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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-third Meeting
Montreal, 15-19 December 2023
Items 9(c) and (d) of the provisional agenda[1]

PROJECT PROPOSALS: NORTH MACEDONIA

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

Phase-out

- HCFC phase-out management plan (stage II, second tranche) UNIDO

Phase-down

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

[1] UNEP/OzL.Pro/ExCom/93/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

North Macedonia

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II)	UNIDO (lead)	88th	100% phase-out by 2028

(II) LATEST ARTICLE-7 DATA (Annex C Group l)	Year: 2022	0.09 ODP tonnes

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)									Year: 2022
Chemical	Aerosol	Foam	Fire-fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-22					0.09				0.09

(IV) CONSUMPTION DATA (ODP tonnes)			
2009-2010 baseline:	1.89	Starting point for sustained aggregate reductions:	3.35
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved:	2.18	Remaining:	1.17

(V) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
UNIDO	ODS phase-out (ODP tonnes)	0	0.48	0	0.48
	Funding (US $)	0	214,000	0	214,000

(VI) PROJECT DATA			2021	2022	2023*	2024	2025	2026	2027	2028	Total
Montreal Protocol consumption limits (ODP tonnes)			1.17	1.17	1.17	1.17	0.59	0.59	0.59	0.59	n/a
Maximum allowable consumption (ODP tonnes)			0.90	0.79	0.68	0.58	0.47	0.36	0.25	0	n/a
Funding agreed in principle (US $)	UNIDO	Project costs	120,000	0		200,000	0	118,750	0	48,750	487,500
		Support costs	8,400	0		14,000	0	8,313	0	3,413	34,125
Funds approved by ExCom (US $)		Project costs	120,000								120,000
		Support costs	8,400								8,400
Total funds recommended for approval at this meeting (US $)		Project costs			200,000						200,000
		Support costs			14,000						14,000

*The second tranche of stage II of the HPMP was scheduled to be submitted at the second meeting of 2024, but a request was made for the tranche in advance by one year due to the high level of implementation and disbursement

Secretariat's recommendation:	Blanket approval

PROJECT DESCRIPTION

1. On behalf of the Government of North Macedonia, UNIDO as the designated implementing agency has submitted a request for funding for the second tranche of stage II of the HCFC phase-out management plan (HPMP), in the amount of US $200,000, plus agency support costs of US $14,000.[2] The submission includes a progress report on the implementation of the first tranche and the tranche implementation plan for 2024 to 2025.

Report on HCFC consumption

2. The Government of North Macedonia reported a consumption of 0.09 ODP tonnes of HCFCs in 2022, which is 95 per cent below the HCFC baseline for compliance. The 2018-2022 HCFC consumption is shown in table 1.

Table 1. HCFC consumption in North Macedonia (2018-2022 Article 7 data)

HCFC-22	2018	2019	2020	2021	2022	Baseline
Metric tonnes (mt)	4.76	11.56	6.79	0.00	1.72	32.78
ODP tonnes	0.26	0.64	0.37	0.00	0.09	1.80

3. North Macedonia continued to maintain its HCFC consumption below the maximum allowable consumption under the Montreal Protocol and its Agreement with the Executive Committee as a result of activities in the servicing sector implemented under the HPMP, and the current 6 per cent annual reduction on the import quota of HCFCs, coupled with the environmental tax (€1/kg) on the import of HCFC-22. The decreased demand for HCFCs in the country was also supported by the introduction of refrigeration and air-conditioning (RAC) equipment based on HFCs/HFC blends and refrigerants with low or zero GWP, and a well-functioning recovery and recycling (R&R) scheme.

Country programme implementation report

4. The Government of North Macedonia reported HCFC sector consumption data under the 2022 country programme (CP) implementation report that is consistent with the data reported under Article 7 of the Montreal Protocol.

Status of implementation of stage I of the HCFC phase-out management plan

5. At the 88th meeting, the eleventh and final tranche of stage I was approved with the following proviso:[3] "Extended, on an exceptional basis, the completion date of stage I of the HPMP for North Macedonia until 31 December 2023 to allow the completion of the planned activities related to the development of a national plan for refrigerant waste management, on the understanding that no further extension would be requested." It was confirmed by UNIDO that stage I of the HPMP will be completed by 31 December 2023, in line with the extension approved by the Executive Committee.

[2] As per the letter of 12 September 2023 from the Ministry of Environment and Physical Planning of North Macedonia to UNIDO.

[3] Decision 88/40 and annex XIV of document UNEP/OzL.Pro/ExCom/88/79

Progress report on the implementation of the first tranche of stage II of the HCFC phase-out management plan

Legal framework

6. The Government of North Macedonia has established an operational licensing and quota system for the control of import and export of HCFCs; an Order entered into force on 20 May 2021 requiring a 50 per cent reduction from the country's baseline in 2021, 6 per cent annual reductions on HCFC import quotas between 2022-2027, and a complete ban from 1 January 2028. As of January 2021, North Macedonia has a ban on the import and export of HCFC-based equipment, and as of March 2021, a prohibition on the import and export of HCFC-141b bulk and contained in pre-blended polyols. The country has implemented a variety of regulations to support the HCFC phase-out, including mandatory logbooks for users of equipment containing 3 kg or more of HCFCs, labelling and recording of such equipment, requirements on R&R and minimization of emissions to the atmosphere. A regulation on the type of categories of licenses for managing refrigerants and products containing refrigerants entered into force in 2021, and in 2022, regulations on the form and content of the certificate to be granted when succeeding the professional examination on handling refrigerants and products containing refrigerants. An Order prohibiting HCFC trade will enter into force in January 2028.

Refrigeration servicing sector

7. The following activities were undertaken:

(a) *Upgrading the R&R scheme*: Continuing monitoring of the R&R scheme, including quantities of R&R refrigerants; a survey of existing R&R capacities was carried out (in total, 519 service technicians are registered in the National Ozone Unit's (NOU) database, of which around 20 per cent have participated in meetings and events held under the HPMP, and another 20 per cent are expected to undertake new training); criteria for the selection of the entities/service shops to be granted R&R equipment and the list of the equipment to be provided were defined; and 17 R&R machines and ancillary equipment[4] were purchased and distributed;

(b) *Establishment of the sustainable training centres and certification scheme*: The Ministry of Environment and Physical Planning (MoEPP) published a public call for entities interested in establishing a training centre, and adopted the necessary measures for this purpose (i.e., approvals for the centres performance, adoption of legislation and establishment of relevant procedures, etc.). Lists of training equipment for handling refrigerants (including HCFCs, HFCs, and refrigerants with low or zero GWP) and for demonstration units, which will be provided to the selected training centres, were prepared. Three training centres will be established by the end of the fourth quarter of 2023; and

(c) *Strengthening best practices to avoid illegal import and control of refrigerant quality*: An analysis of the institutional and legal setup for control of the substances/blends, and roles and responsibilities of the environmental inspectors and customs officers, as well as the procedure for issuing permits for import and export of controlled substances was undertaken; a gap analysis of the procedure that is currently applied by inspectors and customs was carried out; the NOU, RAC experts and representatives of the State Environmental Inspectorate (SEI) are drafting standard operating procedures for environmental and customs inspectors in the inspection of substances controlled by the Montreal Protocol and on-site inspections misdemeanour and criminal procedure. It is

[4] Recovery machines, valve manifold gauge sets, recovery cylinders, weighing scales, and pre-filter for recovery units.

expected that this will become a major tool in the prevention of illegal trade of controlled substances.

Project implementation and monitoring

8. The NOU and UNIDO coordinated and monitored the implementation of activities with the support of one national consultant. Of the US $15,000 approved, US $12,000 was disbursed: US $10,000 for a national consultant and US $2,000 for travel of the consultant to coordinate and oversee the implementation of the first tranche.

Level of fund disbursement

9. As of September 2023, of the US $120,000 approved for the first tranche, US $71,343 (59 per cent) had been disbursed for UNIDO. The balance of US $48,657 will be disbursed in 2024.

Implementation plan for the second tranche of stage II of the HCFC phase-out management plan

10. The following activities will be implemented between January 2024 and December 2025:

(a) *Upgrading the R&R scheme:* Monitoring the recovered and recycled quantities of HCFC-22 will be undertaken on a continuing basis by the NOU; entities to be granted R&R equipment will be selected, and 20 new sets of R&R equipment will be purchased and distributed to the selected entities (US $44,000 and US $30,657 from previous tranche);

(b) *Establishment of sustainable training centres and certification scheme:* The establishment of three training centres will be completed, and followed by a safety inspection and facility modification by an expert in the field. Training and reclamation equipment, including three reclamation machines and RAC servicing equipment, will be purchased and installed. A study tour to a European Union country will be organized for two staff members from each public school engaged in training activities, as well as training sessions on good practices in refrigerant management for the centres´ staff and technicians (US $135,000 and US $9,000 from previous tranche);

(c) *Strengthening best practices to avoid illegal import and control of refrigerant quality*: A scenario analysis and lessons learned on a case of illegal refrigerants confiscated by Customs will be prepared, and a workshop for its presentation, organised; training materials on best practices, labelling and harmonized system (HS) codes for customs officers, and a guide for proper refrigerant cylinder labelling will be developed; and training on labelling and HS codes will be held (US $6,000 and US $6,000 from previous tranche); and

(d) *Project monitoring*: The NOU and UNIDO will continue to coordinate and oversee the implementation of the second tranche of stage II of the HPMP, and support the purchasing and delivery of R&R kits and the development of criteria for the selection of institutions interested in becoming training centres (US $15,000 and US $3,000 from previous tranche).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Early submission

11. As per the Agreement between the Government of North Macedonia and the Executive Committee, the second tranche of stage II of the HPMP is only due at the 95th meeting, in 2024. Given the substantive progress and level of disbursement achieved so far, and upon consultation with the Secretariat, UNIDO submitted the present request in advance to the scheduled date. The Secretariat reviewed and recommends approval of the tranche based on the level of progress and disbursement achieved (59 per cent). Noting that postponing the approval of this tranche could disrupt the momentum of the implementation, and that after the approval of all projects and activities programmed in the business plan for this year, there would be sufficient funds for the approval of this tranche.

Progress report on the implementation of the first tranche of stage II of the HCFC phase-out management plan

Legal framework

12. The Government of North Macedonia issued HCFC import quotas for 2023 which are lower than the Montreal Protocol control targets and the targets set in its Agreement with the Executive Committee.

Refrigeration servicing sector

13. The development of training materials on best practices, labelling, and HS codes was planned to be delivered during the implementation of the first tranche. UNIDO informed that this could not be done as the NOU, the Customs Administration and SEI needed to work first on the harmonization of HS codes with the European Union. Multiple meetings took place during the first tranche on this matter, and the authorities are now ready to prepare the training materials in the upcoming months. The establishment of training centres was delayed, as authorities were working on the necessary procedures and authorisations. UNIDO informed that all procedures have been completed and three centres will be established within the last quarter of 2023.

Gender policy implementation

14. In line with the MLF gender mainstreaming policy, the implementation of stage II considers gender equality and women empowerment throughout the project cycle. The NOU works with stakeholders to define gender specific indicators in the planning, implementation, and reporting process of each component. Training activities and meetings organized by the NOU incorporate sessions on gender to further sensitize project staff and stakeholders on the importance of gender mainstreaming and women empowerment. RAC trainings will incorporate conclusions drawn from these meetings to attract more women to join the sector. Gender mainstreaming is also considered in the selection of consultants, implementation and project monitoring teams, and trainees in training programmes. Public awareness campaigns will incorporate gender aspect to get more females involved in the process of protecting the ozone layer, and the monitoring and reporting of gender mainstreaming activities will be enhanced, to ensure the afore mentioned goals are achieved.

Sustainability of the HCFC phase-out and assessment of risks

15. The functioning licensing and quota system in place in the country ensures the sustained control of HCFC imports. Imports continue to be well below the allocated quota. The enacted legislation and regulations that prohibit the consumption of substances phased out under the Montreal Protocol (no

HCFC-equipment has been imported in the country since 2012), and the final ban of HCFC trade to be applied since 1 January 2028 provide solid bases for the sustainability of the HPMP results. The continuous training of customs officers and environmental inspectors, which includes sessions on phased-out ODS, support illegal trade prevention. The Secretariat also notes that the establishment of training centres will support the sustainability of the certification scheme after the completion of the HPMP. The continued implementation of the R&R scheme and the activities being undertaken to further strengthen it, will ensure that the servicing needs of any remaining HCFC-22 equipment after 2028 can be met with recovered or reclaimed HCFC.

Conclusion

16. North Macedonia continues to be in compliance with the Montreal Protocol and the HCFC consumption targets specified in its Agreement with the Executive Committee; in 2022, consumption of HCFCs was below the country's Montreal Protocol target and lower than the maximum allowable consumption specified in the Agreement. The country has a functioning licensing and quota system and an operational R&R scheme, reporting an average of 30.4 mt of HCFC-22 recovered and recycled per year. The level of disbursement of the first tranche is 59 per cent. The Secretariat considers the approval of the second tranche at the present meeting as a meaningful mechanism to ensure continued implementation of planned activities. The activities so far implemented and those planned under the second tranche will continue to help the country meet its commitments.

RECOMMENDATION

17. The Fund Secretariat recommends that the Executive Committee note the progress report on the implementation of the first tranche of stage II of the HCFC phase-out management plan (HPMP) for North Macedonia; and further recommends blanket approval of the second tranche of stage II of the HPMP for North Macedonia, and the corresponding 2024-2025 tranche implementation plan, at the funding level shown in the table below.

	Project title	Project funding (US $)	Support costs (US $)	Implementing agency
(a)	HCFC phase-out management plan (stage II, second tranche)	200,000	14,000	UNIDO

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

North Macedonia

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

(II) LATEST ARTICLE 7 DATA (Annex F)	Year: 2022	403.23 mt	366,617 CO_2-eq tonnes

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (CO_2-eq tonnes)									Year: 2022
Chemical	Aerosol	Foam	Firefighting	AC and refrigeration			Solvent	Other	Total sector consumption
				Manufacturing*		Servicing			
				AC	Other				
HFC-32						911			911
HFC-134a					20,263	35,550			55,813**
HFC-152a		32,958							32,958
R-404A					44,824	59,295			104,118**
R-407C					14,936	16,515			31,450**
R-410A					4,676	36,928			41,604**
R-507A					2,431	22,077			24,508**

* Assembly of equipment
** Difference in total imports due to stockpiling

(IV) AVERAGE 2020-2022 HFC CONSUMPTION IN SERVICING	134.92 mt	328,591 CO_2-eq tonnes

(V) CONSUMPTION DATA (CO_2-eq tonnes)			
Baseline: average 2020-2022 HFC consumption plus 65% of HCFC baseline	397,842	Starting point for sustained aggregate reductions	TBD*
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved	0	Remaining	TBD*

* To be determined

(VI) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
UNIDO	HFC phase-down (CO_2-eq tonnes)	0	0	0	0
	Funding (US $)	48,150	0	0	48,150

(VII) PROJECT DATA			2023	2024	2025	2026	2027	2028	2029	Total
Consumption (CO_2-eq tonnes)	Montreal Protocol limits		n/a	397,842	397,842	397,842	397,842	397,842	358,058	n/a
	Maximum allowable		n/a	378,557	368,915	359,272	359,272	359,272	323,345	n/a
Amounts requested in principle (US $)	UNIDO	Project costs	103,555	0	0	90,445	0	22,000	0	216,000
		Support costs	9,320	0	0	8,140	0	1,980	0	19,440
Amounts recommended in principle (US $)	Total project costs		103,555	0	0	90,445	0	22,000	0	216,000
	Total support costs		9,320	0	0	8,140	0	1,980	0	19,440
	Total funds		112,875	0	0	98,585	0	23,980	0	235,440

(VIII) Request for approval of funding for the first tranche (2023)		
Implementing agency	**Funds recommended (US $)**	**Support costs (US $)**
UNIDO	103,555	9,320
Total	**103,555**	**9,320**

Secretariat's recommendation:	Individual consideration

PROJECT DESCRIPTION

18. On behalf of the Government of North Macedonia, UNIDO as the designated implementing agency has submitted a request for stage I of the Kigali HFC implementation plan (KIP), at the amount of US $216,000, plus agency support costs of US $19,440, as originally submitted.[5]

19. The implementation of stage I of the KIP will assist North Macedonia in meeting the freezing of HFC consumption in 2024 and the target of 10 per cent reduction of the average HFC consumption in the baseline years by 1 January 2029.

20. The first tranche of stage I of the KIP, being requested at this meeting, amounts to US $103,555, plus agency support costs of US $9,320 for UNIDO, as originally submitted.

Background

21. North Macedonia ratified all the amendments to the Montreal Protocol, including the Kigali Amendment on 12 March 2020. North Macedonia has an HCFC consumption baseline of 1.80 ODP tonnes or 32.78 mt and is set to completely phase out consumption of HCFCs by 1 January 2028.

Status of implementation of the HCFC phase-out management plan

22. Stage I of the HCFC phase-out management plan (HPMP) for North Macedonia was originally approved at the 60th meeting[6], was updated at the 67th meeting[7], and revised at the 86th meeting[8] to meet the 35 per cent reduction from the baseline by 2020, resulting in the phase-out of 2.18 ODP tonnes of HCFCs, at a total cost of US $1,136,955[9], plus agency support costs. Stage I will be completed by 31 December 2023, in line with the exceptional extension approved in decision 88/40[10], as confirmed by UNIDO.

23. Stage II of the HPMP for North Macedonia was approved at the 88th meeting[11] and will be completed by December 2029, as stipulated in the Agreement between the Government of North Macedonia and the Executive Committee. The request for the second tranche has been submitted to the present meeting (see paragraphs 11 and 16).

Status of implementation of HFC-related activities

24. At the 74th meeting, North Macedonia received funding to conduct a survey on the use of alternatives to ozone-depleting substances (ODSs) (US $40,000), which was completed in May 2017. At the 80th meeting, North Macedonia received funding to implement the enabling activities for HFC phase-down (US $95,000), which were completed in June 2020. These activities assisted the country inter alia in ratifying the Kigali Amendment; updating its licensing system to include HFCs and HFC blends; better understanding their imports of HFCs and equipment containing them and the related market trends;

[5] As per the letter of 18 August 2023 from the Ministry of Environment and Physical Planning of North Macedonia to UNIDO.
[6] Decision 60/38
[7] Decision 67/26
[8] Annex XVIII of UNEP/OzL.Pro/ExCom/86/100
[9] At the 83rd meeting, the funding was updated to reflect the return of US $30,000, plus agency support costs of US $2,250 due to Sileks withdrawing from the project (decision 83/26)
[10] At the 88th meeting, on an exceptional basis, stage I was extended until 31 December 2023 to allow the completion of the planned activities related to the development of a national plan for refrigerant waste management, on the understanding that no further extension would be requested (decision 88/40)
[11] Decision 88/53

reporting HFC import data under Article 7 of the Montreal Protocol; identifying capacity-building needs for various stakeholders including refrigeration technicians to support the transition to alternatives; and analyzing policy options to facilitate HFC phase-down.

Stage I of the Kigali HFC implementation plan

Policy, regulatory and institutional frameworks

25. As part of the MoEPP, the NOU coordinates the HFC phase-down activities in the country. The NOU will continue to perform the tasks it was delivering under the HPMP, inter alia coordinating the implementation of the KIP, collecting and reporting data on the consumption of controlled substances, operating the licensing system, and organizing training for customs officers and refrigeration technicians.

26. The Government of North Macedonia has implemented a mandatory licensing system for HFCs. The import of the controlled substances and equipment containing HFCs is allowed once a permit has been issued by the MoEPP. The regulations and the process for obtaining refrigerant import/export permits are in place, and permits are valid for six months. An environmental fee for HFCs and for the equipment containing HFCs will be implemented, and the amount of the fee will be determined depending on the GWP of the HFC imported. The quota system for Annex F substances will be in place following the adoption of the Draft Order limiting the HFC imports as of 1 January 2024. The draft Order on the ban of the import, production and placing on the market of RAC equipment containing HFCs inter alia includes a ban on the import, manufacture and placing on the market of domestic refrigerators and freezers that contain HFCs with GWP of 150 by 1 January 2028, and of stand-alone refrigerators and freezers that contain HFCs with a GWP of 2,500 or more by 1 January 2033; that latter threshold will be lowered to 150 by 1 January 2035.

27. In addition, draft amendments to the Law on Environment have been prepared, including extending the provisions on leak prevention, detection and control to HFCs; regulation of categories of licenses for management of refrigerants and products containing refrigerants; criteria for establishment of sustainable technician training centres, including minimum equipment requirements, a requirement for on-site practical testing as part of the technician certification in line with European Union (EU) requirements, and minimum educational requirements and experience for trainers. The rulebook on the procedure for R&R of ODS, has been revised to address HFCs. Six rulebooks were drafted or updated and are in the process of adoption. This includes the rulebook on recording and labelling of equipment containing HFCs.

HFC consumption

28. North Macedonia only imports HFCs for use in servicing, including for the local installation and assembly of RAC equipment, and for foam manufacturing; a small quantity is also used in the firefighting sector. HFC-134a, HFC-32, R-404A, R-407C, R-410A, R-407F and R-507A are used in the RAC servicing sector;[12] HFC-134a, R-404A, R-407C, R-410A and R-507A are used in the RAC local installation and assembly subsector;[13] HFC-152a is used to manufacture extruded polystyrene (XPS) foam; while HFC-227ea was imported for use in the firefighting sector in 2020. Table 2 presents the country's HFC consumption as reported under Article 7 to the Ozone Secretariat.

[12] In addition, a small quantity of HFC-245fa and HFC-125 were imported into the country for unspecified servicing uses.

[13] As further discussed in paragraph 60, consumption in the local installation and assembly subsector had been reported as manufacturing in the country's CP data reports but before finalisation of the present document the Government amended its 2020-2022 data reporting to include use that had originally been reported as "manufacturing", under the servicing sector.

Table 2. HFC consumption in North Macedonia (2020–2022 Article 7 data)

HFC	GWP*	2020	2021	2022	Share of HFC consumption in 2022 (%)
mt					
HFC-32	675	5.68	3.10	1.36	0
HFC-134a	1,430	48.71	57.00	60.59	15
HFC-152a	124	178.70	297.80	265.79	66
HFC-227ea	3,220	1.00	0.00	0.00	0
HFC-245fa	1,030	0.96	0.00	0.00	0
HFC-125	3,500	0.05	0.20	0.06	0
R-404A	3,922	49.39	45.70	45.28	11
R-407C	1,774	6.90	5.91	7.05	2
R-410A	2,088	23.74	16.30	19.10	5
R-507A	3,985	1.99	0.70	4.00	1
Total (mt)		**317.12**	**426.71**	**403.23**	**100**
CO_2-eq tonnes					
HFC-32	675	3,834	2,093	918	0
HFC-134a	1,430	69,655	81,510	86,644	24
HFC-152a	124	22,159	36,927	32,958	9
HFC-227ea	3,220	3,220	0	0	0
HFC-245fa	1,030	989	0	0	0
HFC-125	3,500	175	700	210	0
R-404A	3,922	193,688	179,217	177,570	48
R-407C	1,774	12,247	10,483	12,506	3
R-410A	2,086	49,557	34,026	39,871	11
R-507A	3,985	7,930	2,790	15,940	4
Total (CO_2-eq tonnes)		**363,454**	**347,746**	**366,617**	**100**

*Global warming potential

Country programme implementation report

29. The Government of North Macedonia reported its HFC sector consumption data in the 2022 country programme implementation report that is consistent with the data reported under Article 7 of the Montreal Protocol.

HFC distribution by sector

30. The foam sector is the highest user of HFCs in terms of metric tonnes (approximately double than the RAC servicing sector). However, since the foam sector uses only HFC-152a, which has a relatively low-GWP (124), the RAC servicing sector uses almost 10 times more of HFCs/blends than the foam sector in CO_2-eq tonnes for the RAC servicing sector versus 32,958 CO_2-eq tonnes for the foam sector in 2022.

31. Table 3 shows the estimated HFC needs for the RAC servicing and local installation and assembly subsector in 2022.

Table 3. Estimated HFC needs for the RAC servicing and local installation and assembly subsector (2022)[14]

	HFC-32	HFC-134a		R-404A		R-407C		R-410A		R-507A		Total		Total	Total of share (%)
	Svcng*	LI&A**	Svcng	LI&A	Svcng	LI&A	Svcng	LI&A	Svcng	LI&A	Svcng	LI&A	Svcng		
	mt														
Domestic refrigeration	0	0	0.52	0	0	0	0	0	0	0	0	0	0.52	0.52	0%
Commercial refrigeration	0	4.08	4.59	6.81	27.07	0	0	0	0	0	0	10.89	31.66	42.55	25%
Industrial refrigeration	0	5.79	1.33	3.71	6.75	0	0	0	0	0.59	2.22	10.09	10.3	20.39	12%
Transport refrigeration	0	0	5.02	0.72	3.57	0	0	0	0	0	0	0.72	8.59	9.31	5%
Stationary AC and heat pumps	4.49	0	16.8	0	0	8.39	11.08	2.22	31.63	0	0	10.61	64	74.61	43%
MAC	0	4.31	20.14	0	0	0	0	0	0	0	0	4.31	20.14	24.45	14%
Total	**4.49**	**14.18**	**48.40**	**11.24**	**37.39**	**8.39**	**11.08**	**2.22**	**31.63**	**0.59**	**2.22**	**36.62**	**135.21**	**171.83**	**100%**
	CO_2-eq tonnes														
Domestic refrigeration	-	-	744	-	-	-	-	-	-	-	-	-	744	744	0%
Commercial refrigeration	-	5,834	6,564	26,706	106,158	-	-	-	-	-	-	32,540	112,721	145,262	36%
Industrial refrigeration	-	8,280	1,902	14,549	26,471	-	-	-	-	2,351	8,847	25,180	37,219	62,399	16%
Transport refrigeration	-	-	7,179	2,824	14,000	-	-	-	-	-	-	2,824	21,179	24,002	6%
Stationary AC and heat pumps	3,031	-	24,024	-	-	14,883	19,654	4,634	66,028	-	-	19,517	112,737	132,253	33%
MAC	-	6,163	28,800	-	-	-	-	-	-	-	-	6,163	28,800	34,964	9%
Total	**3,031**	**20,277**	**69,212**	**44,079**	**146,629**	**14,883**	**19,654**	**4,634**	**66,028**	**2,351**	**8,847**	**86,224**	**313,400**	**399,624**	**100%**

* Servicing
** Local installation and assembly subsector

[14] As further discussed in paragraph 61 of the present document, the sectoral needs do not match the uses reported under the country's CP data reports.

Refrigeration and air-conditioning servicing sector

32. There are approximately 519 RAC servicing technicians and 172 RAC workshops in North Macedonia. Workshops employ on average of three technicians. There are many informal small workshops offering installation and maintenance services of RAC equipment. The Government has approved regulatory measures to control the leakage and emissions during servicing and improved procedures for R&R of refrigerants.

33. There are two vocational schools at which trainings for servicing technicians in the RAC sector were organized in the framework of the HPMP. As part of the HPMP, the "Guide for the secondary vocational schools on establishment of training centres" was developed, with the aim of assisting the establishment of modern and sustainable training centres by providing detailed information on training on sound refrigerant handling, servicing, and R&R. It describes the themes to be part of the training programme, lectures to be incorporated in the training, and includes the template to apply for authorization to conduct training for management of refrigerants and products containing refrigerants, as well as the list of materials that may be used in preparation for taking the first and second part of the exam for management of refrigerants and products containing refrigerants.

Domestic, commercial, industrial and transport refrigeration servicing

34. Servicing domestic refrigeration equipment accounts for the lowest use of HFCs in the servicing sector, i.e., representing only 0.20 per cent of the total. It is estimated that 26 per cent of the total population of domestic refrigerators and freezers for residential use and 16 per cent of those for non-residential use are charged with HFC-134a. The remaining refrigerators and freezers are charged with R-600a, and a minimum part with CFC-12. The import of HFC-134a-based refrigerators and freezers has decreased from 5,870 units in 2020 to 2,005 in 2022 (66 per cent decrease) over the past three years.

35. Commercial refrigeration is the largest user of HFCs (42.55 mt or 145,262 CO_2-eq tonnes in 2022) among all the subsectors (representing around 36 per cent of the total HFC use in servicing in CO_2-eq tonnes), even though the number of pieces of equipment is not the highest. This is due to the higher average refrigerant charge (up to 30 kg for the large central rack systems) and the higher leakage rates (up to 12 per cent), as well as due to the consumption associated with the first charge of locally assembled units (10.88 mt or 32,528 CO_2-eq tonnes in 2022 charged with HFC-134a and R-404A).

36. It is estimated that 50 per cent of the small stand-alone equipment, charged with HFC-134a and R-404A; 40 per cent of the condensing units, charged with HFC-134a and 60 per cent charged with R-404A; and 100 per cent from the large central rack systems, charged with HFC-134a and R-404A, were intended for use within the country, while the remaining quantities were for export.

37. In addition to local installation and assembly, there is import of commercial refrigeration applications charged with R-404A and HFC-134a. The imports of R-404A-based units have slightly increased over the past three years, while those based on HFC-134a have slightly decreased.

38. The largest use within the subsector was for the centralized systems, due to high share of equipment based on R-404A, which has a high GWP (3,922). The bank of HFCs in the population of commercial refrigeration units is estimated to 278.01 mt or 983,012 CO_2-eq tonnes. The imports of R-404A-based equipment (including second-hand appliances, mostly originating from countries within the European Union (EU)) have been growing over the last years. There is a remaining bank of units charged with HCFC-22; that bank has been decreasing in line with the January 2021 ban on the import of HCFC-based equipment.

39. The industrial refrigeration servicing subsector represents around 12 per cent of HFC use in the servicing sector (20.39 mt or 62,399 CO_2-eq tonnes in 2022). There are no large distributed systems and large secondary chiller systems but only small/medium-sized systems. Those units were not imported but are assembled and installed in the country. The servicing needs of all the refrigerants used in this subsector are distributed as follows: 66 per cent for R-404A; 22 per cent for R-507A and 12 per cent for HFC-134a. There is also a number of units charged with HCFC-22, i.e., 6 per cent of the total population in 2022 (a decrease from 10 per cent in 2020).

40. The transport refrigeration servicing subsector represents approximately 5 per cent of HFC use in servicing for 2022 (9.31 mt or 24,002 CO_2-eq tonnes). There are no intermodal containers and ships in North Macedonia. The majority of transport refrigeration units are imported (82 per cent, all charged with HFC-134a), while the assembling of the transport refrigeration applications in the country accounts for 18 per cent (all charged with R-404A). The main refrigerant in terms of mt is HFC-134a with servicing needs of 5.02 mt or 7,185 CO_2-eq tonnes, while R-404A has the higher share in terms of CO_2-eq tonnes, i.e., 3.57 mt or 14,005 CO_2-eq tonnes.

Residential and commercial air-conditioning servicing

41. In the stationary air-conditioning and heat pump subsector:

(a) Small split air-conditioning represents approximately 12 per cent of HFC use in servicing for 2022 (21.24 mt or 37,187 CO_2-eq tonnes). There has been a constant increase in the bank of HFC-based units over the past three years of around 4 per cent per year. The largest share of the HFC use is due to R-410A (67 per cent), followed by HFC-32 (21 per cent) and R-407C (12 per cent). The imports of R-410A-based units have decreased over the past three years by 42 per cent, while those of HFC-32-based units have increased by 30 per cent;

(b) Small self-contained air-conditioning accounts for only a minor component (0.3 per cent, i.e., 0.45 mt or 930 CO_2-eq tonnes) of HFC use in servicing, out of which 90 per cent belongs to R-410A, and the rest to R-407C. Import of HFC-based units increased in the past three years (approximately 3 per cent per year), while those charged with HCFC-22 have decreased and ceased as of 1 January 2021. Through-the-wall units are not used in North Macedonia, and there is no assembling of small self-contained air-conditioning appliances. In 2020-2022, portable condensing units and packed terminal units were imported, both applications charged with R-410A. In 2021 and 2022, there were portable systems charged with R-290 with the share of 5 per cent of the total population of portable units;

(c) Larger split air-conditioning and other types of air-to-air systems represent around 11 per cent of the total HFC use in servicing in 2022 (17.65 mt or 34,627 CO_2-eq tonnes), R-410A accounted for approximately 60 per cent of the use, with the remaining 40 per cent belonging to R-407C. Larger split air-conditioning and other types of air-to air systems are imported; in addition, larger single splits, multi-splits and variable refrigerant flow (VRF) systems are assembled and installed locally;

(d) Heat pumps represent around 9 per cent of the total HFC use in servicing in 2022 (15.03 mt or 24,427.15 CO_2-eq tonnes, and the entire quantity is used for the servicing needs, with HFC-134a accounting for 70 per cent in mt and 30 per cent with R-410A; and

(e) Chiller systems represent around 12 per cent of the total HFC use in servicing in 2022 (20.24 or 35,078 CO_2-eq tonnes, out of which 12.54 mt are used for servicing needs and 7.7 mt for local installation and assembly). The largest share of HFC use belongs to R-407C

with 48 per cent in terms of mt (9.75 mt), followed by HFC-134a with 31 per cent (6.27 mt) and 21 per cent for R-410A (4.22 mt). There is also a number of units charged with HCFC-22 (8 per cent of the total population, with the use of 0.95 mt or 1,771 CO_2-eq tonnes in 2022). There is assembling of chiller systems in the country.

Mobile air-conditioning servicing

42. This subsector represents around 14 per cent of HFC use in servicing in 2022 (24.45 mt or 34,964 CO_2-eq tones, out of which 4.31 mt were used in the assembly of MAC units for buses. There has been a constant increase in the bank of HFC-based units in the past three years (by approximately 7.5 per cent on average per year). The entire amount of the HFC use in the subsector is HFC-134a.

Local installation and assembly subsector[15]

43. The local installation and assembly subsector assembles commercial and industrial refrigeration equipment, transport refrigeration equipment in road vehicles, as well as larger single splits and multi splits, VRF systems and small and medium-sized chillers. The total number of units assembled in 2022 was: 658 pieces of small refrigeration units charged with HFC-134a and 1,456 pieces charged with R-404A; 89 pieces of small/medium-sized systems charged with HFC-134a, 57 pieces charged with R-404A and nine pieces with R-507A; 1,192 pieces of transport refrigeration equipment in road vehicles all charged with HFC-134a; 80 pieces of larger single splits and multi splits and VRF systems charged with R-407C and 186 pieces charged with R-410A; and 107 chillers all charged with R-407C. Altogether, this represented the use of 36.61 mt or 86,194 CO_2-eq tonnes of HFCs/blends in 2022. Local installation and assembly is undertaken by 15 enterprises, of which ten assemble customized RAC units and the remaining five enterprises assemble standardized equipment. In addition, one enterprise assembles MAC units for buses (charged with HFC-134a).

Foam sector

44. A single enterprise started manufacturing XPS foam using HFC-152a in 2016. This is the only use of HFC-152a in the country.

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

Overarching strategy

45. North Macedonia's KIP will be divided into three stages: stage I from 1 January 2024 to 31 December 2029 (six years), stage II from 1 January 2030 to 31 December 2039 (ten years) and stage III from 1 January 2040 to 31 December 2045 (six years). In the period 2024-2029, the Government commits to the implementation of the phase-down schedule that reduces its consumption by 10 per cent of the average HFC consumption in the baseline years, and is thus requesting 20 per cent more funding, in accordance with the Executive Committee decision 92/37. Stage I is proposed to be implemented simultaneously with the HPMP until 2028. Stage II includes a reduction by 30 per cent in 2035. Stage III includes a reduction by 50 per cent in 2040 and by 80 per cent in 2025.

[15] As further discussed in paragraph 60, the country had reported consumption in the local installation and assembly subsector as "manufacturing" in its CP data reports and thus in the submission. Before finalization of this document the Government amended its 2020-2022 data reporting to include that consumption under the servicing sector.

Established HFC baseline and proposed reductions

46. The Government of North Macedonia reported its Article 7 data for 2020-2022. By adding 65 per cent of the HCFC baseline (in CO_2-eq tonnes) to the average HFC consumption in 2020-2022, the established HFC baseline is 397,842 CO_2-eq tonnes, as shown in table 4.

Table 4. HFC baseline for North Macedonia (CO_2-eq tonnes)

Baseline calculation	2020	2021	2022
HFC annual consumption	363,454	347,746	366,617
HFC average consumption 2020-2022			359,272
HCFC baseline (65%)			38,570
HFC baseline			**397,842**

47. Table 5 below includes the HFC reductions proposed for stage I of the KIP and reflects the proposed accelerated HFC phase-down to achieve a consumption level that is 10 per cent below the average HFC consumption in the baseline years by 2029.

Table 5. HFC consumption limits proposed for stage I of the KIP for North Macedonia (CO_2-eq tonnes)

		2023	2024	2025	2026	2027	2028	2029
Montreal Protocol consumption limits		n/a	397,842	397,842	397,842	397,842	397,842	358,058
Estimated consumption under the KIP		n/a	378,557	368,915	359,272	359,272	359,272	323,345
Difference	CO_2-eq tonnes	n/a	19,285	28,928	38,570	38,570	38,570	34,713
	%	n/a	5	7	10	10	10	10
Estimated reductions from baseline by 2029 in CO_2-eq tonnes						**74,497**		

Proposed activities

48. HFC phase-down will be achieved through policy instruments, regulations and controls, import quotas and permits, price control through environmental taxes on HFCs and HFC-containing equipment, gradual bans on import of HFC-containing equipment and new HFCs installations, and further development of national standards for safety in dealing with toxic or flammable refrigerants. The objective will also be attained through the training of customs and enforcement officers and RAC technicians, including the operation of a certification scheme, to improve good servicing practices and reduce leakage, as well as the promotion of R&R, the promotion of low-GWP alternatives and improved data reporting thereon, and the engagement of all relevant stakeholders, while emphasising and mainstreaming gender considerations in all KIP activities.

49. The components of stage I of the KIP for North Macedonia, the activities to be implemented under each component and their cost are presented below:

(a) *Strengthening the legal and regulatory framework to support HFC phase-down* (US $32,500):

(i) Expansion and improvement of the licensing and quota system, which includes the update of the electronic system for issuance of import permits, the organization of workshops with importers on adding HFCs to the quota and quota distribution, and

the introduction of environmental fees for imports of HFCs and used HFC-based equipment;

(ii) Implementation of the ban on imports of HFC-based equipment, including meetings with importers and distributors to prepare them for import bans, an awareness-raising campaign on import bans, and a study on ways to diminish the demand for HFC-134a for servicing MAC systems in passenger cars;

(iii) Further work and adjustment of the legal framework and use of rulebooks, including the revision of legislation to include leakage detection systems for equipment containing fluorinated greenhouse gases in quantities of 500 CO_2-equivalent tonnes or more, and pre-charging of equipment with HFCs; and workshops with stakeholders on usage of updated/new rulebooks;

(iv) Data reporting, including the expansion of the NOU database, the organization of meetings with stakeholders on reporting obligations, work related to the monitoring and assessment of data reporting;

(v) The certification of servicing technicians and involvement of the informal sector, under which work will be done on the monitoring and support to the introduction and management of the technician certification scheme, and a sensitization programme for the informal sector about training and certification options;

(vi) Further development of codes of practice and standards on handling low-GWP technologies, including updating the study on codes of good practice and standards for the safe management of low-GWP technologies, and meetings with stakeholders to promote the above; writing, publishing and dissemination of a manual on good handling and safety practices for flammable refrigerants;

(vii) Awareness-raising campaigns targeted to female servicing technicians, importers, end-users, small and medium-sized enterprises and industries in the RAC sector on the topic of low-GWP and high-efficiency alternatives and their economic and environmental benefits. The NOU's YouTube channel will be increasingly used in these campaigns, as a dissemination and awareness-raising tool;

(b) *Capacity building of customs officers, environmental inspectors and importers* (US $14,000)*:*

(i) Four training sessions, targeting 200 customs officers and environmental inspectors on control and identification of HFCs and HFCs-based equipment, pertinent laws and regulations on imports, licensing and quota system, prevention of illegal trade through risk profiling and mislabelling of refrigerant cylinders, use of harmonized system (HS) codes for HFCs, blends and equipment, and monitoring and reporting of data;

(ii) Four information and awareness-raising workshops for economic operators (importers and distributors), on potential risks and dangers associated with the handling, storing and repackaging of certain refrigerants;

(c) *Capacity building of RAC technicians*: Ten training workshops, targeting 200 RAC technicians, on applying good practices in the RAC sector, recovery, recycling and reclamation of refrigerants (RRR), new low-GWP technologies, safety standards, leakage control, and energy efficiency (US $15,000);

(d) *Facilitating the introduction of low-GWP technologies* (US $32,000):

(i) Demonstration project in the commercial refrigeration subsector: It will start with a study by a refrigerant expert who will research and analyze the refrigeration volume needs and the potential targeted recipients. Drafting of technical specifications; purchase, delivery and installation of selected RAC equipment; and relevant training will follow. Meetings will be held with relevant stakeholders, such as representatives of owners and operators of facilities, importers, and RAC experts with the objective to replace installations based on R-404A with CO_2 or other relevant installations in supermarkets and larger commercial facilities;

(ii) Two detailed sectoral studies, on the consumption and use of HFCs in aerosol, solvent, firefighting and foam sectors; and on the consumption and use of HFCs in the RAC manufacturing and assembling sectors;

(e) *Strengthening technical and human capacities for refrigeration management* (US $112,890):

(i) R&R activities that are complementary to those planned for stage II of the HPMP, including the purchase of 10 sets of tools and equipment for R&R[16];

(ii) Rehabilitation of the training rooms where flammable refrigerants will be handled; and facility assessment, followed by necessary modifications and safety inspections to ensure the training rooms are up to international standards, for two vocational schools;

(iii) Supply of additional gas identifiers for customs officers and environmental inspectors to allow testing and analysis of imported refrigerant gases;

(iv) Provision of RAC servicing tools for low-GWP equipment to two training centres.

Project implementation, coordination and monitoring

50. The programme management and coordination tasks will be carried out by the NOU, which is designated by the Government as the entity accountable for the overall management, including financial and substantive elements of the implementation of the KIP. The KIP will have the same institutional structure of the HPMP. Under the HPMP, the NOU and UNIDO monitor activities, report on progress, and work with stakeholders to phase out HCFCs. The same coordination, monitoring and evaluation approach will be extended to stage I of the KIP. The cost of those activities amounts to US $9,610 (US $2,000 for local consultants, US $5,000 for travel, US $1,500 for meetings, and US $1,110 for other costs).

Gender policy implementation

51. Several activities to implement the Multilateral Fund gender mainstreaming policy have been pursued in North Macedonia since its adoption in 2019. The NOU has consulted stakeholders in order to develop strategies to track and encourage the participation of women in the HPMP activities. The sex-disaggregated data collected by the NOU show that approximately 4 per cent of the RAC servicing technicians, and 25 per cent of customs and enforcement officers trained as part of the HPMP are women. Approximately 60 women in the RAC field have participated in meetings, trainings or workshops in the period 2020-2022.

[16] This will include recycling machines, charging stations, manifolds, and cylinders.

52. Trainings and meetings organized by the NOU will incorporate sessions on gender to further sensitize project staff and stakeholders on the importance of gender mainstreaming and women empowerment. Gender mainstreaming will also be considered in the selection of consultants, implementation and project monitoring teams, and trainees in training programmes. Public awareness campaigns will incorporate gender aspects, and efforts to encourage recruitment of women. Sex-disaggregated data and qualitative information will be collected to track progress in complying with the Multilateral Fund gender policy. Building on the achievements already attained, further efforts will be made during Stage I of the KIP to encourage female trainees to be enrolled in vocational schools.

Total cost of stage I of the Kigali HFC implementation plan

53. The budget for stage I has been established at US $216,000. The cost of activities in the refrigeration servicing sector are established in line with decision 92/37.

54. The proposed activities and costs for stage I of the KIP are summarized in table 6.

Table 6. Proposed cost of activities to be implemented in stage I of the KIP for North Macedonia (US $)

Component/Activity	First tranche	Second tranche	Third tranche	Total
Strengthening of the legal and regulatory framework to support HFC phase-down				
1.1. Expanding and improving the licensing and quota system	3,000	0	0	3,000
1.2. Implementation of the ban on imports of HFC-based equipment	2,500	2,500	0	5,000
1.3. Further work on adjustment of legal framework, and use of Rulebooks	3,000	0	0	3,000
1.4. Data reporting	2,500	2,500	0	5,000
1.5. Certification of servicing technicians and involvement of informal sector	4,000	4,000	0	8,000
1.6. Further development of codes of practice and standards on handling low-GWP technologies	4,000	0	0	4,000
1.7. Targeted awareness-raising campaigns on HFCs and low-GWP technologies, including campaigns targeting women	2,500	2,000	0	4,500
Subtotal	**21,500**	**11,000**	**0**	**32,500**
Capacity building of RAC technicians				
2.1. Training for RAC technicians on good servicing practices	7,500	7,500	0	15,000
Subtotal	**7,500**	**7,500**	**0**	**15,000**
Capacity building of Customs officers, environmental inspectors and importers				
3.1. Training for Customs officers and environmental inspectors	5,000	5,000	0	10,000
3.2. Information and awareness-raising workshops for economic operators (importers and distributors)	2,000	2,000	0	4,000
Subtotal	**7,000**	**7,000**	**0**	**14,000**
Facilitating the introduction of low-GWP technologies				
4.1. Demonstration project in the commercial refrigeration subsector	2,000	1,000	21,000	24,000
4.2. Detailed sectoral studies	4,000	4,000	0	8,000
Subtotal	**6,000**	**5,000**	**21,000**	**32,000**
Strengthening of the technical and human capacities for refrigeration management				
5.1. R&R activities that are complementary to those already planned for stage II of the HPMP	6,000	6,000	0	12,000
5.2. Rehabilitation of the training rooms where flammable refrigerants will be handled	20,000	20,000	0	40,000
5.3. Supply of additional gas identifiers for Customs officers and environmental inspectors	9,000	9,000	0	18,000
5.4. Provision of RAC servicing tools for low-GWP equipment	21,445	21,445	0	42,890
Subtotal	**56,445**	**56,445**	**0**	**112,890**
Coordination, monitoring and evaluation				
Subtotal	**5,110**	**3,500**	**1,000**	**9,610**
Total	**103,555**	**90,445**	**22,000**	**216,000**

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

55. The implementation of the HPMP and the KIP will be simultaneous between 2024 and 2028. Activities for the phase-down of HFC consumption are designed to be harmonized with the phase-out of HCFC consumption to the extent possible, by identifying opportunities for complementary efforts and avoiding duplication.

56. The proposed schedule of phase-down commitments and funding tranches under stage I of the KIP and the schedule of phase-out commitments and funding tranches under stage II of the HPMP are presented in annex I. Annex II provides an overview of activities both for stage II of the HPMP (2021-2028) and stage I of the KIP (2024-2029), showing that some activities are a continuation of the HPMP activities. The requested budget for stage I of the KIP at US $216,000 is lower than the approved budget for stage II of the HPMP (US $487,500).

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

57. The first funding tranche of stage I of the KIP, in the total amount of US $103,555 will be implemented between January 2024 and December 2026 and will include the following activities:

(a) *Strengthening the legal and regulatory framework to support HFC phase-down*: The licensing and quota system will be broadened to include HFCs, introduce fees for the import of HFCs and for used equipment containing HFCs; importers and distributors will be prepared regarding the HFC-based equipment gradual ban; further work on the adjustments of the national legal framework will be implemented (i.e., to extend the provisions on leakage prevention, detection and control to HFCs; to include criteria for establishing sustainable technician training centres, including minimum equipment requirements, a requirement for on-site practical testing as part of the technician certification in line with EU requirements, and minimum educational requirements and experience for trainers), and workshops with stakeholders on the usage of the updated rulebooks will be organised. Activities will be carried out to strengthen the HFC data collection and reporting framework, and meetings will be held with stakeholders who need to report on data; a scheme for mandatory certification of servicing technicians will be introduced; technicians in the informal sector will be sensitized with a view to involve them in the training and certification options; codes of practice and standards on handling low-GWP technologies will be further developed; and awareness-raising campaigns on HFCs and low-GWP technologies, including campaigns targeting women, will be organised (US $21,500);

(b) *Capacity-building of RAC technicians*: Five training workshops to train 100 RAC technicians on applying good practices in the RAC sector, and RRR will be held. The training programme, to be delivered over two tranches, will be complementary to the programme developed for the HPMP, with special emphasis on new low-GWP technologies, safety standards, leakage control, energy efficiency and RRR (US $7,500);

(c) *Capacity-building of customs officers, environmental inspectors and importers*: Two training sessions, targeting 100 customs and enforcement officers, will be held on the control and identification of HFCs and HFCs-based equipment, pertinent laws and regulations on their imports, licensing and quota system, prevention of illegal trade through risk profiling and mislabelling of refrigerant cylinders, use of HS codes for HFCs, blends and equipment, and monitoring and reporting of data; and two awareness-raising workshops, targeting importers and distributors, on potential risks and dangers associated with the handling, storing and repackaging of certain refrigerants will be organized (US $7,000);

(d) *Facilitating the introduction of low-GWP technologies:* The commercial refrigeration subsector being the one with the highest usage of HFCs in the country, has been identified as the priority subsector to be addressed in stage I of the KIP. Groundwork towards the implementation of a demonstration project will start during the first tranche as well as the drafting of technical specifications. The demonstration project will consist of the replacement of installations based on R-404A with CO_2 or other relevant installations in supermarkets and larger commercial premises. To complete comprehensive surveys on HFC consumption and their sectoral distribution, at least one study on consumption and use of HFCs in aerosol, solvent, firefighting, and foam sectors will be carried out at the beginning of the first tranche (US $6,000);

(e) *Strengthening technical and human capacities for refrigeration management*: To complement the on-going R&R activities under the HPMP, five sets of tools and equipment for R&R will be provided to servicing workshops and secondary vocational schools. An expert will conduct assessments and safety inspections, and facility modifications will be undertaken when necessary to ensure training rooms are up to international standards, and based on defined technical specifications. To complement this activity, gas identifiers and RAC servicing tools for low-GWP equipment will be provided to training centres (US $56,445); and

(f) Project coordination and monitoring (US $5,110).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

58. The Secretariat reviewed stage I of the KIP for North Macedonia in light of the existing policies and guidelines of the Multilateral Fund, including decisions 91/38[17] and 92/37,[18] stage II of the HPMP, and the 2023-2025 business plan of the Multilateral Fund.

Overarching strategy

59. North Macedonia is proposing to phase-down its consumption of HFCs in advance of the Montreal Protocol control schedule. In line with decision 92/44, the Government has submitted a letter demonstrating a strong national level of commitment in place to support such reductions. This advanced commitment is consistent with the proactive measures the country undertook in its HPMP to phase-out its consumption of HCFCs in advance of the Montreal Protocol control schedule. The KIP includes meaningful measures that will enable the country to meet its proposed commitments and achieve sustainable reductions in HFC consumption, i.e., strengthening of the servicing sector and customs, adoption of better servicing practices, training on safe use of non-HFC refrigerants, control and monitoring of HFC consumption level, reducing demand for HFC-based equipment through a combination of awareness raising, policies for the adoption of low-/lower-GWP refrigerant-based equipment. Furthermore, the Government would implement policy instruments, regulations and environmental taxes on HFCs and HFC-containing equipment, gradual bans on import of HFC-containing equipment and new HFCs installations.

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

[18] Analysis of the level and modalities of funding for HFC phase-down in the refrigeration servicing sector.

Consumption

60. Before finalization of the present document, the Government amended its 2020-2022 data reporting to include use that had originally been reported as "manufacturing", under the servicing sector, as that use was associated with the local installation and assembly subsector. In particular, UNIDO confirmed that the enterprises in the subsector do not manufacture the key components needed for the final system but rather procure them and charge the assembled systems on site. The Government will continue to carefully track the consumption associated with the local installation and assembly subsector. This would help the country have the data necessary to submit a project in the local installation and assembly subsector in the future should the Executive Committee agree on guidelines and policies for that subsector.

61. While HFC consumption reported under Article 7 of the Montreal Protocol and under the country's CP data report were consistent, the annual sectoral uses reported under the CP data report differed from the reported consumption given stockpiling by importers. Those stockpiles are carefully monitored by the Government, and the country's CP data report includes reporting on those stockpiles.[19] The Secretariat further noted that the sectoral HFC uses included in the project submission differed from those reported under the country's CP data report. The Secretariat noted the sectoral uses estimated in the submission are based on the estimated bank of equipment installed in the country and the assumed leakage rates. Notwithstanding best efforts by UNIDO and the Government, this modeling exercise will have some uncertainties. The differences between the uses in the proposal and those in the CP report are 17 and 21 per cent in 2020 and 2021, which is within modeling uncertainties; in contrast, the 54 per cent difference in 2022 is higher than would be anticipated. At the time of finalization of the present document UNIDO and the Government were looking into the reasons for these differences. In the meantime, the Secretariat notes that the uses reported under the CP data report are consistently below those in the submission, further indicating that any stockpiling by importers is in line with expected needs in the country.

Proposed reductions

62. In the original proposal the country proposed targets that were at the average HFC consumption for 2020-2028, and a 10 per cent reduction from that level in 2029. The Secretariat, while noting the control targets proposed, that reflected the country's commendable commitment to the Montreal Protocol, and to environmental and climate protection, also noted that the country's economy and HFC consumption in 2020-2022 might have been affected by the COVID-19 pandemic, and asked whether the country had considered including a small buffer in 2024 and 2025, in case the HFC consumption in the baseline years had been unduly affected by the pandemic. The Government agreed to the 2024 target being chosen as the mid-point between the HFC baseline and the 2020-2022 average HFC consumption; and the 2025 target as the mid-point between that target and the 2020-2022 average HFC consumption.

Starting point for sustained reductions in HFC consumption

63. As shown in table 4 above, the established baseline for HFC consumption in North Macedonia is 397,842 CO_2-eq tonnes. The methodology to calculate the starting point for sustained reductions in HFC consumption 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.

Policy, regulatory and institutional frameworks

HFC licensing and quota system

64. North Macedonia has an established and enforceable national system of licensing to monitor HFC imports and exports in place. A draft Order limiting the HFC imports and defining a concrete schedule for

[19] Such reporting is provided in the "remarks" column of the CP data report.

the phase-down of consumption of Annex F substances in accordance with the Kigali Amendment is expected to enter into force on 1 January 2024. It will be implemented through the application of a quota system and will use the GWP as the measurement for consumption.

65. As according to the current legislation, refrigerants may be handled only by licensed legal or natural persons, a system of licensing for handling refrigerants has been established and is expected to soon become fully operational. Licenses will be valid for five years. A training centre is in the phase of approval by the MoEPP and being established, and is planned to become functional in the last quarter of 2023.

Technical and cost-related issues

Submission of an investment project to phase-out HFC-152a consumption during the implementation of the first tranche of stage I of the KIP

66. As the foam sector accounts for two thirds of the country's consumption in metric tonnes, the Government proposed to conduct an in-depth study of the sector in 2024 and to propose an investment project during the first tranche of stage I of the KIP to phase out the use of HFC-152a in the manufacture of XPS foam. The Secretariat recommends that the Executive Committee consider such a project proposal during the implementation of stage I on an exceptional basis given that the country has consumption of less than 360 mt of HFCs in the baseline years in servicing, and that the country is proposing reduction targets lower than those required under the Protocol, i.e., a 10 per cent reduction by 2029 of its average HFC consumption in the baseline years. It is understood that such a project would result in additional reductions from the country's remaining HFC consumption eligible for funding.

Total project cost

67. In accordance with decision 92/37(b)(ii) and taking into consideration that the country would achieve an HFC consumption level 10 per cent below the average HFC consumption in the baseline years, the total cost of stage I of the KIP has been agreed as submitted, in the amount of US $216,000.

68. The proposed scheduling of tranches did not comply with decision 62/17, as the second and final tranche would be submitted in 2028 rather than in 2029, the last year of the Agreement. However, North Macedonia is proposing targets in advance of the Montreal Protocol control schedule, the country's HFC consumption in servicing is below 360 mt, and requesting the final tranche in 2028 will allow the country to submit both the final tranche of the KIP and of the HPMP to the same meeting, thus allowing for coordinated activities and minimizing administrative and reporting burdens to the country. Accordingly, and on an exceptional basis, the Secretariat recommends the proposed tranche schedule.

Impact on the climate

69. 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 North Macedonia will achieve an annual emission reduction of 74,497 CO_2-eq tonnes of HFCs when the final target in stage I of the KIP is achieved, calculated based on the difference between the HFC baseline and the final target set in stage I.

Sustainability of the HFC phase-down and assessment of risks

70. The commitment and results of the activities under stage I of the KIP will be sustained over time with the implementation of the licensing and quota system for HFCs; consultations with importers, end users and other stakeholders on promoting the adoption of low-GWP alternatives to HFCs in different applications; implementation of new or amended regulations to reduce import of HFC-based equipment in

domestic and commercial refrigeration, and air-conditioning after consultations with national stakeholders, and the monitoring of implemented activities.

71. The Government will adopt actions to lower potential risks including through the implementation of a robust licensing and quota system for HFCs to control and monitor supply, as well as through the implementation of the activities under the KIP that aim at reducing the demand for HFCs.

72. Regarding the timeline for the ban on HFC-based domestic refrigerators (2028) and stand-alone commercial refrigeration equipment (2033), although the Secretariat recognizes that it takes some time for countries to complete the necessary regulatory processes to implement a ban, the timeline adopted indicates a rather late entry into force of the proposed bans given the ready availability of low-GWP technology for those applications, and that this would contribute to an increase in the installed base of equipment, and hence subsequent servicing needs. While this seems a manageable risk, the Secretariat is of the opinion that an earlier timeline would be better.

73. The risk of stakeholders not attaching sufficient importance or not committing to the KIP activities would be mitigated with the support of the KIP by strengthening collaboration among stakeholders and building trust through regular meetings and consultations with the NOU and the National Committee on Chemicals and Waste Management, and requesting commitment as early in the process as possible.

74. UNIDO and the Government have indicated they would address the low to medium risk of the country not having sufficient resources to implement stage I of the KIP and stage II of the HPMP at the same time through UNIDO putting in place a roadmap for the implementation of activities in coordination with the NOU and the National Committee on Chemicals and Waste Management.

Co-financing

75. During stage I of the KIP, the Government of North Macedonia will implement a demonstration project in the commercial refrigeration subsector as an incentive for importers to import climate-friendly low-GWP technologies, and in turn the project will generate co-financing from the participating enterprises.

2023-2025 business plan of the Multilateral Fund

76. UNIDO is requesting US $216,000, plus agency support costs, for the implementation of stage I of the KIP for North Macedonia. The total value of US $112,875, including agency support costs, requested for the period of 2023–2025, is US $64,725 above the amount in the business plan.

Draft Agreement

77. A draft Agreement between the Government of North Macedonia 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.

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

RECOMMENDATION

79. The Executive Committee may wish to consider:

(a) Approving, in principle, stage I of the Kigali HFC implementation plan (KIP) for North Macedonia for the period 2023-2029 to reduce HFC consumption by 18.7 per cent of the country's baseline by 2029 (i.e., 10 per cent from its average HFC consumption in the baseline years), in the amount of US $216,000, plus agency support costs of US $19,440 for UNIDO, as reflected in the schedule contained in annex I of the present document;

(b) Noting:

(i) That the Government of North Macedonia will establish its starting point for sustained aggregate reductions in HFC consumption based on guidance provided by the Executive Committee;

(ii) That, once the cost guidelines for HFC phase-down are agreed by the Executive Committee, the reductions from the country's remaining HFC consumption eligibility for funding will be determined in line with these guidelines;

(iii) That the reductions from the country's remaining HFC consumption eligible for funding referred to in subparagraph (b)(ii) above will be deducted from the starting point referred to in subparagraph (b)(i);

(iv) That during the implementation of stage I of the KIP, the Government of North Macedonia will be allowed on an exceptional basis to submit a project to phase out the consumption of HFC-152a in the extruded polystyrene foam manufacturing sector;

(c) Approving the first tranche of stage I of the KIP for North Macedonia, and the corresponding tranche implementation plan, in the amount of US $103,555, plus agency support costs of US $9,320, for UNIDO; and

(d) Requesting the Government of North Macedonia, UNIDO and the Secretariat to finalize the draft Agreement between the Government of North Macedonia 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 NORTH MACEDONIA

Kigali HFC implementation plan (stage I)

Row	Particulars	2023	2024	2025	2026	2027	2028	2029	Total
1.1	Montreal Protocol reduction schedule of Annex F substances (CO_2-eq tonnes)	n/a	397,842	397,842	397,842	397,842	397,842	358,058	n/a
1.2	Maximum allowable total consumption of Annex F substances (CO_2-eq tonnes)	n/a	378,557	368,915	359,272	359,272	359,272	323,345	n/a
2.1	Lead IA (UNIDO) agreed funding (US $)	103,555	0	0	90,445	0	22,000	0	**216,000**
2.2	Support costs for Lead IA (US $)	9,320	0	0	8,140	0	1,980	0	**19,440**
3.1	Total agreed funding (US $)	103,555	0	0	90,445	0	22,000	0	**216,000**
3.2	Total support costs (US $)	9,320	0	0	8,140	0	1,980	0	**19,440**
3.3	Total agreed costs (US $)	112,875	0	0	98,585	0	23,980	0	**235,440**

HCFC phase-out management plan (stage II)

Row	Particulars	2023	2024*	2025	2026	2027	2028	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	1.17	1.17	0.59	0.59	0.59	0.59	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	0.68	0.58	0.47	0.36	0.25	0	n/a
2.1	Lead IA (UNIDO) agreed funding (US $)	0	200,000	0	118,750	0	48,750	487,500
2.2	Support costs for Lead IA (US $)	0	14,000	0	8,313	0	3,413	34,125
3.1	Total agreed funding (US $)	0	200,000	0	118,750	0	48,750	487,500
3.2	Total support costs (US $)	0	14,000	0	8,313	0	3,413	34,125
3.3	Total agreed costs (US $)	0	214,000	0	127,063	0	52,163	521,625

*The second tranche of stage II of the HPMP was scheduled to be submitted at the second meeting of 2024. The Government requested the tranche in advance by one year due to the high level of implementation and disbursement.

Annex II

IMPLEMENTATION OF BOTH THE HCFC PHASE-OUT MANAGEMENT PLAN (HPMP) AND THE KIGALI HFC IMPLEMENTATION PLAN (KIP) IN NORTH MACEDONIA

Area of activities	HPMP stage II		KIP stage I	
	Activity	Cost (US $)	Activity	Cost (US $)
Legal and regulatory framework				
Expanding and improving the licensing and quota system			Update of the electronic system of issuance of import permits	1,000
			Workshops with importers on adding HFCs to the quota and quota distribution	1,000
			Introduction of environmental fees for imports of HFCs and used HFC-based equipment	1,000
Implementation of the ban on imports of HFC-based equipment			Meetings with importers and distributors on import bans	1,250
			Awareness-raising campaign on import bans	1,250
			Study on diminishing the demand for HFC-134a for servicing MAC systems in passenger cars by introducing a ban on placing on the market of such cars in North Macedonia, as well as ban on installation of such MAC systems in cars, in addition to other bans already envisaged	2,500
Further work on adjustment of legal framework, and use of Rulebooks			Further work on adjusting legal framework	1,000
			Workshops with stakeholders on usage of updated/new Rulebooks	2,000
Data reporting			Expansion of the NOU database	3,000
			Meetings with stakeholders who need to report data	1,000
			Monitoring and assessment of data reporting	1,000
Certification of servicing technicians and involvement of informal sector			Monitoring and support to the introduction and management of the technician certification scheme	6,000
			Sensitization programme for informal sector	2,000
Further development of codes of practice and standards on handling low-GWP technologies			Update on the study on codes of practice and standards for the safe management of low-GWP technologies	2,000
			Meetings with stakeholders	500
			Writing, publishing and dissemination of the publication (Manual on the Good Handling and Safety Practices for Flammable Refrigerants)	1,500
Targeted awareness-raising campaigns on HFCs and low-GWP technologies			Campaign targeting end-users, small and medium-sized enterprises and industries in the RAC sector on the topic of low-GWP and high-efficiency alternatives and their economic and environmental benefits, including awards	3,000

Area of activities	HPMP stage II		KIP stage I	
	Activity	**Cost (US $)**	**Activity**	**Cost (US $)**
Gender			Campaign targeting female servicing technicians, importers, and end-users with a particular emphasis on energy efficiency, as well as codes of practice and standards on flammability and toxicity of low-GWP alternatives	1,500
Capacity building of RAC technicians				
Training of RAC technicians			Training for 200 RAC technicians (10 workshops x US $1,500)	15,000
Capacity building of Customs officers, environmental inspectors and importers				
Training of Customs officers and environmental inspectors	Organize the training for Customs officers and environmental inspectors on best practices	5,000	Training for 200 Customs and enforcement officers (4 sessions x US $2,500)	10,000
	Train 80 Customs officers and environmental inspectors	24,000		
Information and awareness-raising workshops for economic operators (importers and distributors)			Awareness-raising meetings for economic operators (4 meetings x US $1,000)	4,000
Training materials and curricula	Develop training materials on best practices, labelling and HS codes	12,000		
Facilitating the introduction of low-GWP technologies				
Demonstration project in the commercial refrigeration subsector			Preparing the study on the project	2,000
			Drafting technical specifications	1,000
			Purchase, delivery and installation of selected RAC equipment	19,000
			Training on installation of such units	2,000
Detailed sectoral studies			Study of consumption and use of HFCs in aerosol, solvent, firefighting, and foam sectors (survey organization, consultant fees)	4,000
			Study of consumption and use of HFCs in the RAC manufacturing and assembling sectors (survey organization, consultant fees)	4,000
Strengthening technical and human capacities for refrigeration management				
Recovery and recycling scheme	Monitor the recovered and recycled quantities	7,000		
	Survey on the existing capacities for refrigerants recovery and recycling	5,000		
	Develop a plan for upgrading recovery and recycling (R&R) scheme	5,000		
	Define criteria for selection of the entities/service shops to be granted with R&R equipment	1,000		

Area of activities	HPMP stage II		KIP stage I	
	Activity	**Cost (US $)**	**Activity**	**Cost (US $)**
	Implementing the procedure for the stakeholders/entities selection (publishing a public announcement, establish a commission for selection of the entities to be granted)	2,000		
	Define a list of the equipment to be included in the R&R set	4,000		
	Purchase and distribute the R&R equipment	120,000	Purchase of additional 10 sets of tools and equipment for R&R (recycling machine, charging station, manifold, 3 cylinders) (10 x US $1,200)	12,000
	Organize training sessions including those specifically designed for female technicians and candidates; distribute R&R awards based on criteria developed in the eleventh tranche	5,000		
Rehabilitation of the training rooms where flammable refrigerants will be handled			Facility assessment, modification and safety inspections for 2 vocational schools (US $20,000 x2)	40,000
Supply of additional gas identifiers for Customs officers and environmental inspectors			Provision of 4 gas identifiers	18,000
Provision of RAC servicing tools for low-GWP equipment			Purchase of RAC servicing tools for low-GWP equipment for training centres (US $21,445 x 2)	42,890
Establishment of sustainable training centres	Create a list of the newly-established training centres	2,000		
	Make assessment of the training centres needs in regard to the training equipment	4,000		
	Define a list of the equipment to be included in the training set (training + reclamation equipment)	5,000		
	Purchase and install the training and reclamation equipment (including three reclamation machines for vocational centres)	111,000		
	Organize study tour to training centre in the European Union country	12,000		
	Organize safety inspection and facility modification by expert at the training centres	12,000		

Area of activities	HPMP stage II		KIP stage I	
	Activity	**Cost (US $)**	**Activity**	**Cost (US $)**
	Organize the training on how to operate the training and reclamation equipment including those specifically designed for female technicians and candidates	5,000		
	Organize training for service providers on business models for reclamation	5,500		
	Train 270 service technicians on good service practice in the national training centres	81,000		
Project coordination and management				
Project coordination and management	Recruitment of two national experts	60,000	Fees for locally recruited consultants, travel for the NOU and others, meetings by the NOU, other costs	9,610
Total		**487,500**		**216,000**