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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-second Meeting
Montreal, 29 May to 2 June 2023
Item 9(d) of the provisional agenda¹

PROJECT PROPOSAL: COSTA RICA

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/92/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Costa Rica

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

(II) LATEST ARTICLE 7 DATA (Annex F)	Year: 2022	718.17 mt	1,578,209 CO ₂ -eq tonnes
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (CO ₂ -eq tonnes)								Year: 2022	
Chemical	Aerosol	Foam	Fire-fighting	Refrigeration			Solvent	Other	Total sector consumption
				Manufacturing		Servicing			
				Air-conditioning	Other				
HFC-125			5,390						5,390
HFC-134a						462,476			462,476
HFC-152a	393					6,096			6,489
HFC-236fa			98						98
R-404A						436,003			436,003
R-407C						16,639			16,639
R-410A						259,163			259,163
R-507A						425,040			425,040
R-407F						4,123			4,123
R-422D						9,251			9,251
R-513A						264			264
R-448A						3,991			3,991

(IV) CONSUMPTION DATA (CO ₂ -eq tonnes)			
Baseline (average 2020-2022 HFC consumption plus 65% of HCFC baseline):	n/a	Starting point for sustained aggregate reductions:	n/a
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved:	0	Remaining:	n/a

(V) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
UNDP	HFC phase-down (CO ₂ -eq tonnes)	0.00	0.00	0.00	0.00
	Funding (US \$)	744,000	0	0	744,000

(VI) PROJECT DATA			2023	2024	2025	2026	2027-2028	2029	2030	Total
Montreal Protocol consumption limits (CO ₂ -eq tonnes) (estimated values)			n/a	1,451,498	1,451,498	1,451,498	1,451,498	1,306,348	1,306,348	n/a
Maximum allowable consumption (CO ₂ -eq tonnes) (estimated values)			n/a	1,451,498	1,451,498	1,451,498	1,451,498	1,306,348	1,306,348	n/a
Project costs requested in principle (US \$)	UNDP	Project costs	1,571,267	0	0	1,571,267	0	0	349,170	3,491,704
		Support costs	109,989	0	0	109,989	0	0	24,442	244,419
Total project costs recommended in principle (US \$)			1,571,267	0	0	1,571,267	0	0	349,170	3,491,704
Total support costs recommended in principle (US \$)			109,989	0	0	109,989	0	0	24,442	244,419
Total funds recommended in principle (US \$)			1,681,255	0	0	1,681,255	0	0	373,612	3,736,123

(VII) Request for approval of funding for the first tranche (2023)		
Implementing agency	Funds recommended (US \$)	Support costs (US \$)
UNDP	1,571,267	109,989

Secretariat's recommendation:	Individual consideration
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PROJECT DESCRIPTION

1. On behalf of the Government of Costa Rica, UNDP as the designated implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), at the amount of US \$3,491,704, plus agency support costs of US \$244,419, as originally submitted.² The implementation of stage I of the KIP will assist Costa Rica in meeting the target of 10 per cent reduction in HFC baseline consumption by 1 January 2029.

2. The first tranche of stage I of the KIP being requested at this meeting amounts to US \$1,571,267, plus agency support costs of US \$109,989, as originally submitted, for the period July 2023 to December 2026.

Background

3. Costa Rica ratified all the amendments to the Montreal Protocol, most recently the Kigali Amendment on 23 May 2018. Costa Rica has an HCFC consumption baseline of 14.1 ODP tonnes or 224.94 metric tonnes (mt) that will be completely phased out by 1 January 2030.³

Status of implementation of the HCFC phase-out management plan

4. Stage I of the HCFC phase-out management plan (HPMP) for Costa Rica was approved at the 64th meeting⁴ and revised at the 70th meeting⁵ to meet the 35 per cent reduction from the baseline by 2020, resulting in the phase out of 4.93 ODP tonnes of HCFCs and 14.00 ODP tonnes of HCFC-141b contained in imported pre-blended polyols, at a total cost of US \$1,153,523, plus agency support costs. This stage was completed by 31 December 2021 as per the terms of the Agreement.

5. Stage II of the HPMP for Costa Rica was approved at the 84th meeting⁶ for the complete phase-out of the remaining HCFC consumption by 2030, at the amount of US \$1,099,177, plus agency support costs. Stage II of the HPMP will be completed by 31 December 2031, as stipulated in the Agreement between the Government of Costa Rica and the Executive Committee.

Status of implementation of HFC-related activities

6. At the 74th meeting, Costa Rica received funding for conducting a survey on the use of alternatives to ozone-depleting substances (ODSs) (US \$70,000), completed in February 2017. At the 80th meeting, Costa Rica received funding for implementing enabling activities for HFC phase-down (US \$150,000), which were completed in March 2020. These activities assisted the country *inter alia* in ratifying the Kigali Amendment; raising awareness on HFC phase-down among stakeholders in the servicing sector and end-users; building capacity in the NOU; identifying regulatory and legislative needs for the import/export licensing system for HFCs and HFC alternatives. At the 87th meeting, Costa Rica received funding for the project preparation of the KIP, which included activities such as a survey and analysis of the sectoral distribution and consumption trends of HFCs (pure and blends); assessment of the country level needs for trainings and certification in the use of flammable refrigerants; developing and validating the overarching HFC phase-down strategy; and preparation of a communication and outreach plan related to upcoming HFC phase down commitments.

² As per the letter of 6 February 2023 from the Ministry of Energy and Environment of Costa Rica 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 64/31 document UNEP/OzL.Pro/ExCom/64/31.

⁵ Annex XIV document UNEP/OzL.Pro/ExCom/70/59.

⁶ Decision 84/62 document UNEP/OzL.Pro/ExCom/84/45.

Policy, regulatory, and institutional frameworks

7. Since 2010 Costa Rica has implemented a licensing system for the import of HCFCs and HFCs. This system is implemented by the National Ozone Unit (NOU), Bureau of Environmental Quality Management (DIGECA) for the Ministry of Environment and Energy (MINAE), in coordination with the Directorate General of Customs, Ministry of Finance and the Ministry of Foreign Trade.

8. Currently there is an effective quota system for the control of HCFCs, and a system for monitoring the import of HFCs albeit without a limit on the annual amounts imported. A new regulation to strengthen the control of HFC imports by establishing annual quotas has been designed and will come into force on 1 January 2024. DIGECA will establish the total annual HFC import quota based on the country's baseline. The quota system will include a procedure to reserve 12 per cent of the country's HFC baseline consumption to be administered by DIGECA which could be used to grant quotas to new importers or to existing importers for emergency and critical uses of HFCs in addition to those already allocated. This regulation also provides for a mechanism to carry-over remaining quotas in cases where an existing or new importer does not import the full amount of the allocated quota and defines the procedure for their distribution. These remaining quotas may also be used to replenish the reserve, when required, to guarantee the availability of HFCs in the market consistent with the compliance targets of the Montreal Protocol.

9. From January 2024, quotas will be issued at the same level as the compliance targets under the Montreal Protocol. These will be issued in an aggregated figure in CO₂-equivalent (CO₂-eq) tonnes and individual importers have the full flexibility to import the substances required as long as they do not exceed their assigned quota, thereby not exceeding the national targets for HFC consumption in CO₂-eq tonnes.

10. An online system (TICA)⁷ was established to facilitate monitoring of ODS imports and other refrigerants (including HFCs) and cross-checking with quotas issued. The Government of Costa Rica participated in the development of a mandatory technical regulation by Central American countries (RTCA 23.01.80.21) to establish the minimum energy performance standards (MEPS) for air conditioners (AC) and heat pump (mini-split and multi-split) for manufacturing, import, or sale in the region. That regulation is in the process of being approved and will be incorporated into the sustainable public procurement requirements of the country.

HFC consumption and sector distribution

11. Costa Rica does not produce and only imports HCFCs and HFCs. Based on their Article 7 data⁸ shown in table 1 below for 2022, Costa Rica consumed HFC-125⁹ (36.5 per cent in CO₂-eq tonnes), HFC-143a¹⁰ (30.4 per cent in CO₂-eq tonnes), HFC-134a (30.1 per cent CO₂-eq tonnes), HFC-32 (2.6 per cent CO₂-eq tonnes) and HFC-152a (0.4 per cent CO₂-eq tonnes).¹¹ Costa Rica also reported small amounts of HFC blends that were exported to four countries; in 2019-2022, this amounted to 28.24 mt (79,454 CO₂-eq tonnes), 61 per cent of which was in 2022; this constituted 2 per cent of the total HFC imports of the country for that year. Table 1 presents the country's HFC consumption by substance, as reported under Article 7 to the Ozone Secretariat.

⁷ Information Technology for Custom Control

⁸ Under Article 7 of the Montreal Protocol countries report HFC by pure substances whereas in the country programme (CP) implementation report HFCs are also reported by blends.

⁹ HFC-125 is mainly used as a component of refrigerant blends such as R-404A, R-407C, and R-410A among others, and has some use in fire suppression systems.

¹⁰ HFC-143a is mainly used as a component of refrigerant blends such as in R-404A and R-507A.

¹¹ In its CP data reported for 2022, presented in the project evaluation sheet, which included HFCs in both pure form and blends, Costa Rica consumed the following in terms of CO₂-eq tonnes: HFC-134a (28.4 per cent), R-404A (26.8 per cent), R-507A (26.1 per cent) and R-410A (15.9 per cent), R-407C (1 per cent), R-422D (0.6 per cent), HFC-152a (0.4 per cent), HFC-125 (0.3 per cent), R-407F (0.3 per cent), and R-448A (0.2 per cent).

Table 1. HFC consumption in the Costa Rica (2019-2022 Article 7 data)

HFC	GWP	2019	2020	2021	2022	Share of HFC consumption in 2022 (%)
Metric tonnes						
HFC-32	675	58.42	38.51	33.38	62.22	8.7
HFC-125	3,500	116.01	109.67	95.24	164.50	22.9
HFC-134a	1,430	256.03	241.81	209.62	331.88	46.2
HFC-143a	4,470	62.18	76.17	64.75	107.22	14.9
HFC-152a	124	32.76	23.34	52.25	52.33	7.3
HFC-227ea	3,220	0.8	0.48	0.21	0.00	0
HFC-236fa	9,810	0.00	0.00	0.14	0.01	0
HFC-23	14,800	0.19	0.00	0.11	0.00	0
Total (mt)	n/a	526.4	489.98	455.70	718.17	100
CO₂-eq tonnes						
HFC-32	675	39,435	25,997	22,533	42,001	2.6
HFC-125	3,500	406,041	383,851	333,337	575,760	36.5
HFC-134a	1,430	366,127	345,787	299,758	474,587	30.1
HFC-143a	4,470	277,955	340,461	289,422	479,273	30.4
HFC-152a	124	4,063	2,894	6,479	6,489	0.4
HFC-227ea	3,220	2,576	1,546	676	0	0
HFC-236fa	9,810	0	0	1,373	98	0
HFC-23	14,800	2,797	0	1,628	0	0
Total (CO₂-eq tonnes)	n/a	1,098,992	1,100,536	955,206	1,578,209	100

12. The HFC consumption of Costa Rica decreased in 2020 and 2021 due to the pandemic and showed an increase in 2022, which was 58 per cent in mt and 65 per cent in CO₂-eq tonnes higher than in 2021. While HFC-based equipment installed had been increasing due to the ban on imports of HCFC-22-based equipment from January 2020 and the relatively slow introduction of non-HFC alternatives in the country, the reasons cited for the increased consumption had to do with a swift economic recovery in 2022. Specifically, UNDP explained that the prices of refrigerants and transport costs resulted in a decrease in demand in the pandemic years as servicing maintenance was not completed, particularly in the tourism sector which was severely impacted. In 2022, the price of refrigerants decreased by 60 per cent and tourism and other sectors recovered causing a steep increase in demand and in imports.

Country programme implementation report

13. The Government of Costa Rica reported HFC sector consumption data under the 2022 CP implementation report that is slightly different from the data reported under Article 7 of the Montreal Protocol as the latter included export and destruction amounts which had not been deducted from the reported CP data.

Sector distribution of HFCs

14. Costa Rica consumes most HFCs in the refrigeration and air-conditioning (RAC) sector and some small amounts in firefighting, aerosols, foaming agents (PU foams) and as solvents and process agents. The majority of HFC consumption is in the servicing sector with some consumption in the local assembly and installation sector (cold rooms, large commercial refrigeration, etc.). The Government had reported that based on the certificates of good servicing practices issued from the training courses, there are at least 2,000 RAC servicing technicians in the country.

15. In a 2022 projection of sectoral HFC use based on a top-down approach for data collection provided by UNDP, HFCs were found to be predominantly used in the mobile air-conditioning (MAC) (HFC-134a),

domestic, commercial stand-alone, and centralized refrigeration systems (HFC-134a, R-404A, R-410A and R-507A), domestic and commercial air-conditioning (R-410A), refrigerated transport (HFC-134a and R-404A), and small uses in firefighting (HFC-125) and other uses (HFC-152a) as shown in table 2. A brief description of consumption in the main subsectors is presented below.

Table 2. Sectoral HFC consumption in firefighting and RAC servicing sector for 2022 in Costa Rica*

Sector	HFC-152a	HFC-125	HFC-134a	R-410A	R-407C	R-507A	R-404A	R-422D	R-513A	R-452A	Total	Share of consumption (%)
Metric tonnes												
Firefighting subsector												
Firefighting	0.00	1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54	0
<i>Subtotal firefighting subsector</i>	<i>0.00</i>	<i>1.54</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	1.54	0
RAC subsectors												
Domestic refrigeration	0.00	0.00	15.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.27	2
Commercial refrigeration	0.00	0.00	36.13	0.24	0.00	0.10	171.23	0.00	0.00	0.00	207.70	27
Industrial refrigeration	0.00	0.00	2.10	0.01	0.00	0.01	9.97	0.00	0.00	0.00	12.09	2
Residential AC	0.00	0.00	0.42	7.89	0.00	0.00	0.00	0.00	0.00	0.00	8.31	1
Commercial AC	0.00	0.00	3.98	131.49	2.22	0.65	0.12	0.03	0.03	0.00	138.52	18
Industrial AC	0.00	0.00	1.90	7.44	0.65	0.69	0.13	0.03	0.03	0.00	10.86	1
Transport refrigeration	0.00	0.00	55.53	0.13	0.00	1.45	28.31	0.00	0.00	0.13	85.55	11
Mobile AC (MAC)	0.00	0.00	231.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	231.69	30
<i>Subtotal RAC</i>	<i>0.00</i>	<i>0.00</i>	<i>347.01</i>	<i>147.20</i>	<i>2.87</i>	<i>2.90</i>	<i>209.75</i>	<i>0.06</i>	<i>0.06</i>	<i>0.13</i>	709.98	93
Other subsectors												
Aerosols and solvents	52.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7
<i>Subtotal other subsector</i>	<i>52.33</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	0.00	7
Total (mt)	52.33	1.54	347.01	147.20	2.87	2.90	209.75	0.06	0.06	0.13	763.85	100
CO₂-eq tonnes												
Firefighting subsector												
Firefighting	0	5,390	0	0	0	0	0	0	0	0	5,390	0
<i>Subtotal firefighting subsector</i>	<i>0</i>	<i>5,390</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	5,390	0
RAC subsectors												
Domestic refrigeration	0	0	21,830	0	0	0	0	0	0	0	21,830	1
Commercial refrigeration	0	0	51,660	497	0	410	671,568	0	0	0	724,136	44
Industrial refrigeration	0	0	3,007	29	0	24	39,087	0	0	0	42,147	3
Residential AC	0	0	604.89	16,470	0	0	0	0	0	0	17,075	1
Commercial AC	0	0	5,691	274,541	3,940	2,606	467	82	17	0	287,344	17

Sector	HFC-152a	HFC-125	HFC-134a	R-410A	R-407C	R-507A	R-404A	R-422D	R-513A	R-452A	Total	Share of consumption (%)
Industrial AC	0	0	2,710	15,535	1,157	2,750	490	85	18	0	22,743	1
Transport refrigeration	0	0	79,404	276	0	5,766	111,024	0	0	282	196,752	12
Mobile AC (MAC)	0	0	331,318	0	0	0	0	0	0	0	331,318	20
<i>Subtotal RAC</i>	0	0	496,226	307,347	5,097	11,557	822,636	166	35	282	1,643,346	99
Other subsectors												
Aerosols and solvents	6,489	0	0	0	0	0	0	0	0	0	6,489	0
<i>Subtotal other subsector</i>	6,489	0	0	0	0	0	0	0	0	0	6,489	0
Total (CO₂-eq tonnes)	6,489	5,390	496,226	307,347	5,097	11,557	822,636	166	35	282	1,655,225	100

* Data was obtained through a model based on equipment imports in 2016.

Firefighting applications

16. In Costa Rica, the substances consumed in the firefighting subsector are less than 1 per cent of the total HFC sectoral consumption in both mt and CO₂-eq tonnes. HFC-125 is the refrigerant consumed the most in Costa Rica in servicing firefighting applications. Some small quantities of HFC-227ea, or HFC-236fa are occasionally brought in for use in portable fire extinguishers, amounting to a quarter of the imports for this subsector between 2018 and 2022.

Refrigeration and air-conditioning subsectors

Domestic, commercial, industrial and transport refrigeration

17. Domestic refrigeration applications (2 per cent in mt and 1 per cent in CO₂-eq tonnes of the total sectoral consumption) predominantly use HFC-134a for household refrigerators and freezers; domestic refrigeration equipment using R-600a has shown steady growth over the last decade and accounts currently for about 27 per cent of the inventory of equipment. Inadequate servicing practices have been observed in the service sector for domestic refrigerators with R-600a, as some technicians conduct substitutions of R-600a with HFC-134a which can cause technological and environmental damage and reduce energy efficiency. Training in good practices for servicing R-600a-based equipment has been prioritized in the proposed activities.

18. The commercial refrigeration subsector is the largest HFC consumer among the subsectors in terms of CO₂-eq tonnes and the second largest in mt (i.e., HFC-134a, R-404A, R-410A and R-507A). The subsector comprises more than 57,900 enterprises in tourism, construction, health, services, finance, communications and transport. The commercial refrigeration subsector consists of 344,918 units of stand-alone refrigeration equipment and 829 centralized systems units. Stand-alone equipment in the commercial subsector accounts for 2 per cent of the HFC consumption in both mt and in CO₂-eq tonnes and uses mainly HFC-134a, and some smaller quantities of R-404A, R-410A and R-507A. For centralized systems although the number of equipment is not high relative to stand-alone equipment the servicing demand amounts to 25 per cent in mt and 42 per cent in CO₂-eq tonnes of the 2022 sectoral consumption as it uses primarily R-404A (with a high-GWP of 3,922) and to a lesser extent HFC-134a. The industrial refrigeration subsector also relies on stand-alone refrigeration units and centralized systems and is made up of more than 10,188 enterprises in export-agriculture, food processing and storage, and manufacturing of

electronic components, medical devices, and textiles. The consumption in this subsector amounts to 3 per cent in CO₂-eq tonnes and 2 per cent in mt primarily from centralized systems.

19. The refrigerated transport subsector consists of refrigerated containers (HFC-134a and R-404A) used for import and export needs and refrigerated trucks (R-404A, HFC-134a, R-507C, R-410A, and R-452A) which are used domestically. The transport refrigeration subsector consumes 11 per cent in mt and 12 per cent in CO₂-eq tonnes of the sectoral consumption of HFCs in the country for 2022.

Residential, commercial and industrial air-conditioning

20. Less than 5 per cent of households in Costa Rica have AC. Existing residential AC equipment still relies predominantly on HCFC-22 but there is increasing consumption of R-410A and to a lesser extent HFC-134a.¹² The HFCs consumed in this subsector amount to 1 per cent of the total sectoral consumption in 2022 in terms of both mt and CO₂-eq tonnes.

21. Commercial AC is the third largest subsector in terms of its consumption of HFCs in 2022 in both mt and CO₂-eq tonnes. The subsector uses AC equipment and chillers in enterprises in the tourism, construction, health, services, finance, communications, supermarket and public sector and accounts for 18 per cent of the total HFC consumption for 2022 in mt and 17 per cent in CO₂-eq tonnes. Refrigerants used in this subsector are predominantly R-410A followed by HCFC-22, HFC-134a and R-407C and some small quantities of R-507A, R-404A, R-422D and R-513A are consumed in chillers. In the industrial subsector, the main users of AC consist of enterprises manufacturing electronics and in biotechnology. This subsector consumed 1 per cent in mt and 1 per cent in CO₂-eq tonnes of HFCs in 2022 in AC equipment and chillers.

Mobile air-conditioning (MAC) servicing

22. This subsector is the largest HFC consumer among the subsectors in mt and the second largest in CO₂-eq tonnes and was not assisted during the HPMP. It accounts for roughly 30 per cent of HFCs in mt and 20 per cent in CO₂-eq tonnes of the 2022 sectoral consumption and uses only HFC-134a. The dependence in the automotive sector on HFC-134a, is expected to continue for some time as only a negligible quantity of alternatives with R-1234yf are currently being imported; it is therefore necessary to ensure good servicing practices and recovery, recycling, and reuse of refrigerants.

Local installation and assembly

23. Costa Rica has a local assembly and installation subsector where RAC equipment is charged onsite (cold rooms, large commercial refrigeration, etc.). No HFC consumption data was provided for this subsector, but it is acknowledged that their needs and characteristics are different from those of the servicing sector and that reductions in this sector will contribute to meeting the 10 per cent reduction. Activities for this subsector have been considered in the strategies and activities proposed in stage I of the KIP.

Other subsectors

Aerosols and solvents

24. There is also use of HFC-152a as a process agent in glass manufacturing, as a cleaning solvent for gum removal, and as aerosol control sprays for pet training. While there are imports of HFC-152a, and it ranks fifth in terms of consumption in mt based on the sectoral consumption model provided by UNDP,

¹² HFC-134a is used in small portable AC units in Costa Rica.

given its low-GWP (of 124), its total consumption in CO₂-eq tonnes is less than 1 per cent and thus it is not prioritized in stage I of the KIP.

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

25. Stage I of the KIP in Costa Rica aims to meet the freeze in 2024 and the 10 per cent reduction from its HFC baseline consumption by 2029 through four strategic components which include reduction in the demand for high-GWP HFCs, strengthening national capacities in the safe use of low-GWP refrigerants and in new RAC technologies, implementing projects aimed at reducing HFC emissions as well as improving life-cycle management of the refrigerants, and developing an enabling environment to promote and sustain the use of natural refrigerants and low-GWP alternatives through policies and regulations, economic incentives and standards. Stage I of the KIP is proposed to be implemented from 2023-2030 and will be implemented simultaneously with the HPMP until 2030.

Estimated HFC baseline and proposed HFC reductions during stage I

26. The Government of the Costa Rica reported HFC consumption for 2020 to 2022 under Article 7. By adding 65 per cent of the HCFC baseline (in CO₂-eq tonnes) to the average HFC consumption in 2020-2022, the estimated HFC baseline is 1,451,498 CO₂-eq tonnes¹³, as shown in table 3.

Table 3. Estimated HFC baseline for the Costa Rica (CO₂-eq tonnes)

Baseline component	2020	2021	2022	2020-2022 average
HFC consumption	1,100,536	955,206	1,578,209	1,211,317
HCFC baseline	369,509 x 65%			240,181
HFC estimated baseline				1,451,498

27. The Government of the Costa Rica and UNDP forecasted HFC consumption in an unconstrained scenario based on an annual average growth rate of 2 per cent and calculated the level of HFC reductions required to ensure compliance with the Montreal Protocol at different points in time. The forecast of HFC consumption in an unconstrained scenario is presented in table 4 and demonstrates that Costa Rica will be at risk of potential non-compliance from 2024 and subsequent years without any actions to reduce growth.

Table 4. Unconstrained scenario of HFC consumption forecast at 2 per cent growth and required reductions (CO₂-eq tonnes)

Scenario	2022	2023	2024	2025	2026	2027	2028	2029	2030
HFC consumption growing at an annual rate of 2 per cent ¹⁴	1,578,209	1,609,773	1,641,969	1,674,808	1,708,304	1,742,470	1,777,320	1,812,866	1,849,123
HFCs phased in from HCFC phase-out ¹⁵	n/a	22,297	22,297	22,297	22,297	22,297	22,297	22,297	22,297

¹³ While the country had submitted HFC consumption for the baseline years, the Ozone Secretariat had not yet established the official calculated HFC baseline for the country, as noted in the data presented on the website; the figure presented is calculated based on the average HFC consumption 2020-2022 plus 65 per cent of the HCFC baseline, in CO₂-eq tonnes.

¹⁴ An annual increase of 2 per cent of HFCs is a conservative growth scenario which was submitted by UNDP.

¹⁵ Estimated HFC consumption phased in from the HCFCs phased out is assuming that the entire 129 mt of remaining HCFC-22 consumption to be phased out under stage II of the HPMP is primarily in the AC subsectors (residential, commercial and industrial) and replaced by HFCs (1.29 mt replaced by HFC-134a and 127.26 mt replaced by R-410A in proportion to the current distribution of these substances in the AC subsectors). This corresponds to an introduction of 267,567 CO₂-eq tonnes of HFCs between 2019 and 2030 (22,297 CO₂-eq tonnes each year). Considering the level of HFC consumption in the country, the additional consumption arising from the remaining HCFC-22 being phased out is low (1 per cent of the 2022 HFC consumption).

Scenario	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total estimated HFC consumption with unconstrained demand of 2 per cent	1,578,209	1,632,070	1,664,266	1,697,105	1,730,601	1,764,767	1,799,617	1,835,163	1,871,420
Montreal Protocol limit according to the baseline	n/a	n/a	1,451,498	1,451,498	1,451,498	1,451,498	1,451,498	1,306,348	1,306,348
Required HFC reductions (under a scenario of 2 per cent growth rate in consumption)	n/a	n/a	212,768	245,607	279,103	313,269	348,119	528,815	565,072

28. Based on the analysis presented in table 4, in an unconstrained scenario, Costa Rica would need to undertake activities to reduce HFC consumption by 212,768 CO₂-eq tonnes in 2024 to ensure compliance with the HFC consumption target. Table 4 also shows that Costa Rica's 2022 HFC consumption is 8 per cent above the estimated baseline, emphasizing urgent actions to guarantee reductions to meet compliance.

29. Stage I of the KIP proposes to reduce HFC consumption by 10 per cent in 2029. This will require an 8 per cent reduction from their 2022 HFC consumption for the country to meet the freeze in 2024 followed by a 17 per cent reduction from their 2022 HFC consumption in order to meet the 10 per cent reduction from the baseline in 2029 as per the Kigali Amendment.

Strategy components

30. Costa Rica's overarching strategy is based on the principles of supporting the safe introduction, installation, and maintenance of new energy-efficient equipment based on natural refrigerants, promoting early retirement of HFC-based equipment, and introducing activities in the RAC sector that would reduce the servicing demand for HFC refrigerants (i.e., district cooling, passive cooling, etc.). The strategic approach for stage I of the KIP will include the introduction of low-GWP RAC equipment to Costa Rica focusing on those applications that currently use high-GWP HFCs. The first steps will involve developing standards and regulations for flammable, toxic and high-pressure refrigerants; increasing the capacity of RAC technicians; and an awareness campaign for all the main stakeholders (importers of RAC equipment and refrigerants, end-users, and government entities); and reductions in the commercial RAC sector which will be instrumental to complying with the freeze in 2024 and the 10 per cent reduction in 2029. The projects have been divided into four main categories with related project components and activities, the respective costs of which are presented below in table 5.

Table 5. Activities to be implemented in stage I of the KIP

Project component	Planned activities	Cost (US \$)
<i>1. Strategy to support an enabling environment that will promote the sustainable use of natural refrigerants and other low- GWP alternatives</i>		
Programme for the creation of the legal framework and inter-institutional coordination for the implementation of the Kigali Amendment	<ul style="list-style-type: none"> Establish a coordinating mechanism with institutions and authorities involved in the implementation of the KIP to include stakeholders not previously involved in national plans under the Montreal Protocol; organize workshops on the Montreal Protocol and the Kigali Amendment; Strengthen the HFC regulatory framework through a review of regulations and prepare amendments including introducing quotas for the import of HFCs in consultation with stakeholders; and Develop technical standards for the safe use of natural refrigerants and to prevent the release of HFCs into the environment throughout their life cycle and printing 500 leaflets for dissemination. 	166,000
Programme to increase the capacity of the	<ul style="list-style-type: none"> Build capacity of customs officers in HFC trade control; review and improve the procedures of the licensing system and imminent quota system, improve the Customs' Registry System, and implement harmonized customs (HS) 	77,000

Project component	Planned activities	Cost (US \$)
national customs in the control of HFC trade	codes updates; and <ul style="list-style-type: none"> • Customs officer training programme including an international consultant to lead four workshops for customs officers and brokers on the updated HS codes and control of HFCs; and an international workshop to exchange experiences with other countries in the region. 	
Program to promote the sustainable use of RAC technologies that use low-GWP refrigerants; not-in-kind (NIK) technologies ¹⁶ and more energy efficient equipment	<ul style="list-style-type: none"> • Technical assistance for the cold chain sectors to promote RAC systems with low-GWP alternatives; assessment of HFC consumption for the sector and development of a national strategy for measures to reduce HFCs in food storage and distribution; • Feasibility study for a district cooling project to include analysis of energy supply, legal and tariff condition, costs and benefits, physical and logistical characteristics for implementation, type of thermal energy generation and distribution, total load and demand points, conditions for outsourcing of cooling or heating, market analysis, depreciation analysis of equipment; and • Preparation of initial investment budget for district cooling and environmental impact assessment. 	265,000
Awareness-raising programme on the implementation of the Kigali Amendment	<ul style="list-style-type: none"> • Awareness-raising programme to disseminate actions for Kigali Amendment implementation, HFC control and regulatory updates; including a communications campaign and four workshops on the national plan for HFC phase-down; and • Analysis of the gender requirements for the KIP implementation and identifying needs and priorities of women and men; design, implementation, promotion and monitoring of a gender action plan. 	120,500
<i>2. Strategy to strengthen national capacities for the safe use of natural refrigerants and new RAC technologies</i>		
Program for the safe use of natural alternatives to HFCs in the RAC sector and improvement of national capacities in the maintenance of RAC systems	<ul style="list-style-type: none"> • Strengthening education and technical training in Costa Rica by identifying needs and procuring equipment¹⁷ for distribution to eight technical schools and follow-up monitoring of use; • Review RAC training curriculum and the adjustments needed for the implementation of the Kigali Amendment; • Train the trainers' programme for a total of 25 trainers on updated curriculum including new regulations on high-GWP refrigerants, good practices for installation, maintenance and disposal of high-GWP equipment, low-GWP alternatives, good practices for the use of natural refrigerants including disposal, good practices for flammable refrigerants in AC equipment, and electronic controls for more energy efficiency in new RAC technologies; • Establish a demonstration of a didactic refrigeration module with transcritical CO₂ system in the National Learning Institute (INA); coordinate the procurement and installation of equipment and provide training; • Develop a training programme for RAC technicians on transcritical CO₂ systems at INA; • Implement INA training programme for 10 trainers on transcritical CO₂ systems; and • Four annual activities to promote the certification process for RAC technicians; at least four training sessions for assessors; and provide tools¹⁸ to 100 RAC technicians in the domestic and commercial refrigeration servicing sector. 	1,059,360

¹⁶ The term of not-in-kind (NIK) cooling technologies refers to any alternative cooling systems other than the vapor compression cooling systems that are the most commercially dominant today.

¹⁷ To be determined but expected to include R-290 AC training units; R-600a domestic refrigeration units with double door and inverter system; R-290 medium temperature vertical commercial refrigeration units of various sizes; R-290 cold room unit; and transcritical CO₂ demonstration systems for refrigerated display cabinets.

¹⁸ Including vacuum pumps; manifolds; sets of hose and ball valves for hydrocarbon (HC); scales; leak detectors and digital vacuum gauges.

Project component	Planned activities	Cost (US \$)
<i>3. Strategy for the reduction in the demand for high-GWP HFCs</i>		
End-user technical assistance programme to promote the use of alternative refrigerants to HFCs in the RAC sector	<ul style="list-style-type: none"> • Awareness-raising project to encourage end-users to adopt new, energy-efficient, and low-GWP technologies including two workshops to identify relevant end-users in the RAC sector and five regional workshops to identify potential pilot projects; • Programme for the identification of demonstration projects for the use of heat pumps as an alternative technology to the use of HFCs including organizing two workshops for selected subsectors on alternative technologies such as heat pumps and identify two interested end-users, conduct two feasibility studies with selected end-users to inform potential demonstration projects in the next stage of the KIP; and • Pilot project for the adoption of low-GWP, energy efficient refrigerants in selected supermarkets; design and implementation of pilot project using transcritical CO₂ technology; and the preparation and dissemination of an assessment report. 	499,050
Support for the early retirement of inefficient RAC appliances programme	<ul style="list-style-type: none"> • Establish five scrapping centres to support the early retirement of inefficient RAC appliances; train personnel in recovery, storage, management, and registry of recovered refrigerants; provision of two sets of basic recovery tools for each centre; meetings with stakeholders to obtain support in promoting energy efficiency and a refrigerant recovery project; design of a system for registry of retired equipment and monitoring; development of a manual, and certification of the recovery and disposal process. 	95,800
Program for monitoring the use of HFCs as fire extinguishing agents	<ul style="list-style-type: none"> • Technical assistance to the subsector to develop an inventory of companies that import, sell, use, install and recharge HFC-based fire control equipment and systems; and • Carry out awareness-raising activities to promote good practices in maintaining and recharging portable fire extinguishers; and develop and print a good practice booklet for the maintenance of HFC-based portable fire extinguishers. 	40,000
<i>4. Strategy for the reduction of emissions and improving the life cycle management of HFCs</i>		
Refrigerant conservation program in RAC equipment and systems	<ul style="list-style-type: none"> • A full assessment of the impact of good refrigeration practices in RAC servicing at end-user level, the preparation of a report, and a national seminar to disseminate results; and • Project to identify 80 high-volume servicing and maintenance workshops for MAC equipment throughout the country; 16 training workshops for 240 technicians on good practices in the management of refrigerants in the servicing of MAC equipment. 	184,200
Management program for refrigerants in recovery and recycling (R&R) and reclaim network	<ul style="list-style-type: none"> • Support HFC R&R network in Costa Rica including establishment and provision of equipment to four large volume R&R centres¹⁹ and one reclamation centre²⁰; 20 teams of RAC technicians supplied with equipment and tools to strengthen R&R practices²¹; establishment of a national R&R network; and an awareness campaign; • Improve R&R capacity in the MAC sector including supporting 80 high-volume workshops with tools and equipment²² and establish a nationwide network for R&R in MAC systems and monitor the operation of the R&R network in the MAC sector and the amount of HFC-134a 	667,366

¹⁹ Recovery system with ball valve hoses, 12.5 lb, 30 lb and 100 lb cylinders, vacuum pump, scales, recycling system with ball valve and hoses, manifolds for R134a, R404A and R410A, refrigerant identifier, among other tools.

²⁰ Recovery machine, reclaiming machine, refrigerant pump, refrigerant identifier, vacuum pump, 12.5 lb, 30 lb and 100 lb cylinders scales, two-way gauges, humidity equipment, chromatograph, among other tools.

²¹ Recovery system with ball valve hoses, 12.5 lb, and 30 lb cylinders, vacuum pump, scales, manifolds for R-134a, R404A and R410A, leak detectors, multimeters with clamps, oxygen and acetylene welding set, various tools, toolboxes, and safety equipment.

²² Including portable refrigerant gas recovery unit for mobile AC use; 30 lb and 123 lb cylinders, leak detectors, vacuum pumps and vacuum meter, among other tools and equipment.

Project component	Planned activities	Cost (US \$)
	refrigerant recovered in each of the MAC service workshops including four site visits per year to each workshop; and <ul style="list-style-type: none"> • Evaluation of the expansion of national capacities in the destruction of refrigerants and other products with HCFCs and HFCs including the development of field measurement methodology and laboratory analysis; fields test, report and dissemination. 	
Subtotal		3,174,276
Project monitoring	<ul style="list-style-type: none"> • NOU monitoring and implementation activities including US \$250,000 on national consultants; US \$40,428 for travel for monitoring; US \$15,000 for meetings with stakeholders and US \$12,000, for preparation of reports. 	317,428
Grand Total		3,491,704

Project implementation and monitoring unit (PMU)

31. The monitoring activities will build upon the mechanisms established under the implementation of the HPMP, where the NOU monitors activities, reports progress, and collaborates with stakeholders to phase out HFCs with the assistance of UNDP (US \$317,428) calculated as 10 per cent of the project cost, as noted in the table above.

Total cost of stage I of the Kigali HFC implementation plan

32. The Government of Costa Rica proposes to implement the KIP in stages, with stage I going until 2030 simultaneously with the HPMP. The budget for stage I was proposed at US \$3,491,704. The funding request is costed for each activity at the best estimate based on Costa Rica's experience implementing the same or similar activities. The costing is not linked to a consumption level or reduction, as cost guidelines were not available at the time of preparation of this request.

Simultaneous implementation of HCFC phase-out and HFC phase-down

33. The Government of Costa Rica included in its submission a section related to the simultaneous implementation of the HPMP and the KIP. Stage II of the HPMP was approved at the 84th meeting and the second tranche was approved at the 90th meeting. All remaining HCFC consumption is in the RAC servicing sector and the main activities are directed towards the training of technicians in good refrigeration practices, strengthening the reclamation, recycling and reuse (R&R) network, training on safety measure for hydrocarbon (HC) refrigerants, certification of technicians, and strengthening of the training institutions. These activities will be implemented simultaneously with stage I of the KIP.

34. UNDP also reported that there are key differences between activities in the HPMP and what is proposed for the KIP. HFC refrigerants include a significant number of pure substances and blends which greatly increases the complexity in servicing and R&R operations, as well as in good practices in refrigeration courses, and in the type of equipment and substances the technicians need training on. All low-GWP alternatives, like HC, CO₂ and NH₃ that are proposed to be introduced in Costa Rica have higher flammability, pressure and/or toxicity that require special attention. This means special measures must be taken throughout the lifetime of the refrigerant (transport, storage, charging, maintenance of equipment, recovery, and final disposal). The RAC technicians must be trained in the use of natural refrigerants, energy efficiency, new technology (including technology with internet connectivity), rapid fault detection, and test diagnostics in real time. These issues were not previously addressed in the standard courses in good refrigeration practices under the HPMP. Thus, the training under the KIP will cover more topics, be longer in duration and require specialized training equipment.

*Gender policy implementation*²³

35. A total of US \$60,500 (under two per cent of the total requested funds) has been requested to assist the NOU in implementing the gender mainstreaming policy of the Fund as part of the KIP. The funding will be used to carry out a gender analysis, collect information and develop an action plan for the necessary actions to advance towards gender equality in the RAC sector; to promote the inclusion of excluded groups in society in the RAC sector (including but not limited to gender); and to follow-up on KIP gender indicators according to guidelines established by the Multilateral Fund.

Activities planned for the first tranche of stage I

36. The first funding tranche of stage I of the KIP in the total amount of US \$1,571,267 will be implemented between June 2023 and December 2026 and will include the activities outlined below:

- (a) *Strategy to support an enabling environment that will promote the sustainable use of natural refrigerants and other low- GWP alternatives* (US \$235,025 in total) comprising:
 - (i) Establishing a coordinating mechanism with institutions and authorities involved in the implementation of the KIP to include stakeholders not previously involved in national plans under the Montreal Protocol; hire an international consultant for two stakeholder consultation workshops on the Montreal Protocol and the KIP implementation with relevant institutes and authorities; a review of regulations and preparation of amendments including introducing quotas for the import of HFCs in consultation with stakeholders and identify other legal measures to meet the targets under the Kigali Amendment; revision and approval of standards and national procedures for the safety and use of flammable refrigerants (US \$119,025);
 - (ii) Two training workshops to train 40 customs officers and two training courses for brokers, importers and other authorities; update HS codes including two workshops on the updated codes; one international workshop for customs to exchange lessons-learned with other countries in Latin America on the trade and control of HFCs (US \$36,000);
 - (iii) Technical assistance to promote alternatives with low-GWP in the cold chain through an assessment of the HFC consumption during the storage and distribution in the country's food cold chain (US \$30,000); and
 - (iv) Awareness raising and gender mainstreaming: two information workshops on the KIP and the control of HFCs in Costa Rica for main stakeholders and end-users; a specialized consultancy for the communication campaigns targeting key stakeholders, end-users and the public; consultancy for the design, implementation, and monitoring of a gender action plan and gender analysis (US \$50,000).
- (b) *Strategy to strengthen national capacities for the safe use of natural refrigerants and new RAC technologies* (US \$501,424 in total) comprising:

²³ In line with decision 84/92(d), decision 90/48(c) encouraged bilateral and implementing agencies to continue ensuring that the operational gender mainstreaming policy was applied to all projects, taking into consideration the specific activities presented in table 2 of document UNEP/OzL.Pro/ExCom/90/37.

- (i) Needs assessment to strengthen the Professional Technical Colleges (PTC); procurement of training equipment²⁴; evaluation of the training curriculum for good practices and safe handling of refrigerants and identification of other training needs; train the trainer's programme for 20 trainers (US \$233,000);
 - (ii) Identify and design the requirements for establishing the transcritical CO₂ training centre; procurement of didactic refrigeration system with transcritical CO₂; develop a specialized training programme for RAC technicians on transcritical CO₂; conduct a train the trainer's programme for 20 trainers at the centre (US \$98,424); and
 - (iii) Review, consult, validate and update national standards for labour certification for RAC sector; support development of the process for the assessment of labour competences for the safe use of low-GWP refrigerants; formulation of strategies to maintain quality in the RAC technician certification process; activities and workshops to promote the certification process (US \$170,000).
- (c) *Strategy for the reduction in the demand for high-GWP HFCs* (US \$328,000 in total) comprising:
- (i) Workshop to consult and identify potential beneficiaries for the pilot demonstration project on transcritical CO₂ refrigeration systems; design and installation for the pilot project to adopt low-GWP and energy efficient alternatives in the supermarket sector and results evaluation and dissemination; two workshops for end-users to promote the adoption of energy-efficient and low-GWP technologies (US \$270,000);
 - (ii) Technical assistance to design the programme to support the early retirement of inefficient RAC appliances including registry development, operation manual, training design, and process certification; deliver two training courses for reclamation personnel; public promotion activities (US \$40,000); and
 - (iii) Assistance to the firefighting sector to develop an inventory of companies that import, sell, use, install and recharge HFC-based fire control equipment and systems; promote best practices in maintaining and recharging portable fire extinguishers; develop and print a good practice booklet; and carry out awareness-raising activities and workshops (US \$18,000).
- (d) *Strategy for the reduction of emissions and improving the life cycle management of HFCs* (US \$363,975 in total) comprising:
- (i) Selection of end-users, design and implementation of an assessment of the impact of good refrigeration practices in RAC servicing at end-user level; identification and selection of high-volume MAC service workshops; develop training content and materials and deliver eight training courses in good servicing practices for a total of 80 MAC service workshops (US \$88,000);
 - (ii) Establish four recovery and recycling (R&R) centres and identify the equipment requirements; training support for 20 teams of technicians at these centres; procure,

²⁴ Including 16, R-290 AC units; 16, R-600a domestic refrigeration units with double door and inverter system; 16, R-290 medium temperature vertical commercial refrigeration unit; 16, R-290 low temperature horizontal commercial refrigeration units; three R-290 cold rooms; and one transcritical CO₂ demonstrative systems for display cabinets in supermarkets.

deliver and commissioning of the equipment/tool needs for two R&R centres²⁵ and a reclamation centre²⁶ and technical support for these 10 teams of technicians; information and awareness campaign on refrigerant recovery, recycling and reclamation (US \$139,000);

- (iii) Identify the equipment needs of 30 MAC servicing workshops to support recovery and recycling in the MAC sector; procure, deliver and commissioning of MAC good service practice kits²⁷; follow up and monitoring of R&R activity in the MAC sector (US \$130,000); and
 - (iv) Evaluation of national capacities in the destruction of refrigerants and other products with HCFCs and HFCs including the development of field measurement methodology and laboratory analysis (US \$6,975).
- (e) Project coordination and monitoring at the amount of US \$142,843: including six annual project reports; six meetings with stakeholders; three follow up tranche reports; and monitoring of tranche implementation.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

37. In the absence of cost guidelines for HFC phase-down, the Secretariat reviewed stage I of the KIP considering existing policies and guidelines of the Multilateral Fund, stage II of the HPMP, and the 2023-2025 business plan of the Multilateral Fund. While the Secretariat reviewed and discussed key elements of the proposal, it was unable to estimate funding levels for stage I of the KIP as this requires further consideration by the Executive Committee in line with the discussion of cost guidelines for HFC phase-down in the servicing sector. Furthermore, decision 91/38 allows the consideration of stage I of the KIPs on a case-by-case basis and without setting a precedent for the cost guidelines for stage I of KIPs.

Overarching strategy for stage I of the KIP

Proposed HFC reductions

38. The Government of Costa Rica, based on its 2020-2022 consumption reported under Article 7 and HCFC baseline, has an estimated HFC baseline of 1,451,498 CO₂-eq tonnes. Because HFC consumption in 2022 is above the baseline, Costa Rica proposes to reduce 17 per cent of the 2022 HFC consumption in CO₂-eq (271,861 CO₂-eq tonnes²⁸) in order to meet the freeze in HFC consumption at the baseline in 2024 and the subsequent 10 per cent reduction from the baseline in 2029. UNDP explained that these additional reductions are necessary for the country to meet these compliance targets since the reported consumption of HFCs in 2022 is already higher than the estimated HFC baseline of the country, in CO₂-eq tonnes.

39. The main approach to meet these reductions will be to reduce HFC consumption in the servicing sector from RAC applications through activities supporting the safe introduction, installation, and maintenance of new energy-efficient equipment based on natural refrigerants, promoting early retirement of HFC-based equipment, and introducing changes in the RAC sector (i.e., district cooling, etc.) to reduce

²⁵ Recovery system with ball valve hoses, 12.5 lb, 30 lb and 100 lb cylinders, vacuum pump, scales, recycling system with ball valve and hoses, manifolds for R134a, R404A and R410A, refrigerant identifier, among other tools.

²⁶ Recovery machine, reclaiming machine, refrigerant pump, refrigerant identifier, vacuum pump, 12.5 lb, 30 lb and 100 lb cylinders scales, two-way gauges, humidity equipment, chromatograph, among other tools.

²⁷ Including portable refrigerant gas recovery unit for mobile AC use; 30 lb and 123 lb cylinders, leak detectors, vacuum pumps and vacuum meter, among other tools and equipment.

²⁸ This reduction is equivalent to around 20 per cent of the estimated HFC baseline which is 290,299 CO₂-eq tonnes.

the servicing demand for HFC refrigerants and increase energy efficiency. The HFC reduction proposed in stage I of the KIP is higher than what is required under the Kigali Amendment; however, the targets to be met will be the freeze in 2024 and the 10 per cent reduction in 2029 consistent with the Montreal Protocol.

Starting point for sustained reductions in HFC consumption

40. The methodology to calculate the starting point under the cost guidelines for HFC phase-down is still under discussion. The Secretariat notes that the starting point will be established once the Executive Committee decides on the methodology for determining the starting point. Regarding the KIP for Costa Rica, UNDP confirmed that the proposed reductions associated with stage I of the KIP will be deducted from the starting point once this is agreed.

HFC consumption

41. The Secretariat reviewed the consumption levels of HFCs in the country and noted the substantial increase in consumption (58 per cent in mt and 65 per cent in CO₂-eq tonnes) from 2021 to 2022, as shown in table 1 above. Noting that HFC consumption in the country is only for the servicing sector, the Secretariat requested clarification on this increase, as the import trends from previous years demonstrated an average growth rate of six per cent prior to the pandemic²⁹ and normal fluctuations due to changes in supply and demand. The Secretariat asked UNDP whether there was the likelihood of stockpiling in 2022, noting that this was the last year for recording consumption for calculating the baseline.

42. UNDP explained that the decrease in HFC consumption in 2020 and 2021 as compared with the 2019 consumption was due to the COVID-19 pandemic where in these years, very little servicing of equipment was requested. This was exacerbated by the high prices of refrigerants and transport costs during these years which discouraged importers from bringing in these substances. It was further explained that even for 2019, the reported consumption (i.e., 526.4 mt; 1,098,992 CO₂-eq tonnes) would have been higher but for the economic crisis in the second half of the year. In 2022, prices of HFCs dropped by 60 per cent, and the economy picked up as the country was recovering from the pandemic which stimulated increased demand for refrigerants and consequently boosted imports.

43. Data was provided for HFC consumption from 2012 to 2022 based on actual import of these substances into the country since HFCs have been part of the country's licensing system since 2010, although there were no limits on amounts that could be imported. UNDP mentioned that there was no indication that imports in 2022 were due to stockpiles based on interviews with importers who noted that these stocks already have been sold to customers. Information provided in the submission to support the 2022 sectoral consumption in the servicing subsectors was estimated based on already available figures from a review of RAC equipment for an inventory carried out by another organization³⁰ in 2016, and the data was projected to the year 2022, adjusting the values with the actual equipment import figures.

44. In responding to the Secretariat's query on whether a survey of HFC sectoral consumption was done during project preparation in line with the project preparation funding approved by the Executive Committee at the 87th meeting which specifically included a provision for a survey of HFC consumption and its sectoral distribution,³¹ UNDP noted that while they had undertaken a survey, this focused on

²⁹ Using consumption data provided in the submission from 2012 to 2019, fluctuations in consumption remained within 10 per cent of the 6 per cent annual growth rate.

³⁰ The Government of Germany undertook a survey in 2016 of the various sectors using refrigerants to support the preparation of a Greenhouse Gas Inventory of the Refrigeration and Air Conditioning Sector in Costa Rica which can be found in https://www.international-climate-initiative.com/en/iki-media/publication/greenhouse_gas_inventory_of_the_refrigeration_and_air_conditioning_sector_in_costa_rica/

³¹ Decision 87/50(b)(ii).

collecting information from institutions on their RAC equipment inventory and main importers of RAC equipment to forecast growth in the sector and for the service workshops where consultations were held.

45. The Secretariat also compared the projected sectoral consumption data provided by UNDP with the CP data for 2022 reported by the country and noted that the overall consumption contained in table 2 is higher than what had been reported in the CP implementation report and the Article 7 data (table 1). Moreover, there also appeared to be differences between the projected sectoral consumption (table 2) and that provided in the country's 2022 CP data, indicating uncertainties in the actual servicing requirements in the country. For example, there were differences between the sectoral consumption data and reported CP data for R-404A and R-507A use. The Secretariat also noted that some of the HFCs which were reported in small quantities under the CP report were not included in the sectoral forecast for UNDP as the quantities are negligible and not prioritized in stage I.

46. UNDP confirmed that the sector consumption data was obtained through a model based on equipment imports, although the service demand for R-507A reported appears to be much less than R-404A (since there is much less equipment imported with R-507A), the service demand load between R-507A and R-404A is shared by both substances due to the similar properties of both gases. Because of this, it was also observed that many technicians use these substances as drop-in replacements without any restrictions, thus R-507A is being used in equipment that was originally designed for R-404A.

47. The Secretariat was uncertain whether the quantities of HFCs imported in the country in 2022 were representative of the country's use in that year, and requested that a further survey be conducted, possibly as part of the first tranche implementation, to further assess the country's HFC uses in servicing equipment to understand the actual use in the servicing sector vis-à-vis the country's imports.

HFC licensing and quota system

48. 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. Costa Rica has since 2010 applied a licensing system for the import of HCFC and HFC covered in regulation 35676 S-H-MAG-MINAET, described in paragraphs 7-9 above.

Technical and cost-related issues

49. The Secretariat noted the approach by the Government of Costa Rica to structure stage I of the KIP around four main strategic areas focusing on: developing an enabling environment to promote the sustainable use of natural refrigerants and other low-GWP alternatives; strengthening national capacities for the safe use of natural refrigerants and new RAC technologies; reducing demand for HFCs; and activities to reduce emissions of HFCs and improvement of refrigerant life-cycle management. The Secretariat noted the observations below for some individual activities included in each of the four components, during the review of KIP proposal, acknowledging that the country has flexibility in prioritizing activities according to national circumstances.

Programme for monitoring the use of HFCs as fire extinguishing agents

50. In explaining why an activity in the firefighting sector was considered a priority for stage I and noting that consumption in this sector was barely 1 per cent of the total HFC consumption, UNDP informed that this assistance is required to monitor consumption and develop awareness and training activities in order avoid growth in the sector.

Feasibility study for district cooling

51. On the proposal for a feasibility study for district cooling and its eligibility in the context of the current guidelines of the Executive Committee, UNDP reiterated that this technology can be part of the long-term strategy for moving away from HFCs not only in Costa Rica but globally. The Secretariat noted that while district cooling was included for limited demonstration projects under decision 72/40(c),³² the eligibility for future projects had not been established noting that this is a technology that requires high investment costs. After discussions, UNDP maintained the inclusion of this feasibility study as part of the KIP but agreed to consider this as an activity with lower priority.

End-user technical assistance programme to promote the use of alternative refrigerants to HFCs in the RAC sector

52. Regarding the demonstration project for heat pumps as an alternative technology for the RAC sector, UNDP clarified that the Government of Costa Rica would like to explore through a demonstration project how heat pumps could substitute for cooling applications that use high-GWP HFCs. This is supported by demand for water heating boilers in different institutions such as hotels, health centres and small and medium-sized industries as their use could reduce energy consumption.

53. UNDP also explained that the pilot project for the adoption of low-GWP, energy-efficient refrigerants in supermarkets would aim to demonstrate the technology (i.e., transcritical CO₂) and support its uptake in supermarkets in the country; once this is fully demonstrated, the supermarkets would convert to this technology at their own cost, with support from the Government of Costa Rica. The Secretariat noted that the KIP includes a proposal to establish a specialty training institute to be equipped with modern equipment for CO₂ transcritical refrigeration (US \$147,500) concurrently with the demonstration project and asked whether this training institute may be moved to a later stage of the KIP, once the demonstration project shows positive results and the technology uptake is imminent. UNDP pointed out that the training centre will support the sustainability of work with CO₂ and guarantee the technical capacity to provide maintenance and installation services for transcritical CO₂ systems. The centre is expected to provide adequate and quality training for technical personnel and service technicians to be ready for this technology.

54. The Secretariat further noted that these projects would fall within the criteria of decision 84/84 for end-user projects and may be considered in the context of the discussion in document UNEP/OzL.Pro/ExCom/92/43, Report on the end-user incentive schemes funded under the approved HCFC phase-out management plans, and the decisions to be taken during this discussion.

Support for early retirement of inefficient equipment

55. Clarification was sought from UNDP on whether there is a policy framework that would support the successful implementation of this activity, whether this is another end-user incentive scheme, and if there is a business model established to support the establishment of scrapping centres that would be responsible for dismantling the collected equipment. UNDP explained that the supporting policies will be developed only once the project is being implemented, when energy efficiency gains that will accrue to the consumer can be demonstrated, and thus would support the overall energy efficiency programme in the country. The project for early retirement of inefficient equipment is expected to accelerate the phasedown of the use of old equipment based on HFC-134a and R-410A by replacing them with efficient HFC-free

³² Bilateral and implementing agencies were invited to provide proposals for feasibility studies, including business cases for district cooling, no later than the 75th meeting. The resulting studies should assess possible projects, their climate impact, economic feasibility and options for financing such undertakings. The studies should enable stakeholders to understand the advantages and challenges as compared to business as usual. The funding for each study would be limited to a maximum of US \$100,000, with a maximum of four studies to be funded. The Executive Committee is not agreeing with this approval to consider further funding beyond the feasibility studies.

technologies; the dismantling of the old equipment will be done through scrapping centres that are proposed to be established with support under the KIP where they are expected to be self-sustaining in the future, demonstrating the business model for the activity.

Energy efficiency related actions

56. Noting that the end-user projects and the project for the early retirement of inefficient equipment are related to improving energy efficiency of equipment, the Secretariat indicated to UNDP that this may fit well within the funding window under decision 91/65 as these are in the context of HFC phase-down. UNDP clarified that these activities were designed primarily to demonstrate the technologies, and the energy efficiency gains from these are incidental to the overall objective, thus the Government would prefer leaving these in the KIP.

Support for the recovery recycling and reclamation network for HFCs

57. In responding to how this project establishing new R&R centres would link to those already established under the HPMP, UNDP indicated that additional R&R centres for HFCs are needed and would be provided with equipment capable of recovering and recycling HFCs to reduce dependence on new refrigerant; those centres established under the HPMP were only for the recovery and recycling of HCFCs, and equipment had not yet been provided under the HPMP. The Secretariat proposed that UNDP review this activity and ensure that there was no duplication with those already established centres in the HPMP and consider actions to harmonize equipment where possible.

58. UNDP agreed that the component of end-of-life management and eventual disposal of unusable substances that may be collected from these centres be considered under decision 91/66, and that the country should first have an inventory and a plan for the environmentally sound management of these wastes and that these be linked with the component to expand national capacities in the destruction of unwanted substances.

Recovery and reuse of refrigerants in the MAC sector

59. On the recovery and reuse of refrigerants in the MAC sector, UNDP explained that this will support the training on good servicing practices for MAC technicians since the recovery and reuse of HFC-134a is not common in small service workshops in Costa Rica, and due to the lack of an alternative replacement for this refrigerant in vehicles, containment and reuse are important activities. The current proposal includes the provision of tools to 80 MAC service workshops to reduce consumption of new refrigerants in this sector.

Project for the evaluation of the expansion of national capacities in the destruction of unwanted refrigerants and other products with HCFCs and HFCs

60. On the proposal to expand the national capacities in the destruction of refrigerants (US \$69,750) the Secretariat noted that this could potentially be considered under the funding window in decision 91/66 for the preparation of national inventories of waste-controlled substances and a national plan; as a result, it was agreed to remove this item. However, in confirming its removal the Government of Costa Rica indicated it would like to add additional activities to do a study to support the HFC regulatory framework for the Kigali Amendment, specifically committing to develop regulations that would limit the import of second-hand RAC equipment, place bans on the import of domestic refrigerators using HFC-134a and on the import and manufacture of self-contained small commercial refrigeration units below 1 horsepower (HP) and that activities would include a cost-benefit analysis, stakeholder consultations, and other analysis in order to introduce the bans. This additional activity has been included under the policy project component at an additional US \$69,750 to cover the costs of the new activities. Thus, the overall costs requested for stage I of the KIP remained the same.

Estimation of the overall level of costs for stage I

61. In the absence of cost guidelines, the Secretariat is presenting for the Executive Committee’s consideration the level of costs for stage I of the KIP for Costa Rica as submitted. While there were discussions with UNDP related to the magnitude of the funding and the possibility of prioritizing activities, UNDP opted not to make adjustments to the overall costs submitted, which are presented in table 5 above. In analyzing the level of funds proposed, the Secretariat has several observations presented below:

- (a) Costa Rica is a non-LVC country whose HFC consumption is only in the servicing sector, and the requested funding is based on reducing 17 per cent of the 2022 HFC consumption in CO₂ eq-tonnes, thus the amount of HFC to be reduced is higher than the 10 per cent reduction from the baseline required under the Kigali Amendment (i.e., 271,861 CO₂-eq tonnes versus 145,150 CO₂-eq-tonnes);
- (b) Stage I of the KIP proposes activities that need to be implemented because of the country’s need to reduce the use of HFCs since Costa Rica’s imports of HFCs grew by 58 per cent in mt and 65 per cent in CO₂-eq tonnes from 2021 to 2022; however, there are uncertainties on the actual sectoral use of HFCs in 2022 vis-à-vis the country’s imports, the resolution of which may affect the overall level of activities required in stage I;
- (c) While several of the individual activities included in stage I of the KIP (i.e., cost of training workshops, cost of tools and equipment, etc.) were proposed at comparable levels from previously funded projects, there is room to adjust the magnitude and scale of stage I as currently submitted and identify sectors where activities could be prioritized to enable compliance during the period, as well as consider further opportunities to combine efforts with ongoing HPMP activities, where possible; and
- (d) Several activities proposed were generally linked to improving energy efficiency of equipment while phasing down HFCs through demonstration projects and equipment replacement and their funding may be considered under the funding window for decision 91/65.

62. Based on the above, the revised costs of the various components of stage I are presented in table 6 below.

Table 6. Revised cost of stage I of the KIP for Costa Rica (US \$)

Project component	Original Cost (US \$)	Revised cost (US \$)	Note
Programme for the creation of the legal framework and inter-institutional coordination for the implementation of the Kigali Amendment	166,000	235,750	Additional activities added to control imports of new or used equipment that contain HFCs in some RAC applications at a cost of US \$69,750
Programme to increase the capacity of the national customs in the HFC trade control	77,000	77,000	No change
Program to promote the sustainable use of RAC technologies that use low-GWP refrigerants; not-in-kind (NIK) technologies ³³ and more energy efficient equipment	265,000	265,000	No change

³³ The term of not-in-kind (NIK) cooling technologies refers to any alternative cooling systems other than the vapor compression cooling systems that are the most commercially dominant today.

Project component	Original Cost (US \$)	Revised cost (US \$)	Note
Awareness-raising programme on the implementation of the Kigali Amendment	120,500	120,500	No change
Program for the safe use of natural alternatives to HFCs in the RAC sector and improvement of national capacities in the maintenance of RAC systems	1,059,360	1,059,360	No change
End-user technical assistance programme to promote the use of alternative refrigerants to HFCs in the RAC sector	499,050	499,050	No change
Support for the early retirement of inefficient RAC appliances programme	95,800	95,800	No change
Program for monitoring the use of HFCs as fire extinguishing agents	40,000	40,000	No change
Refrigerant conservation program in RAC equipment and systems	184,200	184,200	No change
Management program for refrigerants in recovery, recycling, and reclaim (R&R) network	667,366	597,616	Activity to expand the country's capacity in the destruction of refrigerants at US \$69,750 was removed
Project monitoring	317,428	317,428	No change

63. The total cost for stage I of the KIP was maintained at US \$3,491,704, plus support costs of US \$244,419, to reduce 271,861 CO₂-eq tonnes from the country's remaining HFC consumption eligible for funding. Based on the 2020-2022 average HFC consumption, this would correspond to a reduction of 124.47 mt of HFCs.

64. The overall cost of activities to be implemented in the first tranche remained as originally submitted at the amount of US \$1,571,267 and the activities in the first tranche related to the destruction of refrigerants were removed and instead replaced with additional activities as described in paragraph 56(b).

Gender policy

65. The NOU is fully aware of the gender policy and included funding for the implementation of the operational gender mainstreaming policy of the Fund in stage I of the KIP. This will include engaging a gender expert to preform a gender assessment to identify the barriers to gender equality in the country and develop a gender action plan for priority areas for intervention during KIP implementation. The gender action plan is expected to identify specific gender-responsive approaches for activities such as training, to design specific activities to ensure the involvement of women and other vulnerable groups in the various activities of the KIP and to raise awareness and increase the capacity of the NOU and the country on gender-related issues.

Sustainability of the HFC phase-down and assessment of risks

66. The Government of Costa Rica is committed to ensuring that the activities under stage I of the KIP will be sustained over time with the implementation of the quota system for HFCs, continuous market monitoring including surveys and close monitoring of all the activities being implemented under the KIP.

67. UNDP provided information from an analysis conducted during the KIP preparation that showed that there is a high risk of potential non-compliance for Costa Rica because of the current high growth of HFC consumption reported in 2022, which is 8 per cent above the country's estimated baseline, thus signalling the urgency and importance in the implementation of the activities under stage I. UNDP also

reported that consultations with stakeholders and industry demonstrated that they fully support the activities designed in the KIP as those would support a quick transition and promote the use of natural refrigerants, as the way to reduce consumption.

68. The pilot projects to demonstrate low-GWP technologies (transcritical CO₂) are supported by building capacity in training and which are seen to support the sustainable uptake of these technologies, which would mitigate the potential technology risks faced by the country through unavailable and inaccessible alternative technologies.

69. UNDP also confirmed that quotas for imports of HFCs will be established in 2024 putting in place early controls on the amounts of substances that may be imported to support compliance with the targets of the Montreal Protocol.

Impact on the climate

70. The activities planned by Costa Rica, including its efforts to promote low-GWP alternatives, as well as refrigerant recovery and reuse, indicate that the implementation of stage I of the KIP will reduce the emission of refrigerants into the atmosphere, resulting in climate benefits. A calculation of the impact on the climate of the activities in the KIP indicates that by 2030 Costa Rica will have mitigated between 1.3 million CO₂-eq tonnes of HFCs by 2030, calculated as the difference between the business-as-usual scenario and the HFC reduction scenario.

Co-financing

71. UNDP noted that enterprises/supermarkets identified as beneficiaries of the pilot projects to demonstrate transcritical CO₂ technology will provide co-financing for the implementation of these projects during stage I of the KIP. In-kind resources will also be provided by the Government of Costa Rica to ensure effective implementation of the KIP.

2023-2025 business plan of the Multilateral Fund

72. UNDP is requesting US \$3,491,704, plus agency support costs of US \$244,419, for the implementation of stage I of the KIP for Costa Rica. During the period 2022–2024, the total funding proposed in stage I of the KIP is US \$1,681,255 including agency support costs, which is US \$937,256 above the corresponding amount included in the business plan.

Draft Agreement

73. A draft Agreement between the Government of Costa Rica and the Executive Committee for stage I of the KIP has not been prepared as the draft Agreement template for stage I of KIPs is under consideration by the Executive Committee.

74. If the Executive Committee agrees on funding stage I of the KIP for Costa Rica at the 92nd meeting, funding for the stage could be approved in principle and funds for the first tranche released on the understanding that the Agreement would be prepared and presented at a future meeting once the draft Agreement template has been approved and before the submission of the second tranche.

RECOMMENDATION

75. In the absence of the HFC cost guidelines, the Secretariat has prepared, on an exceptional basis, the following recommendation for the consideration of the Executive Committee.

76. [The Executive Committee may wish to consider:

- (a) Whether to approve, in principle, stage I of the Kigali HFC implementation plan (KIP) for Costa Rica for the period 2023–2030 in the amount of US [\$3,491,704], plus agency support costs of [US \$244,419] for UNDP in order for the country to meet the 2024 freeze and the 10 per cent reduction in HFC consumption by 2029;
 - (b) Noting:
 - (i) That the Government of Costa Rica will establish its starting point for sustained aggregate reductions in HFC consumption on the basis of guidance provided by the Executive Committee;
 - (ii) That once the cost guidelines for HFC phase-down that determine the level and modalities of funding for the servicing sector for Article 5 countries are agreed by the Executive Committee, the reductions from the country’s remaining HFC consumption eligible for funding will be determined in line with those guidelines;
 - (iii) That the reductions from the country’s remaining HFC consumption eligible for funding referred to in sub-paragraph (ii) above would be deducted from that starting point referred to in sub-paragraph (i);
 - (c) Whether to approve the first tranche of stage I of the KIP for Costa Rica, and the corresponding tranche implementation plan, in the amount of [US \$1,571,267], plus agency support costs of [US \$109,989] for UNDP; and
 - (d) Requesting the Government of Costa Rica, UNDP, and the Secretariat to finalize the draft Agreement between the Government of Costa Rica and the Executive Committee for the reduction in consumption of HFCs and submit it to a future meeting once the draft Agreement template is approved by the Executive Committee.]
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