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

PROJECT PROPOSAL: TÜRKIYE

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) UNIDO and UNDP Individual consideration

¹ UNEP/OzL.Pro/ExCom/95/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Türkiye

PROJECT TITLE				AGENCY											
Kigali HFC implementation plan (stage I)				UNIDO (lead), UNDP											
LATEST ARTICLE 7 DATA (Annex F)				Year: 2023		10,775.17 mt		20,337,396 CO ₂ -eq tonnes							
SECTORAL HFC CONSUMPTION DATA (CO₂-eq tonnes) AND ACTIVITIES															
	Aerosol	Foam	Fire-fighting	AC and refrigeration			Servicing	Solvent	Other						
				Manufacturing		Other									
				Refr.	AC										
As submitted (average 2020-2022)	0	1,967,513	2,266,431	4,356,169			15,164,885	33,425	6,695,363						
Latest CP report (2023)	0	895,898	3,448,085	860,579	2,385,753	81,498	15,771,454	984	5,600,261						
KIP stage I activities as agreed (Y/N)	N	TBD	Y	TBD	TBD	N	Y	N	N						
AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING						5,992.74 mt		15,164,885 CO ₂ -eq tonnes							
BASELINE CONSUMPTION DATA (CO₂-eq tonnes)				2020		2021		2022		Average 2020-2022					
HFC annual consumption				17,305,994		21,777,055		46,306,331		28,463,127					
HCFC baseline (65%)										8,654,283					
HFC baseline										37,117,410					
HFC CONSUMPTION ELIGIBLE FOR FUNDING															
Starting point for sustained aggregate reductions								TBD							
Previously approved HFC phase-down investment projects								No							
Aggregate reductions from previously approved projects (CO ₂ -eq tonnes)								n/a							
PROJECT DATA AS AGREED				2024*		2025-2026		2027		2028		2029		Total	
Consumption (CO ₂ -eq tonnes)	Montreal Protocol limits			37,117,410						33,405,669		n/a			
	Maximum allowable			37,117,410						31,790,838		n/a			
	Maximum allowable (%)			100						85.6		n/a			
Amounts recommended in principle (US \$)	UNIDO	Project costs		1,943,985	0	5,262,222	0	1,120,080	8,326,287						
		Support costs		136,079	0	368,356	0	78,406	582,840						
	UNDP	Project costs		845,445	0	1,637,040	0	358,641	2,841,126						
		Support costs		59,181	0	114,593	0	25,105	198,879						
	Total project costs			2,789,430	0	6,899,262	0	1,478,721	11,167,413						
	Total support costs			195,260	0	482,948	0	103,510	781,719						
	Total funds			2,984,690	0	7,382,210	0	1,582,231	11,949,132						
* Recommended for approval at the present meeting															
Reduction from remaining consumption eligible for funding in stage I in CO ₂ -eq tonnes								5,326,572							
Secretariat's recommendation:				Individual consideration											

PROJECT DESCRIPTION

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

I. Summary of the proposal as submitted

2. On behalf of the Government of Türkiye, UNIDO as the lead implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), at a total cost of US \$12,204,313, consisting of US \$8,504,100, plus agency support costs of US \$595,287, for UNIDO and US \$2,901,800, plus agency support costs of US \$203,126, for UNDP, as originally submitted.²
3. The implementation of stage I of the KIP will assist the Government of Türkiye in meeting the target of 13.6 per cent reduction from its HFC baseline consumption by 1 January 2029, which is higher than the 10 per cent required by the Kigali Amendment reduction schedule.
4. The first tranche of stage I of the KIP being requested at this meeting amounts to US \$3,170,250, consisting of US \$2,005,824, plus agency support costs of US \$140,408, for UNIDO and US \$957,026, plus agency support costs of US \$66,992, for UNDP, as originally submitted, for the period of January 2025 to December 2027.

II. Background

Status of implementation of the HCFC phase-out management plan

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

Table 1. HPMP implementation status for Türkiye

	Stage I
Meetings when the HPMP was approved/updated	68 th (approved) / 84 th (updated)
Reduction from baseline	100% by 1 January 2025
Total project cost (US \$)	14,223,540
Date of completion (actual/planned)	31 December 2026

² As per the letter of 5 August 2024 from the Ministry of the Environment, Urbanization and Climate Change of Türkiye to UNIDO.

Status of implementation of previous HFC-related activities

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

Table 2. Previously approved HFC-related activities in Türkiye

Approval meeting	Project title	Implementing agency	Cost (US \$)	Date of completion
74 th	Survey of ODS alternatives	UNIDO	130,000	December 2017
80 th	Enabling activities for HFC phase-down	UNIDO	250,000	December 2021

III. HFC consumption overviewHFC consumption levels

7. While Türkiye only imports pure HFCs, it both imports and manufactures HFC-based blends for all sectors, including R-404A and R-410B used in refrigeration and air-conditioning (RAC) manufacturing, servicing, and firefighting.

8. In 2023, the most consumed substances based on the Article 7 data were R-404A (40.5 per cent of total HFC consumption in CO₂-equivalent (CO₂-eq) tonnes), HFC-134a (26.5 per cent), HFC-125 (8.9 per cent), and HFC-32 (8.7 per cent). While there is local use of R-410A, exports of this blend manufactured locally were significant, representing a negative consumption under Article 7 in 2023. Table 3 presents the country's HFC consumption as reported to the Ozone Secretariat under Article 7 of the Montreal Protocol.

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

HFC	GWP	2019	2020	2021	2022	2023
Metric tonnes (mt)						
HFC-23	14,800	-0.87	0.76	0.94	0.70	1.73
HFC-32	675	704.89	1,144.39	2,166.51	3,705.61	2,618.34
HFC-125	3,500	0.00	382.89	508.79	3,143.32	517.46
HFC-134a	1,430	5,309.88	2,609.96	3,139.70	4,495.11	3,764.12
HFC-143a	4,470	0.00	208.91	196.69	1,380.58	315.00
HFC-152a	124	1,136.38	1,321.77	1,513.12	832.27	718.48
HFC-227ea	3,220	266.79	358.32	263.86	457.57	543.62
HFC-236fa	9,810	19.90	9.41	9.30	6.00	12.50
HFC-245fa	1,030	30.78	83.36	12.49	15.45	3.00
R-404A	3,922	2,974.51	1,282.33	1,668.44	4,204.15	2,101.00
R-407C	1,774	980.14	1,024.19	823.72	543.70	878.72
R-410A	2,088	2,530.73	575.79	1,167.73	3,580.55	-614.92
R-410B	2,229	0.00	0.00	0.00	-2,965.89	-670.11
R-508B	6,808	0.00	147.33	233.88	0.74	1.77
CustMix-134	964	0.00	0.00	0.00	0.00	322.80
Others*		47.71	-6.62	-5.53	93.48	277.68
Total (mt)		14,000.84	9,142.79	11,699.63	19,493.35	10,791.20
CO₂-eq tonnes						
HFC-23	14,800	-12,817	11,295	13,947	10,360	25,594
HFC-32	675	475,801	772,464	1,462,393	2,501,289	1,767,382
HFC-125	3,500	0	1,340,121	1,780,762	11,001,620	1,811,124
HFC-134a	1,430	7,593,124	3,732,237	4,489,765	6,428,010	5,382,688
HFC-143a	4,470	0	933,811	879,186	6,171,193	1,408,028
HFC-152a	124	140,911	163,900	187,627	103,201	89,092
HFC-227ea	3,220	859,054	1,153,788	849,640	1,473,388	1,750,460

HFC	GWP	2019	2020	2021	2022	2023
HFC-236fa	9,810	195,258	92,292	91,225	58,860	122,625
HFC-245fa	1,030	31,705	85,857	12,867	15,914	3,090
R-404A	3,922	11,664,823	5,028,793	6,542,945	16,487,009	8,239,276
R-407C	1,774	1,738,618	1,816,768	1,461,152	964,441	1,558,715
R-410A	2,088	5,282,907	1,201,966	2,437,629	7,474,394	-1,283,637
R-410B	2,229	0	0	0	-6,610,227	-1,493,508
R-508B	6,808	0	1,003,017	1,592,283	5,038	12,058
CustMix-134	964	0	0	0	0	311,121
Others*		187,306	-30,314	-24,368	221,841	633,288
Total (mt)		28,156,692	17,305,994	21,777,055	46,306,331	20,337,396

*Include HFC-152, R-407F, R-417A, R-438A, R-448A, R-449A, R-452A, R-454B, R-507A and HFC-43-10mee

Established HFC baseline

9. The Government of Türkiye reported the Article 7 data for 2020-2022. The country's HFC consumption baseline was established at 37,117,410 CO₂-eq tonnes by adding 65 per cent of its HCFC baseline (expressed in CO₂-eq tonnes) to its average HFC consumption in 2020-2022, as shown in table 4.

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

Baseline calculation components	2020	2021	2022
HFC annual consumption	17,305,994	21,777,055	46,306,331
HFC average consumption in 2020-2022			28,463,127
HCFC baseline (65%)			8,654,283
HFC baseline			37,117,410

Country programme implementation report

10. The sectoral HFC consumption data provided by the Government of Türkiye in its country programme (CP) implementation report for 2023 has some differences with the data reported under Article 7 of the Montreal Protocol. The reasons for the differences are attributed to the accounting of manufacturing and exports of HFC-based blends and expected stockpiles that are not possible to calculate. The size of the differences between the data reported under the CP report and Article 7 between 2020 and 2023 vary between 0.2 per cent and 3.3 per cent of the reported consumption. Additional analysis and monitoring is required to better understand the reasons for these differences.

HFC consumption trends

11. After the 2020 COVID-19 pandemic slowdown and the ensuing logistics crisis of 2021, HFC consumption in Türkiye peaked in 2022 at an unprecedented level. In 2023, consumption was lower than previously projected (and significantly lower from pre-pandemic levels) due in part to the high volumes of imports registered in 2022.

HFC consumption by sector

12. In Türkiye about 50 per cent of all HFCs in CO₂-eq tonnes are used in the RAC servicing sector. From the remaining consumption, 15 per cent is used in manufacturing of RAC equipment including MAC, 7 per cent in firefighting and 6 per cent in the foam manufacturing sector. Twenty-two per cent of the HFC imported in Türkiye is used for the local manufacturing of HFC-based blends, of which a large portion is exported. The HFC consumption by sector is summarized in table 5.

Table 5. HFC consumption in Türkiye by sector (average 2020-2022 – CP report)

Sector	Mt	CO ₂ -eq tonnes	Share (CO ₂ -eq tonnes) in percentage
RAC manufacturing	2,701.74	3,813,098	13
MAC manufacturing	379.77	543,071	2
Foam	2,470.21	1,967,513	6
Firefighting	660.78	2,266,431	7
Solvent	1.25	33,425	0
Other (includes local manufacturing of blends partially exported)	2,166.25	6,695,363	22
<i>Subtotal manufacturing</i>	<i>8,379.99</i>	<i>15,318,901</i>	<i>50</i>
Servicing	5,992.74	15,164,885	50
Total	14,372.73	*30,483,787	100

*The difference between this figure and the reported consumption (average 2020-2022) of 28,463,127 CO₂-eq tonnes is mostly due to the export of locally manufactured blends

Manufacturing sectors

13. Türkiye is an important manufacturer of RAC equipment for both foreign and domestic markets, with an estimated 70 per cent of total production destined for exports. The main export markets are Europe, Central Asia and Africa. RAC equipment manufacturing grows at an average of 10 per cent per year, while the overall domestic market growth rate is about 2.5 per cent. Türkiye also imports finished products in most sectors.

Refrigeration and air-conditioning manufacturing

14. The appliances manufactured include commercial coolers and freezers (sealed equipment), domestic and stand-alone commercial refrigeration units, stationary cooling equipment, single-split AC units, multi-unit central cooling systems, portable room AC equipment, condensing units and distributed systems. HFC-32 is predominant in the residential AC subsector, while R-290 and R-744 (CO₂) dominate in stand-alone refrigeration. Low-GWP alternatives are available and accessible in the country. Currently, Turkish manufacturers follow two different phase-down schedules: products using high-GWP HFCs are still exported to markets other than the European Union (EU), while appliances based on lower-GWP alternatives are destined for domestic sales and exports to the EU.

15. In MAC manufacturing, HFC-134a and HFO-1234yf are used in almost equal proportions, with HFC-134a-based MAC for domestic use and export to Europe scheduled to be phased out by 2025.

Foam

16. The rigid polyurethane (PU) foam manufacturing sector consumes HFC-245fa and HFC-365mfc/HFC-227ea, whereas HFC-134a is used to manufacture integral skin and flexible molded foam and HFC-152a is used in extruded polystyrene (XPS) foam production. During the last two years Türkiye has included imports and exports of HFCs contained in pre-blended polyols in the CP report.

Firefighting, solvent and aerosol

17. HFC-125, HFC-227ea and HFC-236fa have been widely used in critical applications, mainly in civil aviation, military sector, oil/petrochemical industry and museums, hospitals or server rooms, in both total flooding systems and as streaming agents, accounting for 7 per cent of the country's overall HFC consumption. Some of the commercially available alternatives with low or zero GWP to replace high-GWP HFCs include inter alia powdered aerosols, CO₂, water, dry chemicals, inert gases, FK-5-1-12, 2-BTP and CF₃I (trifluoriodomethane).

18. The use of HFCs as solvents is insignificant and consists mostly of HFC-43-10mee used for cleaning electronic systems or as a degreaser in automotive applications. No suitable alternatives for this substance have yet been found. Small quantities of HFC-134a are also used as propellant in aerosol manufacturing.

Impact of the F-gases regulation on manufacturing

19. The manufacturing sectors in Türkiye are impacted by the F-gases regulation, which imposes bans on refrigerants above a certain GWP for particular applications. The regulation, which was published on 29 June 2022, specifies in Article 15 bans on the various applications as shown in table 6.

Table 6. F-gases regulation for the manufacturing sector in Türkiye

Category	GWP limit	Ban effective date
Commercial coolers and freezers (hermetically sealed equipment)	>2,500	1 January 2025
Commercial coolers and freezers (hermetically sealed equipment)	>150	1 January 2029
Stationary cooling equipment*	>2,500	1 January 2025
Single split air-conditioning with <3kg of refrigerant gas	>750	1 January 2025
Multi-unit central cooling systems with capacity of 40 kW or more	>150	1 January 2029
Portable room air-conditioning equipment (hermetically sealed equipment that can be moved between rooms by the end user)	>150	1 January 2025
XPS foam and other foams	>150	1 January 2027

* Except for applications designed to cool the products to temperatures below -50°C

20. This regulation will impact the manufacturing of domestic refrigeration using HFC-134a in 2025; stand-alone commercial refrigeration units using R-404A in 2025 and R-407C HFC-134a in 2029; condensing units and distributed systems using R-404A in 2025; residential AC units using R-410A in 2025; commercial multi-unit central cooling systems using R-410A, R-407C, HFC-134a, and HFC-32 in 2029. There are talks about a planned delay of two years for all categories. If these changes are adopted, two categories would fall beyond the scope of stage I (commercial coolers and multi-unit central cooling systems).

Local manufacturing of blends

21. There are two enterprises manufacturing HFC-based blends, including R-404A, R-407C, R-410A, R-410B, and R-507A. The amounts of locally manufactured blends reported in the CP report for the last two years are 4,304.90 mt in 2022 and 2,138.71 mt in 2023. A large portion of these blends are exported but amounts are not easy to track based on current reports as exports may not occur the same year the blend was manufactured. While both enterprises indicated that they are currently increasing capacity, HFC control measures in non-Article 5 countries might influence their future exports.

Refrigeration and air-conditioning servicing sector

22. There are an estimated 132,147 technicians (1 per cent of them women) and 1,412 registered workshops consuming HFCs in Türkiye. Approximately 6,142 technicians are certified to work in formal servicing shops. The Ministry of National Education (MEB) operates 994 vocational schools with an estimated 2.8 million students of all trades. Technical schools and adult education centres provide theoretical training and hands-on practice for the RAC technician certification process. Certification is authorised by the Vocational Qualification Institute and performed regularly at four examination centres in the country's capital. Trainers and technical personnel working with equipment containing fluorinated greenhouse gases can also obtain training and certification from a consulting and research centre ISEDA, authorized by the Ministry of the Environment, Urbanization and Climate Change (MEUCC). Large RAC enterprises tend to have education or training units for their personnel, and the private sector offers relevant training as well, under MEB's supervision in terms of curriculum approval, acceptance requirements, standards, duration, and certification.

23. Table 7 shows total HFC consumption in the RAC and MAC servicing sectors for both equipment repair and maintenance, and the initial charging of new installations. The average leakage rate of 7 per cent is acceptable in view of the high count of equipment and the vast territory in which the equipment is installed and used. However, the commercial and industrial refrigeration servicing subsectors indicate leakage rates as high as 20 per cent, an issue prioritized in the KIP strategy. The following sections provide more information on each subsector.

Table 7. HFC use for servicing the installed equipment and charging new installations in Türkiye (average 2020-2022)

Sector/ Application	Equipment inventory (a)	Av. charge (b) (kg)	HFC banks (c)= (a)*(b)/1000 (mt)	Leakage rate (d) (%)	Annual need for servicing (e)=(c)*(d) (mt)	Initial charge (mt)	Total servicing (mt)
Refrigeration							
Domestic	20,779,550	0.12	2,494	10	249.35	-	249.35
Commercial stand-alone	439,240	1.5	659	9	59.30	-	59.30
Commercial condensing units	85,000	20	1,700	20	340.00	170.00	510.00
Centralised systems	32,000	40	1,280	20	256.00	128.00	384.00
Industrial	2,565	125	321	20	64.13	31.88	96.01
Transport	1,149,640	10	11,496	15	1,724.46	804.75	2,529.21
Residential AC	20,960,250	1.5	31,440	6	1,886.42	-	1,886.42
Commercial AC	295,620	7.5	2,217	12	266.06	24.00	290.06
MAC	28,750,330	0.75	21,563	3	640.41	-	640.41
Total			73,170	7	5,486.13	1,158.62	*6,644.75

*CP reports were subsequently adjusted, with a consumption in servicing at 5,992.74 mt

Refrigeration servicing

24. The number of domestic refrigerators and freezers is estimated at 34 million units, 61 per cent of which are running with HFC-134a. Commercial refrigeration uses HFC-134a and R-404A, and industrial refrigeration uses HFC-134a and R-417A. The largest consuming refrigeration subsector is transport, which uses R-404A and HFC-134a. Regarding other uses, around 20 mt of HFC-245fa are used in Organic Ranking Cycle (ORC), a thermodynamic process to produce energy that uses an organic fluid, such as refrigerants with a low boiling point instead of water. This application has been grouped with HFCs used in the servicing sector

Air-conditioning servicing

25. The HFCs mostly used in the residential and commercial AC servicing subsector are R-410A, followed by R-407C and HFC-32, which is starting to be used in residential AC. In the MAC sector, while most manufacturing has switched to HFO-1234yf by now, the use of HFC-134a is still predominant for the servicing of AC systems in cars, mini-buses, vans, and buses.

Local installation and assembly subsector

26. There is no clear distinction between the installation and assembly subsector and the general RAC servicing sector in Türkiye. Large clients requiring equipment assembly and installation include hotels, restaurants, and catering enterprises (condensing units and centralised refrigeration systems); supermarkets, beverage enterprises, food processing plants, cold stores, and pharmaceutical establishments (centralised and industrial refrigeration systems and commercial AC); as well as refrigerated trucking enterprises. The installation and assembly of equipment in the food retail and commercial refrigeration subsector is usually performed by general servicing enterprises, while large-capacity industrial refrigeration systems (additionally using R-717 and R-744) are installed by the dedicated departments or servicing representatives of equipment manufacturers. Commercial AC systems and process chillers are assembled by the

manufacturers' installation departments or servicing representatives. The HFCs mostly used in the local installation and assembly subsector are R-404A, HFC-134a and R-410A.

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

Institutional, policy and regulatory framework

27. The national ozone unit (NOU) is responsible for the preparation and implementation of the KIP. The NOU is embedded within the Department of Monitoring Greenhouse Gas (GHG) Emissions, under the Directorate of Climate Change of the MEUCC. The Department monitors, controls, and reports ODS and GHG emissions, imports and exports; carries out audits and studies; raises awareness; and coordinates all activities for the elimination of ODSs and the reduction of F-gases consumption at a national level.

28. Two key regulations supporting the implementation of the Montreal Protocol and the early implementation of the Kigali Amendment in Türkiye are the Regulation on Substances that Deplete the Ozone Layer (published in 1999 and revised in 2006, 2008, 2017 and 2020), and the Regulation on Fluorinated Greenhouse Gases (effective as of 2018; revised in 2022), followed by the 2020 and 2023 Communiqués on the Import and Export of Substances that Deplete the Ozone Layer (and F-gases), intended to be reviewed and revised each year as needed by the Ministry of Trade.

29. Aiming for compatibility with the EU norms and regulations, Türkiye has adopted several standards on the energy efficiency requirements for appliances, the energy performance of buildings, and the energy labelling requirements for buildings and appliances, including several minimum energy performance standards (MEPS) for air conditioners and comfort fans, domestic refrigerators and freezers, professional refrigerators, refrigerators with direct sales function, air heating and cooling products, and air heating and cooling products, high temperature process chillers and fan coil units. Other supporting plans, include the Climate Change Mitigation Strategy and Action Plan (2024-2030), the Climate Change Adaptation Strategy and Action Plan (2024-2030), and the Nationally Determined Contribution (NDC) (2023).

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

Overarching strategy

30. The sectors prioritised by the KIP include commercial refrigeration, residential AC, and domestic refrigeration manufacturing, supported by the upcoming ban on the use of high-GWP HFCs in these sectors; the firefighting sector due to its HFC consumption; and the refrigeration servicing sector. In the servicing sector, HFC reductions will be achieved through the application of policies, training, support for the certification process, and the refrigerant recovery, recycling, and reclamation (RRR) operations. Additionally, Türkiye will carry out end-user, pilot, and incentive projects to encourage the adoption of low-GWP technologies in critical sectors.

Manufacturing sectors

31. During the HFC survey conducted in preparation for the KIP, many enterprises in the residential air-conditioning and domestic and commercial refrigeration manufacturing sectors were hesitant to share manufacturing information. They expressed concerns that disclosure could impact their competitiveness in export markets. Additionally, these enterprises had independently funded prior conversions ahead of the Montreal Protocol schedule, aligning with local regulations that mirror European timelines. Taking this into account, the Government considered three options to assist the manufacturing sectors:

- (a) Submit as part of the second tranche in 2027, an umbrella project covering consumption of R-410A in residential AC, R-404A in commercial refrigeration and HFC-134a in domestic refrigeration;

- (b) Only include the manufacturing sector in stage II of the KIP; or
- (c) Submit to the 97th meeting stand-alone HFC conversion projects in conjunction with energy efficiency components under decision 94/60 for local eligible enterprises interested in receiving assistance.

32. The first option was not pursued due to the lack of information on enterprises and their eligibility, and the second option was not viable as the F-gases regulation entering into force would require that enterprises undertake their conversions during stage I. Thus, the Government of Türkiye requested flexibility to allow the inclusion of investment projects in stage I of the KIP to be submitted at a future meeting.

Proposed reductions

33. With the activities included in the refrigeration servicing and firefighting sectors, Türkiye intends to reduce its consumption by 13.6 per cent from the baseline by 2029, as presented in table 8. The country expects to achieve additional HFC reductions if investment projects in several manufacturing sectors could be included in stage I of the KIP.

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

	2023*	2024	2025	2026	2027	2028	2029
HFC consumption forecast (**)	20,344,485	30,790,888	32,128,481	33,466,073	34,803,665	36,141,258	37,478,850
Montreal Protocol HFC consumption limits	n/a	37,117,410	37,117,410	37,117,410	37,117,410	37,117,410	33,405,669
Proposed HFC consumption under the KIP	n/a	37,117,410	37,117,410	37,117,410	37,117,410	37,117,410	32,080,222
Proposed reduction in HFC consumption from baseline (%)	n/a	0	0	0	0	0	13.6

* As per Article 7 data.

** Growth calculated based on projected trend of historical consumption available (2019-2023)

34. Based on the forecasted consumption, the country would have difficulties to comply with the consumption target in 2029. However, the forecast presented in table 8 is based on previous HFC consumption levels available. The Secretariat notes that this forecast does not consider the effects of the F-gases regulation in the local market, which is an important factor in this case.

Proposed activities

35. Stage I of the KIP for Türkiye is composed of seven components. The proposed activities and cost are presented in table 9.

Table 9. Activities proposed under stage I of the KIP for Türkiye

Description		Cost (US \$)
Component 1: Regulatory framework and control mechanisms (UNDP)		
1.1	Strengthening the HFC-related policy and regulatory framework through meetings; dissemination activities for stakeholders on the development or updates of relevant regulatory measures, including safety standards, training for industry associations and sectors consuming HFCs on legal instruments and policy measures related to the control and	210,000

Description		Cost (US \$)
	reduction of HFC emissions and consumption; and two study tours for key stakeholders on the development, implementation and updates of policies and regulations related to F-gases	
1.2	Development of a customs training programme on HFCs trade control; design of a border control handbook for customs officers and development of guidelines for customs brokers; one workshop for customs officers on the illegal trade in controlled substances; 24 training courses for enforcement officers on HFC trade control and techniques to detect regulated refrigerants in blends, eight courses for HFC importers and brokers on the updated policies and regulations on HFC trade control; eight training courses for customs consultancies; and provision of equipment for three customs laboratories, including a gas chromatograph, refrigerant identifiers, leak detectors, and A2/A3 refrigerant recovery equipment	468,000
Subtotal component 1		678,000
Component 2: Project addressing end users – laboratory strengthening (UNDP)		
2.1	Strengthening of an accredited testing laboratory for RAC equipment manufacturers and importers to ensure compliance with national and international performance and energy efficiency standards including test module construction, equipment and material and certification consultancy and training	800,000
Subtotal component 2		800,000
Component 3: Capacity building (UNIDO)		
3.1	Updating the codes of practice and RAC training curricula to include the new codes of practice, the Kigali Amendment and the F-gases Regulation; and disseminating the results	95,000
3.2	Establishment of two or three centres of excellence with training modules including 10 demonstration units for F-gases, HCs and CO ₂ ; provision of reference material and support for the centres' operation	420,000
3.3	Training of 200 certifiers based on the curricula of the existing technician certification system, prioritizing female trainers	200,000
3.4	Training in preparation for certification on good practices, brazing competency and the safe use of flammable refrigerants, 4,000 RAC technicians (both formal and informal) in 266 sessions held at the centres of excellence and other training institutions, prioritizing women and technicians working independently, in remote areas, at SMEs, or at enterprises owned or operated by women	1,596,000
3.5	Provision of tools ³ for 1,000 technicians to be certified and to encourage refrigerant recovery and recycling, prioritizing women and technicians from remote regions	2,550,000
3.6	Support for three RRR centers established under the HPMP through provision of consumables; establishment of a tracking system for labeled cylinders involving QR codes and dedicated software; and related training	200,000
3.7	Provision of refrigerant recovery unit tools ⁴ to 350 MAC servicing workshops	620,000
3.8	Provision of mobile recovery unit tools ⁵ to 205 workshops in the commercial and industrial refrigeration sectors	320,000
3.9	Provision of 40 refrigerant identifiers to customs officers	210,000
Subtotal component 3		6,211,000
Component 4: Sectoral projects (UNIDO)		
4.1	Pilot project in the hotel, restaurant and catering (HORECA) ⁶ subsector to replace R-404A-based commercial refrigeration units with high-efficiency systems using CO ₂ , including monitoring the installations' energy consumption and providing material for case studies under the awareness component. The project will prioritise enterprises owned or operated by women or that employ women technicians, as well as SMEs in remote areas, when possible	500,000
4.2	Pilot project in the residential AC subsector to replace R-410A-based equipment with R-290-based split heat pumps with energy efficiency higher than the prevailing MEPS,	500,000

³ Including a recovery unit and cylinders plus other essential tools

⁴ Including recovery units, recovery cylinders, leak detectors and electronic scales.

⁵ Including recovery units, recovery cylinders, leak detectors and electronic scales.

⁶ The HORECA economic sector uses a combination of stand-alone commercial refrigeration, condensing units, and centralised distributed systems, accounting for a good portion of the enterprises' energy consumption.

Description		Cost (US \$)
	including the monitoring of installations and publishing of reports and results, to demonstrate the viability and benefits of using R 290-based products and promote the use of heat pumps and the adoption of systems with high energy efficiency	
4.3	Two study tours to North America, Europe, or Asia: one to research and development centres and laboratories for eight MAC manufacturers and government stakeholders to learn about R-744 and R-290; and one for eight representatives of the RAC sector and regulatory institutions to learn about the implementation of regulations and policies related to F-gases, low-GWP alternatives, and the adoption and monitoring of regulations	120,000
Subtotal component 4		1,120,000
Component 5: Activities in the firefighting sector (UNDP)		
5.1	Development of an inventory of enterprises that import, sell, use, install and refill HFC-based fire-control equipment and flood systems, for monitoring purposes; amendment to the customs code for cylinders used in the firefighting sector; preparation of a booklet on “Good Environmental Practices in the Maintenance, Recharge, and Use of Portable HFC Fire Extinguishers” and booklets for customs officers on effective control measures for fire extinguishers and fire protection systems containing HFCs; demonstration of alternatives in the firefighting sector; six training workshops to promote best practices and HFC phase-down in the sector; establishment of a training and examination centre for the safe handling and recovery of F-gases used in fire protection systems, compatible with the F-gas technician certification system and accredited by the Vocational Qualification Institution; and provision of tools ⁷ for the safe handling and recovery of F-gases to technician training centres	515,000
Subtotal component 5		515,000
Component 6: Activities in the solvent and aerosol sectors (UNDP)		
6.1	Demonstration and analytical comparative laboratory studies between HFCs and possible alternatives (e.g., propane-butane, HFOs, nitrogen (N ₂) and CO ₂); inventory of enterprises and market analysis of those that use HFCs as propellant and/or solvents in their aerosol formulations; technical support to aerosol and solvent enterprises using HFCs regarding the National Inventory System registration and record-keeping in line with the national F-gases Regulation; three workshops to disseminate the results of demonstration studies and promote alternatives to HFCs; and a study tour for the representatives of enterprises and authorities to engage with experts and organizations with experience using alternatives to HFCs	240,000
Subtotal component 6		240,000
Component 7: Awareness-building campaigns (UNIDO, UNDP)		
7.1	Eight awareness-building campaigns on technician certification, RRR, centres of excellence, pilot projects, and alternative technologies for government representatives, industry stakeholders and associations, technicians, installers and end users, including preparation and dissemination of material, workshops, and use of media (UNIDO)	400,000
7.2	Awareness raising campaigns on regulations, energy efficiency, and climate change for government representatives, industry stakeholders in the firefighting and solvent sectors, associations and the public, including the organization of workshops, the design of a television, print and social media campaign broadcast through official channels, website update, and at least three campaigns designed specifically for teachers and school children (UNDP)	405,000
Subtotal component 7		805,000
Total for all activities		10,369,000
Project implementation, coordination and monitoring (PMU)		
PMU UNIDO		773,100
PMU UNDP		263,800
Subtotal PMU		1,036,900
Total cost		11,405,900

⁷ Including demo stationary fire systems, cylinders, leak detection kits, soldering kits, vacuum pumps, recovery units

Project implementation, coordination and monitoring

36. The project coordination and monitoring unit (PMU) has been estimated at 10 per cent of the value of the activities proposed for all sectors, as shown in table 9. The UNIDO component includes a project coordinator to support overall implementation of the project and coordination with national stakeholders and consultants, a project associate and a project assistant to provide administrative support. Technical advisors will also be made available as required to support the NOU in developing technical specifications of equipment to be procured, accompany the NOU to visit training centers and inspect equipment. For the UNDP portion, a project manager and two associate level staff will assist the NOU in the coordination of development of TOR, procedures of hiring and procurement, and all operational and national activities of the projects under UNDP. Local and international experts will also be made available as required for specific tasks.

Gender policy implementation

37. In 2019, Türkiye had the lowest gender development index of all OECD⁸ countries, with women earning on average 47 per cent of men's comparable salaries in 2019, and only 30 per cent of women active in the workforce. In line with decisions 84/92(d), 90/48(c) and 92/40(b), the KIP lists and describes specific activities that will be implemented to address the identified gender gap and related risks and opportunities. For example, the codes of practice proposed under the KIP will include a section to remove any misconceptions that exist about women's abilities in performing certain tasks. A certain number of tools delivered under the KIP will also be prioritized for use by female technicians to enhance the participation of women in the sector. Gender-disaggregated data will be collected where relevant. The KIP sets gender indicators and targets to measure the quantity, quality, and timeliness of interventions and their results, and to ensure gender mainstreaming in the overall project. For instance, an initial participation target of 20 per cent will be set for women in training programmes for customs and other enforcement officers.

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

38. Türkiye will achieve the completed phase-out of HCFCs by 1 January 2025. The implementation of the last tranche of stage I of Türkiye's HPMP and of the first tranche of stage I of its KIP will only coincide over the 2025-2026 period. Stage I of the KIP builds on the HPMP activities by supporting the RRR centres with consumables, training the certifiers, and training the personnel involved in the control of HFC imports. The training carried out under the HPMP will focus on AC technicians, whereas the KIP will target refrigeration and MAC technicians.

Total cost of stage I of the Kigali HFC implementation plan

39. The budget for stage I has been proposed at US \$11,405,900. The costs of activities in the refrigeration servicing sector have been proposed in line with decision 92/37.

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

40. The first funding tranche of stage I of the KIP, in the total amount of US \$2,962,850, will be implemented between January 2025 and December 2026 and will include activities listed in table 10.

Table 10. Activities to be implemented in the first tranche of stage I of the KIP for Türkiye (US \$)

Agency		Description	Cost
Component 1		Regulatory framework and control mechanisms	
1.1	UNDP	Strengthening the HFC-related policy and regulatory framework through informative workshop held for RAC sector stakeholders; formulation,	80,000

⁸ Organization for Economic Cooperation and Development

Agency		Description	Cost
		adaptation or updates to the existing framework, including codes and standards for HFC control; and two study tours for key stakeholders on F-gases policies	
1.2	UNDP	Development of guidelines and reference material for customs officers and importers; development of an HFC trade control system including an app for customs officials (8) and importers (8); and provision of equipment to three customs labs	181,000
		Subtotal component 1	261,000
Component 2		Project addressing end users – laboratory strengthening	
2.1	UNDP	Preparation of test model ⁹ and training support for Eurovent accreditation, management system, and test administration	65,000
		Subtotal component 2	65,000
Component 3		Capacity building	
3.1	UNIDO	Updating the codes of practice for all sectors and organization of related workshops	60,000
3.2	UNIDO	Provision of F-gas, HC and MAC demonstration units for the establishment of a new centre of excellence and development of related reference material	130,000
3.3	UNIDO	Training of 80 certifiers	80,000
3.6	UNIDO	Setting up tracking software for cylinders for three RRR centres	40,000
3.7	UNIDO	Provision of refrigerant recovery units to 175 MAC servicing workshops	310,000
3.8	UNIDO	Provision of mobile recovery units to 102 refrigeration sector enterprises	160,000
3.9	UNIDO	Provision of 20 refrigerant identifiers to customs offices	105,000
		Subtotal component 3	885,000
Component 4		Sectoral projects	
4.1	UNIDO	Initiation of the pilot project in commercial refrigeration with CO ₂ in the HORECA sector	350,000
4.2	UNIDO	Initiation of pilot project for heat pump units with R-290 in residential AC	350,000
4.3	UNIDO	Study tour for the MAC sector	60,000
		Subtotal component 4	760,000
Component 5		Firefighting sector	
5.1	UNDP	Development and dissemination of awareness and information material for end users (various media) and of booklets for customs points workshops; provision of tools for the training centre	270,000
		Subtotal component 5	270,000
Component 6		Solvent and aerosol sectors	
6.1	UNDP	Development of a demonstration laboratory study and technical support to set up a national inventory of HFC-consuming enterprises	90,000
		Subtotal component 6	90,000
Component 7		Awareness-building campaigns	
7.1	UNIDO	Development and dissemination of material and organization of workshops	160,000
7.2	UNDP	Design of a communication campaign; organization of 4 assessment workshops; and updates to the website	202,500
		Subtotal component 7	362,500
PMU			
	UNIDO	Project management and coordination	200,824
	UNDP	Project management and coordination	68,526
		Subtotal for project management and coordination	269,350
		Grand total for the first tranche of stage I	2,962,850

⁹ 1,500–18,000 m³/h air flow, 100 kW capacity, air enthalpy test method, water enthalpy and flow.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

V. Comments

HFC consumption

HFC consumption fluctuations in 2020-2022

41. In 2022, Türkiye's HFC consumption increased to a level of 19,493 mt (46,309,766 CO₂-eq tonnes), which is 67 per cent above the 2021 consumption in mt (or 113 per cent in CO₂-eq tonnes). While it is noted that HFC consumption in 2020 and 2021 was low due to the COVID-19 pandemic, HFC consumption in 2020 is also 39 per cent above the 2019 consumption in mt (or 64 per cent in CO₂-eq tonnes).

42. UNIDO indicated that the peak consumption in 2022 was not an anomaly or an outlier when considering on a trend basis rather than a year-over-year basis because of the lower than usual consumption in 2020 and 2021 due to COVID and logistics crisis. UNIDO provided a trendline predicting a consumption in 2023 of around 30 million CO₂-eq tonnes, which was close to the 28 million CO₂-eq tonnes of consumption of 2019.

43. Subsequently, HFC consumption for 2023 was reported at 20 million CO₂-eq tonnes, which is substantially lower than the predicted value. This seems to indicate that the market may have compensated for peak imports in 2022, and the level of consumption reported for 2022 may not represent exclusively the regular immediate needs of the manufacturing and servicing sectors for that year. HFC consumption in 2023 is also lower than 2019 consumption (before the pandemic).

44. The Secretariat notes that in the case of Türkiye there may be more factors having an effect in the HFC consumption trends, such as the manufacturing of HFC-based blends, which peaked in 2022, exports of HFC-based products to non-Article 5 countries with restrictions on the level of GWP used in those products, and the future impact of Türkiye's F-gases regulation, which establishes reductions in the level of GWP for the substances used in certain sectors.

45. The Secretariat considers it important to continue monitoring the country's HFC consumption behavior over the coming years to better understand the effects of the factors mentioned; however, based on the information available there may be opportunities for achieving additional HFC reductions under stage I of the KIP. The extent of those reductions is still unclear, and more information is needed on important manufacturing sectors using HFCs, as explained in the sections below.

Overarching strategy

Inclusion of investment projects in the manufacturing sectors at a future meeting

46. The Secretariat notes the following in relation to the manufacturing sectors using HFCs in Türkiye:

- (a) Fifty per cent of the HFC consumption in Türkiye is by the manufacturing sectors (including manufacturing of blends). HFC-based products manufactured in Türkiye are exported to non-Article 5 countries, exported to Article 5 countries and sold domestically. It is likely that some of the enterprises manufacturing in Türkiye have total or partial non-Article 5 ownership; however, due to the lack of detailed information in the sectors, it is not possible to have a good understanding of the amounts of HFCs used in manufacturing that are eligible for funding;
- (b) There may currently be HFC reductions taking place after the baseline years for HFC-based products manufactured in Türkiye for export to Europe;

- (c) Because of the enforcement of the Türkiye F-gases regulation, HFCs used in manufacturing of some products sold domestically would also need to be substantially reduced by 2025, 2027 or 2029; and
- (d) HFCs used in the manufacturing of products exported to other Article 5 countries may still grow if the regulations in those countries still allow the imports of those products.

47. The Secretariat reminded UNIDO of the expectation of stage I of the KIP to contain all activities fully developed, including the investment projects. However, noting the circumstances described (i.e., the need for additional time to obtain meaningful data in the manufacturing sectors, and to assist eligible enterprises during stage I to comply with the F-gases regulations), the request for flexibility, and that Türkiye is in position to achieve additional HFC reductions from its baseline in stage I of the KIP, the Secretariat discussed with UNIDO the options considered for addressing the manufacturing sector.

48. Based on the time required for collecting comprehensive information and formulating project proposals, UNIDO would be able to submit the investment projects to the first meeting in 2026. The option of withdrawing the present proposal and only resubmit it once the investment projects are formulated would delay assistance to Türkiye to address HFCs for one year and a half.

49. To ensure proper preparation of these investment projects, UNIDO submitted to the present meeting preparatory funding for investment projects in 29 enterprises in the commercial refrigeration and AC sectors to be included in stage I of the KIP, including an energy efficiency component pursuant to decision 94/60. These requests will be considered under the agenda item 9(d) as part of UNIDO's work programme amendments.

50. More specific information on applications and amounts of HFCs that will be phased out by these projects would only be available once the projects are formulated. However, noting that the F-gases regulation will restrict the manufacturing of equipment using high-GWP alternatives in these sectors, the Secretariat indicated the expectation that with the submission of the investment projects, information should also be made available on the overall estimated HFC consumption that will be phased out during stage I in a self funded manner by enterprises exporting to non-Article 5 countries and selling in the domestic market. Based on the limited available data, it is difficult to predict the additional HFC reductions that stage I of the KIP would have once the manufacturing activities are added.

51. Based on the discussion, the following proposal is presented for consideration by the Executive Committee:

- (a) Consideration of stage I of the KIP as submitted, to achieve 13.6 per cent (adjusted to 14.4 per cent) reductions in HFC consumption based on the activities presented in the refrigeration servicing and firefighting sectors, with the adjustments to some activities as discussed in the next sections;
- (b) Provision of flexibility to the Government of Türkiye to formulate investment projects to phase down HFC by eligible enterprises in the commercial and domestic refrigeration and AC manufacturing sectors, and the foam manufacturing sector, to be submitted for consideration no later than at the 98th meeting, on the understanding that these projects will be integrated in stage I of the KIP and that by adding the manufacturing component to the KIP, additional HFC reductions will be achieved from the eligible assisted enterprises, as well as HFC consumption phased out by enterprises that are ineligible or that opted to eliminate HFC with their own funds.

Government's commitment to reduce HFC consumption in advance of the Montreal Protocol targets

52. During the discussions, UNIDO highlighted the strong commitment of the Government of Türkiye to support reductions in HFC consumption in advance of Montreal Protocol targets, which is reflected in the existing regulations restricting the use of high-GWP HFCs for some uses at specific dates. Although the Government's transmittal letter¹⁰ endorsed the submitted proposal, it did not specify the level of reduction, so the Secretariat followed up with UNIDO to acquire a more explicit letter in line with decision 92/44. UNIDO corroborated the strong commitment from the Government and indicated that an additional letter was requested. At the time of issuance of the document the letter had not been received.

Institutional, policy and regulatory framework*HFC licensing and quota system*

53. In line with decision 87/50(g), UNIDO has confirmed that Türkiye has an established and enforceable system of licensing and quotas for monitoring HFC imports/exports in place. The NOU allocates, approves and issues the annual HFC import and export quota and licences. Through the Directorate of Climate Change and the General Customs Administration's single window system, all licenses and quotas can be viewed directly by the customs officers. The quota and import licenses are issued annually and expire at the end of the calendar year. Importers, exporters, distributors and manufacturers are obliged to submit relevant reports to the Annual Report Database managed by the MEUCC. The quota issued for 2024 is equivalent to the country's baseline level.

Technical and cost-related issues*Local manufacturing of HFC-based blends*

54. The Secretariat noted that a significant volume of HFC-based blends is manufactured in the country for both domestic use and export. These blends are reported under the "manufacturing of blends" column in the CP report, while the pure substances used to create these blends are recorded under the use "others" column. This partially explains the large share of "other" uses in the CP report.

55. During the project review process, UNIDO assisted the country in adjusting CP reports for 2020 to 2022 to more accurately represent the local uses of HFCs and HFC blends in the CP report. However, an added complexity arises from the fact that locally manufactured blends can be exported in a different year than when they were produced, making it more challenging to track and understand HFC consumption levels. Additionally, it remains unclear how the F-gases regulation, which affects the manufacturing of RAC systems using R-404A, R-407C, R-410A and R-507A, will impact local blend production during stage I of the KIP. The Secretariat will continue monitoring the reporting of local blend manufacturing as part of the project review process for future tranche requests.

Refrigeration servicing sector

56. On component 1 (regulatory framework and control mechanisms) upon request, UNDP provided additional detail on the measures considered, which include the adoption of standards on levels of refrigerant charge in RAC equipment to be consistent with the EU standards. The plan will also provide support to the government by integrating the updated measures in the National Cooling Action Plan (NCAP) and its priority areas. Regarding customs, there are only six customs directorates authorized as specialized customs for the importation of F-gases, which are being prioritized in the KIP. As Türkiye is a transit country, the training of officers and equipping of labs in customs directorates will be crucial to prevent

¹⁰ Letter of 5 August 2024 from the Ministry of the Environment, Urbanization and Climate Change of Türkiye to UNIDO.

illegal trade of HFCs. During the discussion on prioritization of activities for stage I of the KIP, UNDP reallocated funds initially planned for the solvent sector to component 1 and to awareness, to provide additional support for the update of regulations, increase the number of training courses for customs officers, and add training courses for customs brokers, other public institutions and stakeholders. The final costs as submitted and agreed are shown in table 15.

57. On component 2, UNDP explained that it is aimed to upgrade a currently operating laboratory to enhance its capacity for conducting required tests in testing and validating equipment. The focus areas include performance evaluation (stress ambient conditions, new material resistance and performance, energy efficiency, cooling capacity and overall other metrics); electronic parts and integrated systems performance under stress conditions and confirmation of proper installation within the appliances; and environmental and regulatory compliance. The laboratory operates under a governmental institution serving all sectors. UNDP clarified that the upgrade will enable testing of equipment using flammable refrigerants and ensure compliance with local HFC control regulations for manufactured and imported equipment. Following discussions on the project's cost elements, it was agreed to reduce the funding request from US \$800,000 to US \$650,000, with the beneficiary laboratory providing increased co-financing. The Fund would support part of the test module/climate chamber (US \$200,000), additional equipment and tools¹¹ for the facility upgrade (US\$400,000) and assistance to obtain Eurovent accreditation, as well as training in system management and test administration (US \$50,000). The beneficiary will finance other components, including part of the test module, climate chamber, civil works, safety installations, and additional materials not covered by the Fund. The funds reduced from this project were reallocated to component 1 and component 5, as shown in table 15.

58. On component 4, UNIDO provided the following detail about the two pilot projects proposed:

- (a) The pilot project in commercial refrigeration intends to demonstrate the use of CO₂-based equipment as a replacement of R-404A-based equipment currently in operation. The project will support part of the installation cost (between US \$10,000 and US \$30,000 per system), which will be offered as a rebate by certified technicians and installers serving the systems. The beneficiary will finance the cost of the equipment and facilitate monitoring of performance and energy use. The retired units will have their refrigerant charge recovered and delivered to RRR centers or stored (in case of remote locations) and will be disposed of in accordance with existing regulations. It is estimated that the project would cover around 20 installations at different businesses chains to ensure replicability;
- (b) The project in residential AC intends to provide an incentive to owners of R-410A-based AC units to replace their equipment by R-290-based heat pumps rather than HFC-32-based AC units already available in the market. With an estimated cost of US \$400 per 3.5 kW AC unit, it is intended to reach 2,000 units by providing a 50 per cent incentive. Regarding supporting regulations, UNIDO informed that changes to the F-gases regulation expected on 1 January 2027 could possibly include reducing the GWP limit on AC split units below the current 750, thus excluding HFC-32. UNIDO intends to ensure a geographical spread and targeting various economic sectors to increase replicability.

59. The Secretariat notes that these two projects provide incentives to end users. The projects relate to other activities in the KIP, such as RRR, technicians training on low-GWP technologies and technicians' certification; the price of R-290 in 2022 (US \$2.50/kg) is below the price of HFC-32 (US \$4/kg) and future updates are expected for the F-gases regulations to reduce GWP limits in AC units. The proximity to the European market where components and know-how on CO₂ and R-290 technology are available, and the

¹¹ Including inter alia air tester chambers, heat recovery coils, temperature and humidity measurement devices, air compressors, control meters, water cooling condensing unit, test water system, and general measure tools (data loggers, thermocouples, power meters, among others)

fact that local manufacturers are exporting to those countries are expected to contribute to the local availability of the technologies. In line with decision 92/36(g), UNIDO was requested to submit, upon completion of the two projects, a final report on the implementation of these projects, including the HFC phase out and energy efficiency gains achieved,

Firefighting and solvent sectors

60. Regarding the solvent sector, UNDP explained that the main goal of the activity was to monitor the use of the HFCs in the sector to avoid an unexpected consumption increase. However, upon discussion on the activity and noting the negligible level of consumption and minimum contribution that this sector could have in reducing HFCs in stage I, UNDP agreed to only allocate US \$10,000 for the solvent sector to gain a better understanding of the sector and explore options to phase out HFCs in this sector at the stage II. The funds initially allocated to this activity were reallocated to other activities, including the firefighting project and component 1 on regulatory framework, as shown in table 15.

61. Regarding the firefighting activity, UNDP explained that this sector, consuming 7 per cent of HFCs in the country, is a priority for stage I of the KIP. Firefighting must comply with the standards and provisions in the F-gas regulation in the same manner as the RAC sector. There are 89 enterprises in manufacturing of fire protection equipment and 643 enterprises working for maintenance, repair and filling of fire protection equipment/systems. Technical assistance to this sector is considered highly relevant, along with the adoption of best practices through demonstrations.

62. Telecommunication and computer rooms, energy buildings, libraries and archives and oil and gas sectors are the main HFC consumers on fire suppression. Inert gases, CO₂ systems, FK-5-1-12, powder systems and water mist systems can be considered as alternatives. The project includes two demonstration projects to test the performance of several alternatives under different conditions. The parameters measured include speed of reaction, damage of materials, percentage of damage by the fire, possible affection of human lives, and other parameters.

63. The F-gases regulation and certification scheme currently covers the RAC, heat pump, firefighting, and electrical switchgear sectors. Certification for technical personnel is conducted at training and examination centers accredited by the Vocational Qualification Institution. Under national legislation, technical staff must hold F-gas certification to work on equipment containing F-gases. The certification curriculum is tailored to each sector, with four accredited centers available for the RACHP sector. However, no centers currently certify technicians for the firefighting sector, leaving a gap despite legal requirements. To address this urgent need, the plan is to upgrade at least two existing training and examination centers to certify firefighting technicians. These centers, already experienced in F-gas certification, will receive necessary equipment to meet the distinct requirements of firefighting training.

64. The funding of activities in the firefighting sectors are to be considered on a case-by-case basis. Noting that the activities proposed are like those in the refrigeration servicing sector, it was agreed to fund them together with the servicing sector at US \$5.10 /kg. The reductions from HFC consumption from the starting point were therefore based on the average GWP of the servicing sector, firefighting and the solvent.

Calculation of reductions from HFC consumption from the starting point

65. Based on the agreed costs of US \$10,369,000 for the servicing, firefighting and solvent sectors, and in line with the methodology for converting US \$/kg to US \$/CO₂-eq tonne in the servicing sector described in annex I of document UNEP/OzL.Pro/ExCom/92/46, the reduction from the country's remaining HFC consumption eligible for funding from the servicing sector is 5,326,572 CO₂-eq tonnes, as summarized in table 14. In light of those agreed reductions, the Government agreed to reduce its 2029 HFC consumption to 31,790,838 CO₂-eq tonnes, a reduction of 14.4 per cent of the country's HFC baseline for compliance.

This reduction is slightly higher than the originally 13.6 per cent proposed due to the corrections to the data made during the review of the project.

Table 14. Agreed costs and reductions from HFC consumption eligible for funding from the servicing sector, and 2029 target

Servicing sector		
Average HFC consumption in the servicing, firefighting and solvent sector in baseline years*	mt	6,653.30
	CO ₂ -eq tonnes	17,430,811
Average GWP of HFC consumption in the servicing sector firefighting and solvent		2,619.87
Agreed funding	US \$	10,369,000
Agreed cost-effectiveness threshold	US \$/kg	5.1
Reductions from remaining HFC consumption in servicing, firefighting and solvent	mt	2,033.14
	CO ₂ -eq tonnes	5,326,572
Reductions from all sectors and 2029 target		
Established HFC consumption baseline	CO ₂ -eq tonnes	37,117,410
<i>Reductions in remaining HFC consumption eligible for funding from the servicing, firefighting and solvent sectors</i>	<i>CO₂-eq tonnes</i>	<i>5,326,572</i>
2029 target	CO ₂ -eq tonnes	31,790,838

*Because it was agreed to fund the firefighting and solvent activities together with servicing at US \$5.10/kg, the average HFC consumption also includes the consumption in these sectors

Project management unit

66. Funding for the project management unit (PMU) for stage I was adjusted from US \$1,036,900 to US \$798,413 (US \$595,287 for UNIDO and US \$203,126 for UNDP) calculated at 7.7 per cent of the activities' costs.

Total project cost

67. At the total cost of US \$11,167,413, stage I of the KIP for Türkiye will result in a reduction of 5,326,572 CO₂-eq tonnes from the country's HFC consumption eligible for funding, as summarized in table 15.

Table 15. Total cost of stage I of the KIP for Türkiye (as agreed)

Activity	Agency	As submitted (US \$)	Agreed cost (US \$)	Phase-out (mt)	CE* (US \$/kg)
Component 1: Regulatory framework and control mechanisms	UNDP	678,000	933,000	2,033.14	5.10
Component 2: Project addressing end users – laboratory strengthening	UNDP	800,000	650,000		
Component 3: Capacity building servicing	UNIDO	6,211,000	6,211,000		
Component 4: Sectoral projects servicing	UNIDO	1,120,000	1,120,000		
Component 5: Activities in the firefighting sector	UNDP	515,000	610,000		
Component 6: Activities in the solvent and aerosol sectors	UNDP	240,000	10,000		
Component 7: Awareness-building campaigns	UNIDO	400,000	400,000		
	UNDP	405,000	435,000		
Project implementation, coordination and monitoring (PMU)	UNIDO	773,100	595,287	n/a	n/a
	UNDP	263,800	203,126		
Total		11,405,900	11,167,413	2,033.14	5.49

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

68. Stage I of the KIP will be implemented in three tranches. Except for the removal of the technical assistance in the solvent sector, no modifications were made to the plan of action for the first tranche.

Co-financing

69. The Government of Türkiye and UNIDO have made efforts to identify possible sources of co-financing within the government. The centres of excellence being strengthened through the KIP will provide in-kind financing by providing their premises and part of staff to man the operations. The testing laboratory will be partially financed from local resources in a manner that guarantees its independence. Also, the beneficiaries of the demonstration projects will provide co-financing for the necessary sites preparation and will provide access to their sites for the installation of equipment.

2024-2026 business plan of the Multilateral Fund

70. UNIDO and UNDP are requesting US \$11,167,413, plus agency support costs, for the implementation of stage I of the KIP for Türkiye. The total value of US \$2,984,690, including agency support costs, requested for the period of 2024–2026, is US \$1,051.813 above the amount in the business plan.

Sustainability of the HFC phase-down and assessment of risks

71. Türkiye has implemented several measures to sustain the HFC reductions proposed under stage I of the KIP. These initiatives include integrating the Kigali Amendment and F-gases regulations into its national framework, establishing specific controls on the import and use of HFCs and HFC-containing equipment, and introducing a quota system aligned with the HFC phase-down schedule. Customs capabilities have been enhanced through targeted training programs to monitor and control HCFC and HFC imports effectively. Customs officers are now equipped to enforce compliance with the new regulations at key border points, building on the experience gained from the management of previously phased-out substances.

72. To ensure long-term sustainability of the HFC phase-down, Türkiye has prioritized capacity building for RAC technicians by expanding training and certification initiated under the HPMP, including promotion of safe practices with alternative refrigerants, and extending training to previously uncovered sectors. The government supports RRR centers by providing essential consumables, establishing cylinder tracking systems, and supplying R&R units for the refrigeration and MAC sectors. Effort have also been made to engage with local industry associations to further ensure understanding and integration of Montreal Protocol goals across the relevant sectors.

73. Identified risks to ensuring compliance with the HFC targets and implementing the KIP activities on time are potential HFC demand exceeding freeze limits in 2024-2025 before KIP activities start, and limited resources for the NOU to manage both the KIP (stage I) and the last tranche of the HPMP. To mitigate these, the quota system, awareness programs, and collaboration with UNDP, as cooperating agency for the KIP not involved in the HPMP, will support timely implementation. Strengthened stakeholder engagement and regular consultations will ensure their commitment to KIP activities. Accessibility of low-GWP technologies is not a concern, as Türkiye is an advanced adopter, and major technology changes are not planned in stage I. Any external challenges will be addressed through effective communication to maintain progress.

Impact on the climate

74. The activities proposed, including efforts to promote low-GWP alternatives and refrigerant recovery and reuse indicate that the implementation of stage I of the KIP will reduce refrigerant emissions into the atmosphere, resulting in climate benefits. A calculation of the impact on the climate of the activities in the KIP indicates that by 2029, Türkiye will have reduced its emissions by approximately five million CO₂-eq tonnes of HFCs, calculated as the difference between the HFC baseline for compliance and the 2029 consumption level proposed, assuming that all consumed HFCs would eventually have been emitted.

Draft Agreement

75. A draft Agreement between the Government of Türkiye 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.

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

VI. Recommendation

77. The Executive Committee may wish to consider:

- (a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for Türkiye for the period 2024-2029 to reduce HFC consumption by 14.4 per cent of the country's baseline by 2029, in the amount of US \$11,949,132, consisting of US \$8,326,287, plus agency support costs of US \$582,840, for UNIDO and US \$2,841,126, plus agency support costs of US \$198,879, for UNDP, as reflected in the schedule contained in annex I to the present document;
- (b) Noting:
 - (i) The strong commitment of the Government of Türkiye to support reductions in HFC consumption in advance of the Montreal Protocol targets;
 - (ii) That the Government of Türkiye will establish its starting point for sustained aggregate reductions in HFC consumption based on guidance provided by the Executive Committee;
 - (iii) That, once the cost guidelines for HFC phase-down are agreed by the Executive Committee, reductions from the country's remaining HFC consumption eligible for funding will be determined in line with these guidelines;
 - (iv) That the reductions from the country's remaining HFC consumption eligible for funding referred to in subparagraph (b)(iii) above will be deducted from the starting point referred to in subparagraph (b)(ii);
 - (v) That upon completion of the end-user projects in the commercial refrigeration and residential air-conditioning sectors included in stage I of the KIP, UNIDO 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);

- (vi) That, during the implementation of stage I of the KIP and no later than the 98th meeting, the Government of Türkiye would be allowed, on an exceptional basis, to submit investment projects in the refrigeration, air-conditioning and foam sector to achieve additional HFC reductions;
- (vii) That the Government of Türkiye would continue to monitor its HFC consumption to understand the extent to which reported consumption in the baseline years was representative of the local market's needs and to assess what future HFC demand would be, and would provide that analysis when submitting the investment projects referred to in paragraph (b)(vi);
- (viii) That, on the basis of the information provided in subparagraph (b)(vi) and (b)(vii) above, the maximum allowable consumption limits for the remaining years of stage I of the KIP, as contained in Appendix 2-A to the future Agreement between the Government of Türkiye and the Executive Committee would be revised when the investment projects referred to in paragraph (b)(vi) are submitted;
- (c) Approving the first tranche of stage I of the KIP for Türkiye and the corresponding tranche implementation plan, in the amount of US \$2,984,690, consisting of US \$1,943,985, plus agency support costs of US \$136,079 for UNIDO and US \$845,445, plus agency support costs of US \$59,181, for UNDP; and
- (d) Requesting the Government of Türkiye, UNIDO, UNDP and the Secretariat to finalize the draft Agreement between the Government of Türkiye 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 TÜRKİYE

Kigali HFC implementation plan (stage I)

Row	Particulars	2024	2025	2026	2027	2028	2029	Total
1.1	Montreal Protocol reduction schedule of Annex F substances (CO ₂ -eq tonnes)	37,117,410	37,117,410	37,117,410	37,117,410	37,117,410	33,405,669	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO ₂ -eq tonnes)	37,117,410	37,117,410	37,117,410	37,117,410	37,117,410	31,790,838	n/a
2.1	Lead IA (UNIDO) agreed funding (US \$)	1,943,985	0	0	5,262,222	0	1,120,080	8,326,287
2.2	Support costs for Lead IA (US \$)	136,079	0	0	368,356	0	78,406	582,840
2.3	Cooperating IA (UNDP) agreed funding (US \$)	845,445	0	0	1,637,040	0	358,641	2,841,126
2.4	Support costs for Cooperating IA (US \$)	59,181	0	0	114,593	0	25,105	198,879
3.1	Total agreed funding (US \$)	2,789,430	0	0	6,899,262	0	1,478,721	11,167,413
3.2	Total support costs (US \$)	195,260	0	0	482,948	0	103,510	781,719
3.3	Total agreed costs (US \$)	2,984,690	0	0	7,382,210	0	1,582,231	11,949,132

HCFC phase-out management plan (stage I) (years 2024-2025)

Row	Particulars	2024	2025	-	-	-	-	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	358.50	179.20					n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	10.00	0.00					n/a
2.1	Lead IA (UNIDO) agreed funding (US \$)	0	640,600					640,600
2.2	Support costs for Lead IA (US \$)	0	44,842					44,842
2.3	Cooperating IA (UNDP) agreed funding (US \$)	0	0					0
2.4	Support costs for Cooperating IA (US \$)	0	0					0
3.1	Total agreed funding (US \$)	0	640,600					640,600
3.2	Total support costs (US \$)	0	44,842					44,842
3.3	Total agreed costs (US \$)	0	685,442					685,442