	Montreal Protocol reduction schedule of Annex F substances (CO ₂ -eq tonnes)	n/a	2,543,386	2,543,386	2,543,386	2,543,386	2,543,386	2,289,047	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO ₂ -eq tonnes)	n/a	2,543,386	2,543,386	2,543,386	2,543,386	2,543,386	2,289,047	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	331,100	0	0	264,880	0	0	66,620	662,200
2.2	Support costs for Lead IA (US \$)	23,177	0	0	18,542	0	0	4,635	46,354
3.1	Total agreed funding (US \$)	331,100	0	0	264,880	0	0	66,620	662,200
3.2	Total support costs (US \$)	23,177	0	0	18,542	0	0	4,635	46,354
3.3	Total agreed costs (US \$)	354,277	0	0	283,422	0	0	71,255	708,554

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)	16.11	16.11	16.11	16.11	16.11	8.05	8.05	8.05	8.05	8.05	0.00	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	16.11	16.11	16.11	16.11	16.11	8.05	8.05	8.05	0.62	0.62	0.00	n/a
2.1	Lead IA (UNDP) agreed funding (US \$)	206,800	0	0	497,612	0	0	458,838	0	0	129,250	0	1,292,500
2.2	Support costs for Lead IA (US \$)	14,476	0	0	34,833	0	0	32,119	0	0	9,047	0	90,475
3.1	Total agreed funding (US \$)	206,800	0	0	497,612	0	0	458,838	0	0	129,250	0	1,292,500
3.2	Total support costs (US \$)	14,476	0	0	34,833	0	0	32,119	0	0	9,047	0	90,475
3.3	Total agreed costs (US \$)	221,276	0	0	532,445	0	0	490,957	0	0	138,297	0	1,382,975

Annex II

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

Area of work	Stage III of the HPMP		Stage I of the KIP		Combined costs (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
Strengthening of legislation and enforcement	Ban on the import of HCFC-based equipment; inclusion of HFCs in the licensing and quota system; and adoption of the 2022 HS code system	95,000			95,000
			Training of customs and enforcement officers on the HFC phase-down legislation and import controls; and coordination meetings	15,000	15,000
			Development of at least labour competency standards for handling HCs and good practices in MAC, and of guidelines for handling refrigerants and unwanted equipment; development of a list of RAC equipment with lower GWP available in the market	30,000	30,000
			Dissemination of the Kigali Amendment and raising awareness on the use of low-GWP refrigerants	20,000	20,000
			Development of an action plan for gender mainstreaming	20,000	20,000
		<i>Subtotal</i>	95,000	<i>Subtotal</i>	85,000
Strengthening of the RAC training institutes and promoting good refrigeration practices	Distribution of 30 kits for handling HC refrigerants; training update on good servicing practices and alternative refrigerants for 40 trainers and 450 technicians; development of a unique registry of RAC workshops and technicians in the country; design and printing of good-practice materials for end users	190,000	Updating the curricula for RAC and MAC programmes in at least three vocational training institutes; development and implementation of one webinar and two presentational refresher courses on innovative, efficient, low-GWP cooling technologies for approximately 20 trainers	23,000	213,000
			Support provided to INADEH in designing, developing, and validating the curricula for new training programmes and courses for RAC and MAC technicians and development and printing of related training manuals; training of 240 RAC technicians on the safe handling of refrigerants and 45 MAC technicians on good practices in handling refrigerants	50,000	50,000
	Delivery of three tool kits and basic equipment for the laboratories of technical education centres; and inclusion in the curricula of technical education centres of additional material on low-GWP alternatives for RAC technician training	190,000	Acquisition and provision of 11 kits of equipment, tools and supplies for good practices and the safe handling of HCs to training institutions, and two kits for good practices in MAC servicing; and coordination of the digital registration process for RAC and MAC technicians and servicing workshops	73,000	263,000
	<i>Subtotal</i>	380,000	<i>Subtotal</i>	146,000	526,000

Area of work	Stage III of the HPMP		Stage I of the KIP		Combined costs (US \$)
	Activity	Cost (US \$)	Activity	Cost (US \$)	
Establishment of a RAC technician certification system	Development and approval of the national labour competency process and the methodology to evaluate technicians for certification; design of a system to train local experts to evaluate the certification tests; certification of the labour competency for 200 technicians; awareness campaign on the certification process	180,000	Training and certification of evaluators on the safe handling of HCs in the RAC sector; accreditation of assessment centers; identification of actions to support women's interest in accessing the labour competency system in the RAC sector; dissemination of the certification process to MAC and RAC technicians; and certification of technicians	50,000	230,000
	<i>Subtotal</i>	180,000	<i>Subtotal</i>	50,000	230,000
Support to end users	Awareness-raising among RAC end users and Government decision makers to promote the adoption of low-GWP alternatives	121,000	Awareness and training for health-facility end users on the adoption of low-GWP, energy-efficient alternative technologies; and support for the public procurement of RAC equipment	60,000	181,000
	Eight training workshops for 160 end users and technicians and three pilot projects to demonstrate the use of RAC equipment based on non-ODS, low-GWP refrigerants	207,000	Pilot project for the installation of low-GWP technology in two new cold rooms and three workshops on the use of low-GWP refrigerants in cold-room applications in the cold chain	86,000	293,000
			Pilot project for refrigerant containment and control of leaks at one RAC end user	45,000	45,000
	<i>Subtotal</i>	328,000	<i>Subtotal</i>	191,000	519,000
Establishment of a sustainable infrastructure for refrigerant recovery and recycling	Provision of equipment to three refrigerant recovery and recycling centres; provision of related training to 320 technicians; and design and printing of related material	192,000	Strengthening of the HFC refrigerant recovery and reclaim network	65,000	257,000
			Promotion of good practices in the handling of refrigerant gases in MAC servicing; and provision of recovery and recycling equipment, cylinders, and tools to MAC workshops	65,000	65,000
	<i>Subtotal</i>	192,000	<i>Subtotal</i>	130,000	322,000
Coordination and monitoring	Coordination and monitoring	117,500	Coordination and monitoring	60,200	177,700
	<i>Subtotal</i>	117,500	<i>Subtotal</i>	60,200	177,200
Grand total		1,292,500	Grand total	662,200	1,954,700