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

PROJECT PROPOSAL: BAHRAIN

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

Phase-out

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

¹ UNEP/OzL.Pro/ExCom/93/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Bahrain

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II)	UNEP (lead), UNIDO	88 th	73.5% phase-out by 2025

(II) LATEST ARTICLE-7 DATA (Annex C Group I)	Year: 2022	25.51 ODP tonnes
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(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				9.27	16.25				25.51
HCFC-141b in imported pre-blended polyol		17.15							17.15

(IV) CONSUMPTION DATA (ODP tonnes)			
2009-2010 baseline:	51.90	Starting point for sustained aggregate reductions:	61.39
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved:	58.64	Remaining:	2.75

(V) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
UNEP	ODS phase-out (ODP tonnes)	4.87	3.37	0.00	8.24
	Funding (US \$)	89,835	62,150	0	151,985
UNIDO	ODS phase-out (ODP tonnes)	3.31	1.29	0.00	4.60
	Funding (US \$)	57,780	22,470	0	80,250

(VI) PROJECT DATA		2021	2022	2023	2024	2025	Total	
Montreal Protocol consumption limits (ODP tonnes)		33.74	33.74	33.74	33.74	16.87	n/a	
Maximum allowable consumption (ODP tonnes)		33.74	30.45	30.00	29.50	13.75	n/a	
Funding agreed in principle (US \$)	UNEP	Project costs	249,500	0	79,500	55,000	0	384,000
		Support costs	32,435	0	10,335	7,150	0	49,920
	UNIDO	Project costs	203,999	0	54,000	21,000	0	278,999
		Support costs	14,280	0	3,780	1,470	0	19,530
Funds approved by ExCom (US \$)	Project costs	453,499					453,499	
	Support costs	46,715					46,715	
Total funds recommended for approval at this meeting (US \$)	Project costs			133,500			133,500	
	Support costs			14,115			14,115	

Secretariat's recommendation:	Blanket approval
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PROJECT DESCRIPTION

1. On behalf of the Government of Bahrain, UNEP as the lead implementing agency has submitted a request for funding for the second tranche of stage II of the HCFC phase-out management plan (HPMP), at a total cost of US \$147,615, consisting of US \$79,500, plus agency support costs of US \$10,335, for UNEP and US \$54,000, plus agency support costs of US \$3,780, for UNIDO.² The submission includes a progress report on the implementation of the first tranche, a verification report on HCFC consumption for 2021 and 2022, and the tranche implementation plan for 2024 to 2025.

Report on HCFC consumption

2. The Government of Bahrain reported a consumption of 25.51 ODP tonnes of HCFCs in 2022, which is 50 per cent below the HCFC baseline for compliance. The 2018-2022 HCFC consumption is shown in table 1.

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

HCFC	2018	2019	2020	2021	2022	Baseline
Metric tonnes (mt)						
HCFC-22	735.15	669.44	595.55	447.38	463.90	935.80
HCFC-141b	1.94	2.01	0.00	0.00	0.00	4.00
Total (mt)	737.09	671.45	595.55	447.38	463.90	939.70
HCFC-141b in imported pre-blended polyols*	192.44	125.54	89.82	115.18	155.90	91.87**
ODP tonnes						
HCFC-22	40.43	36.82	32.76	24.61	25.51	51.50
HCFC-141b	0.21	0.22	0.00	0.00	0.00	0.40
Total (ODP tonnes)	40.65	37.04	32.76	24.61	25.51	51.90
HCFC-141b in imported pre-blended polyols*	21.17	13.81	9.88	12.67	17.15	10.11**

* Country programme (CP) data

** Average consumption between 2007 and 2009

3. HCFC consumption in Bahrain has been decreasing due to the enforcement of the licensing and quota system, the conversion of the HCFC-22-based air-conditioning (AC) manufacturing sector to non-HCFC-based alternatives, the introduction of refrigeration and air-conditioning (RAC) equipment based on alternative refrigerants, and the implementation of phase-out activities related to the refrigeration servicing sector under stage I of the HPMP. The particularly low consumption in 2021 and 2022 may be attributed to the COVID-19 pandemic.

4. The import of HCFC-141b contained in pre-blended polyols had been decreasing until 2020, then increased in 2021 and 2022. This was mostly attributed to the boom in the building sector after COVID-19.

Country programme implementation report

5. The Government of Bahrain reported HCFC sector consumption data under the 2022 CP implementation report that is consistent with the data reported under Article 7 of the Montreal Protocol.

Verification report

6. The verification report confirmed that the Government was implementing a licensing and quota system for HCFC imports and exports and that the total consumption of HCFCs reported under Article 7 of the Montreal Protocol for 2021 and 2022 was correct (as shown in table 1 above). The verification

² As per the letter of 25 September 2023 from the Supreme Council for Environment of Bahrain to UNEP.

concluded that Bahrain was in compliance with the allowable consumption established in the Agreement with the Executive Committee.

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

7. Stage I of the HPMP was completed in December 2021, as stipulated in the Agreement between the Government of Bahrain and the Executive Committee. The project completion report was submitted on 19 April 2022.

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

Legal framework

8. The Government has issued Law 54/2014 to enforce the Unified Regulation of the Gulf Cooperation Council for Arabian Gulf States (GCC). This regulation was set up to control the import, export, trade, transfer, storage, and disposal of ozone-depleting substances (ODS) and ODS-based equipment among GCC countries and to replace them with safe alternatives. Law 54/2014 mandates the Supreme Council for Environment of Bahrain (SCE) to issue the respective bylaws.

9. The Government has established an operational licensing and quota system which has been extended to HFCs; developed an e-licensing system; banned the imports of HCFC-based central cooling refrigeration units; used RAC units and portable non-refillable refrigerant cylinders as of 1 January 2020; banned the import of HCFC-141b pure as of 1 January 2021; introduced international safety standards and codes for flammable and toxic refrigerants; developed three standards for refillable cylinders, and labelling requirements for refilling and for the reclamation of refrigerants; developed a registration form and record-keeping log to monitor HCFC consumption; set codes for the handling and disposal of refrigerant cylinders; and established procedures for mandatory certification of refrigeration technicians and servicing enterprises. The licensing system includes HFCs on a voluntary basis to enable the national ozone unit (NOU) to collect data on their imports; however, a quota is not yet being applied to HFCs.

10. The Government is working towards banning the import and use of HCFC-141b contained in pre-blended polyols, and the import and manufacture of HCFC-22-based AC equipment, by 1 January 2025.

Foam manufacturing sector conversions

11. The project was approved at a total amount of US \$116,999 to completely phase out 135.93 mt of HCFC-141b contained in imported pre-blended polyols in the foam sector. The project includes the conversion of two polyurethane (PU) insulation foam enterprises to HFO technology, the conversion of two spray foam enterprises to water-blown or methyl formate technology, and the provision of technical assistance to non-eligible enterprises for sector phase-out.

12. For the conversions of PU foam manufacturing at Awal Gulf Manufacturing (AGM) and Awal Refrigeration and Air-Conditioning, an international foam expert was hired to provide technical assistance in product design and optimization. Draft technical specifications were prepared by UNIDO and have been sent to the NOU for comments and input. The procurement of chemicals based on HFO technology is in progress. Once the chemicals have been delivered, the foam expert will assist in the testing of four formulations for the two enterprises.

13. The NOU has coordinated with the spray foam manufacturing enterprises on the supply of chemicals for alternative technologies. In November 2022, UNIDO and a technical expert visited the manufacturing enterprises. Subsequently, the technical specifications for testing of formulations for Al

Khonaizi and Al Manai were developed; chemicals based on methyl formate technology were procured. Delivery and customs clearance were expected by the end of 2023.

14. A two-day training workshop was organized in November 2022 to provide technical assistance and information on the alternative technologies suitable for small injection foam operations in local conditions. Industrial stakeholders, spray foam enterprises, suppliers, importers/traders, and beneficiary enterprises attended the workshop. The NOU highlighted the requirements of the Montreal Protocol, the deadline for phasing out HCFC-141b in Bahrain and the upcoming ban on the import and use of HCFC-141b contained in imported pre-blended polyols by 1 January 2025. UNIDO's expert presented the available substitute technologies for different foam applications.

Refrigeration servicing sector

15. The following activities were implemented in the RAC servicing sector:

- (a) Organized one awareness workshop for 400 participants on new GCC regulations related to the Kigali Amendment and preparing new bylaws for upcoming commitments and alternative technologies; organized two coordination meetings with the Testing and Metrology Directorate and the Ministry of Interior to discuss the requirements for updating the national legislation and bylaws; updated the NOU procedures and requirements related to importing RAC equipment based on flammable technologies to ensure safety; and updated the e-licensing system and created a database for certified workshops and technicians;
- (b) Provided training to 40 newly recruited customs officers on the Kigali Amendment, the control and monitoring of imports, handling of containers with flammable and toxic refrigerants, identification of refrigerants, and prevention of illegal imports; provided training to 40 enforcement officers on law enforcement past the customs check point; and provided training to 42 importers and clearing agents on the Kigali Amendment and the baseline and its implications;
- (c) Updated the curriculum and syllabus for training institutions and vocational training centres to include low-global-warming-potential (GWP) alternatives (hydrocarbon and ammonia); and provided training to 17 trainers and 40 technicians on Montreal Protocol requirements, good servicing practices, thermodynamic theory, alternative technologies, safety, and refrigerant recovery and reclamation;
- (d) Updated the national qualification framework and the national occupational competency standards to include flammable refrigerants; and updated evaluation criteria to include refrigerant recovery; trained five assessors and certified 40 RAC technicians for environmental refrigerant licences including flammable refrigerants; and
- (e) Procured equipment and tools and delivered them to training institutions, qualification-assessment-awarding institutions and the national laboratory to support training, certification, and refrigerant recovery, recycling and reclamation (e.g., window and split AC training units, leak detectors, refrigerant cylinders, refilling cylinders for oxygen, acetylene, and nitrogen).

Project implementation and monitoring

16. The project management unit (PMU) implements the activities, monitors progress and reports achievements. The total expenditure of the PMU in the first tranche amounts to US \$28,000 with the following breakdown: staff and consultants (US \$20,000); meetings and workshops (US \$8,000).

Level of fund disbursement

17. As of September 2023, of the US \$453,499 approved so far (US \$249,500 for UNEP and US \$203,999 for UNIDO), US \$417,116 (92 per cent) had been disbursed (US \$249,500 for UNEP and US \$167,616 for UNIDO). The balance of US \$36,383 will be disbursed in 2024.

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

18. The following activities will be implemented between January 2024 and December 2025:
- (a) Completion of the umbrella project to phase out HCFC-141b contained in imported pre-blended polyols in the commercial refrigeration foam and spray foam sector (UNIDO) (balance from the previous tranche);
 - (b) Continuing the targeted awareness campaigns aimed at Government authorities and relevant stakeholders about the introduction and enforcement of the new GCC regulations; and continuing to improve the e-licensing and monitoring system (UNEP) (US \$14,000);
 - (c) Providing training to 40 new customs officers on Montreal Protocol and HCFC import controls including risk profiling and the operation of the e-licensing system (UNEP) (US \$6,000);
 - (d) Providing training to 40 technicians on RAC good servicing practices, refrigerant recovery and recycling, and the safe handling of flammable refrigerants in collaboration with local training institutes (UNEP) (US \$19,500);
 - (e) Continuing to provide technical assistance to large end users to reduce refrigerant leakages and encourage the transition to non-ODS and long-term alternatives through awareness raising, and providing information and training; enhancing the registration system for large RAC systems for easy tracking and monitoring leakage; continuing to promote HCFC phase-out and the use of low-GWP alternatives through information dissemination (UNEP) (US \$15,500);
 - (f) Providing training tools and equipment (e.g., manifold, pressure gauge, vacuum pumps, leak detectors, recovery unit, tools) to training institutions, qualification-assessment-awarding institutes, and certified technicians (UNIDO) (US \$54,000); and
 - (g) Project implementation, monitoring and reporting (UNEP) (US \$24,500) for consultants and staff, including: US \$5,000 for a project manager, US \$14,000 for four specialists, and US \$5,500 for administration and financial management.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

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

Legal framework

19. The Government of Bahrain has already issued HCFC import quotas for 2023 at 30.00 ODP tonnes, which is lower than the Montreal Protocol control target and in line with the target set in its Agreement

with the Executive Committee. The 2024 quota will also be issued in line with the target set in its Agreement with the Executive Committee.

Manufacturing sector

20. Noting the increase in the import of HCFCs, the Secretariat enquired about the progress in establishing the bans on the import and use of HCFC-141b contained in pre-blended polyols and the import and manufacturing of HCFC-22-based AC equipment by 1 January 2025 as required in decision 88/45(d)(ii) and asked if there were any foreseen challenges. UNEP reported that several workshops have been held to raise awareness and prepare the sectors for the planned bans. All customs officers have been trained and made well aware of the upcoming 2025 bans on HCFCs and equipment containing them. The NOU is also working closely with all traders of RAC equipment to ensure full compliance with the agreed targets. The Government is confident that it will remain in compliance with the Montreal Protocol control targets and those in the Agreement with the Executive Committee. The bans are expected to be effective and enforced as originally planned.

21. With regard to the complete phase-out of HCFC-22 in RAC equipment manufacturing at AGM, UNEP reported that AGM is committed to stopping the production of RAC equipment using HCFC-22 in 2025 and that this commitment is under full control and monitoring by the NOU and the SCE. The consumption of HCFC-22 by AGM is gradually decreasing, from 300 mt in 2020 to 212 mt in 2021 and to 168.5 mt in 2022. In 2023, AGM stopped production using HCFC-22 on most lines except for the lines producing window units; and their HCFC-22 consumption in 2023 is expected to be less than 30 mt. The enterprise is working closely with the NOU to ensure compliance with the ban on HCFC-22 in the manufacturing sector by 1 January 2025.

Refrigeration servicing sector

22. The activities in the servicing sector are implemented to support the introduction of low-GWP technologies, including hydrocarbons. The relevant standards and operational procedures have been updated to include safety considerations. The training for mandatory certification of technicians is tailored to the needs and capacity of technicians to ensure skill transfer and the efficient use of resources. The activities implemented are expected to prepare the RAC sector to adopt low-GWP technologies and increase their penetration.

Gender policy implementation

23. The Government of Bahrain recognizes the importance of gender equality and women's empowerment and involvement during the implementation of the international and national programmes. The NOU ensures the participation of women in all activities, including the training of customs officers and technicians, the certification programme, and capacity-building programmes, as well as in outreach activities where possible under the HPMP. The NOU will sensitize main stakeholders in HPMP implementation (the SCE, Association of Refrigeration Technicians, customs department, etc.) on the gender mainstreaming policy of the Multilateral Fund and the relevant performance indicators and seek their input on how to integrate gender-specific indicators into the planning, implementation, and reporting process for each component.

Sustainability of the HCFC phase-out and assessment of risks

24. The Government of Bahrain has an enforceable licensing and quota system and has banned the import of HCFC-based central cooling refrigeration units, used RAC units and portable non-refillable refrigerant cylinders as of 1 January 2020; and has banned the import of HCFC-141b pure as of 1 January 2021. The Government is working towards banning the import and use of HCFC-141b contained in pre-blended polyols, and the import and manufacture of HCFC-22-based AC equipment, by

1 January 2025. The country is implementing a mandatory technician certification programme and has included low-GWP refrigerant in the certification system to support the adoption of these technologies. The training curriculum is reviewed and updated regularly to include the latest issues. The enforcement of the updated GCC regulations will ensure the sustainability of HCFC phase-out. The potential risk of non-compliance with the 2025 target was discussed in view of the large AC manufacturing capacity at AGM which has not been converted, as discussed in paragraphs 20 to 21. The Government assured that the consumption at AGM is closely monitored; and the activities being implemented under the HPMP will ensure the country remain in compliance.

Conclusion

25. Bahrain has achieved the control targets in its Agreement with the Executive Committee and under the Montreal Protocol. The country is effectively enforcing a licensing and quota system to control the import of HCFCs and equipment and is working to establish the ban on the manufacture and import of HCFC-22-based RAC equipment and on the import of HCFC-141b contained in pre-blended polyols by 1 January 2025. The project for phasing out HCFC-141b polyols is progressing to support the transition of the foam sector to alternatives. Standards, operating procedures and training curriculum have been updated to incorporate safety considerations related to low-GWP refrigerants for their adoption. Equipment and tools have been provided to support the training and mandatory certification of technicians. The disbursement of the first tranche is at 92 per cent.

RECOMMENDATION

26. 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 Bahrain, and further recommends blanket approval of the second tranche of stage II of the HPMP and the corresponding 2024-2025 tranche implementation plan for Bahrain at the funding levels 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)	79,500	10,335	UNEP
(b)	HCFC phase-out management plan (stage II, second tranche)	54,000	3,780	UNIDO