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EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Eighty-eighth Meeting  
Montreal, 15-19 November 2021<sup>1</sup>

**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, first tranche) UNEP and UNIDO

<sup>1</sup> Online meetings and an intersessional approval process will be held in November and December 2021 due to coronavirus disease (COVID-19)

## PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

## BAHRAIN

<b>(I) PROJECT TITLE</b>	<b>AGENCY</b>
HCFC phase-out plan (stage II)	UNEP (lead), UNIDO

<b>(II) LATEST ARTICLE 7 DATA (Annex C Group I)</b>	Year: 2020	32.76 (ODP tonnes)
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<b>(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)</b>								<b>Year: 2020</b>	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-22				16.50	15.95				32.45
HCFC-141b in imported pre-blended polyol		9.88							9.88

<b>(IV) CONSUMPTION DATA (ODP tonnes)</b>			
2009 - 2010 baseline:	51.9	Starting point for sustained aggregate reductions:	61.39
<b>CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)</b>			
Already approved:	18.03	Remaining:	43.36

<b>(V) BUSINESS PLAN</b>		<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
UNEP	ODS phase-out (ODP tonnes)	2.50	0	2.50	5.00
	Funding (US \$)	246,550	0	246,550	493,100
UNIDO	ODS phase-out (ODP tonnes)	5.38	0	2.89	8.27
	Funding (US \$)	634,992	0	444,963	1,079,955

<b>(VI) PROJECT DATA</b>			<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>Total</b>
Montreal Protocol consumption limits			33.74	33.74	33.74	33.74	16.87	n/a
Maximum allowable consumption (ODP tonnes)			33.74	33.74	33.74	33.74	13.75	n/a
Project costs requested in principle (US \$)	UNEP	Project costs	249,500	0	79,500	0	55,000	384,000
		Support costs	32,435	0	10,335	0	7,150	49,920
	UNIDO	Project costs	203,999	0	54,000	0	21,000	278,999
		Support costs	14,280	0	3,780	0	1,470	19,530
Total project costs requested in principle (US \$)			453,499	0	133,500	0	76,000	662,999
Total support costs requested in principle (US \$)			46,715	0	14,115	0	8,620	69,450
Total funds requested in principle (US \$)			500,214	0	147,615	0	84,620	732,449

<b>(VII) Request for approval of funding for the first tranche (2021)</b>		
<b>Agency</b>	<b>Funds requested (US \$)</b>	<b>Support costs (US \$)</b>
UNEP	249,500	32,435
UNIDO	203,999	14,280
Total	453,499	46,715

<b>Secretariat's recommendation:</b>	Individual consideration
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## PROJECT DESCRIPTION

### Background

1. On behalf of the Government of Bahrain, UNEP as the lead implementing agency, has submitted a request for stage II of the HCFC phase-out management plan (HPMP), at a total cost of US \$732,449, consisting of US \$384,000, plus agency support costs of US \$49,920 for UNEP, and US \$278,999, plus agency support costs of US \$19,530 for UNIDO, as originally submitted.<sup>2</sup> The implementation of stage II of the HPMP will phase out 40.61 ODP tonnes of HCFCs and assist Bahrain in meeting the target of 67.5 per cent reduction in HCFC baseline consumption by 2025.

2. The first tranche of stage II of the HPMP being requested at this meeting amounts to US \$561,309, consisting of US \$278,000, plus agency support costs of US \$36,140 for UNEP, and US \$230,999, plus agency support costs of US \$16,170 for UNIDO, as originally submitted.

### Status of implementation of stage I of the HPMP

3. Stage I of the HPMP for Bahrain was originally approved at the 68<sup>th</sup> meeting,<sup>3</sup> updated at the 80<sup>th</sup> meeting<sup>4</sup> and revised at the 84<sup>th</sup> meeting<sup>5</sup> to meet the 35 per cent reduction from the baseline by 2020, at a total cost of US \$1,019,455, plus agency support costs, to phase out 18.03 ODP tonnes of HCFCs used in the refrigeration and air-conditioning (RAC) servicing sector and manufacturing sector.

### HCFC consumption

4. The Government of Bahrain reported a consumption of 32.76 ODP tonnes of HCFCs in 2020, which is 37 per cent below the HCFC baseline for compliance. The 2016-2020 HCFC consumption is shown in Table 1.

**Table 1. HCFC consumption in Bahrain (2016-2020 Article 7 data)**

HCFC	2016	2017	2018	2019	2020	Baseline
<b>Metric tonnes (mt)</b>						
HCFC-22	824.23	798.85	735.15	669.44	595.55	935.80
HCFC-123	2.54	2.91	0.00	0.00	0.00	0.00
HCFC-141b	3.55	2.00	1.94	2.01	0.00	4.00
<b>Sub-total (mt)</b>	<b>830.32</b>	<b>803.76</b>	<b>737.09</b>	<b>671.45</b>	<b>595.55</b>	<b>939.70</b>
HCFC-141b in imported pre-blended polyols**	172.98	170.46	192.44	125.54	89.82	91.87*
<b>Total (mt)</b>	<b>1,003.30</b>	<b>974.22</b>	<b>929.53</b>	<b>797.00</b>	<b>685.37</b>	
<b>ODP tonnes</b>						
HCFC-22	45.33	43.94	40.43	36.82	32.76	51.50
HCFC-123	0.051	0.058	0.00	0.00	0.00	0.00
HCFC-141b	0.39	0.22	0.21	0.22	0.00	0.40
<b>Sub-total (ODP tonnes)</b>	<b>45.77</b>	<b>44.21</b>	<b>40.65</b>	<b>37.04</b>	<b>32.76</b>	<b>51.90</b>
HCFC-141b in imported pre-blended polyols**	19.03	18.75	21.17	13.81	9.88	10.11*
<b>Total (ODP tonnes)</b>	<b>64.80</b>	<b>62.97</b>	<b>61.82</b>	<b>50.85</b>	<b>42.64</b>	

\*Average consumption between 2007 and 2009.

\*\*Country programme (CP) data.

5. The 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 RAC equipment based on alternative refrigerants, and

<sup>2</sup> As per the letter of 14 July 2021 from the Supreme Council for Environment of Bahrain to UNEP.

<sup>3</sup> UNEP/OzL.Pro/ExCom/68/22 and Annex XIX of UNEP/OzL.Pro/ExCom/68/53

<sup>4</sup> UNEP/OzL.Pro/ExCom/80/12 and Annex V of UNEP/OzL.Pro/ExCom/80/59

<sup>5</sup> UNEP/OzL.Pro/ExCom/84/40 and Annex XXI of UNEP/OzL.Pro/ExCom/84/75

the implementation of phase-out activities related to the refrigeration servicing sector under stage I of the HPMP. The import of HCFC-141b contained in pre-blended polyols increased in 2018 due to building developments as well as the increased manufacturing of refrigeration products; the decrease in 2019 and 2020 was due to economic reasons as well as the impact of COVID-19 pandemic that affected market demand.

#### *CP implementation report*

6. The Government of Bahrain reported HCFC sector consumption data under the 2020 CP implementation report that is 0.31 ODP tonnes less than the amount reported under Article 7 of the Montreal Protocol. This is due to the additional 0.31 ODP tonnes of HCFC-22 imported for stockpiling for consumption in future years.

#### *Verification report*

7. The verification report confirmed that the Government is 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 2019-2020 was correct (as shown in Table 1 above). Independent verification has shown that Bahrain achieved the 35 per cent reduction target by 2020.

#### 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 import, export, trade, transfer, storage and disposal of ozone-depleting substances (ODS) and ODS-based equipment among GCC countries<sup>6</sup> and to replace them with safe alternatives. Law 54/2014 mandates the Supreme Council for Environment of Bahrain to issue the respective by-laws.

9. In stage I of the HPMP, the Government established an operational licensing and quota system; 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 labeling requirements for refilling and 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 service enterprises. The existing legal framework includes a ban on the import, export and transfer of CFC and CFC-containing equipment. 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 applied on HFCs yet.

10. The implementation of the enabling activities for HFC phase-down is at an advanced stage. The Government, in consultation with other GCC countries, is assessing when to ratify the Kigali Amendment taking into account the implications associated with high-ambient-temperature (HAT) conditions.

#### Manufacturing sector

11. At the 68<sup>th</sup> meeting the Executive Committee approved the project to convert one line at Awal Gulf Manufacturing Company (AGM) manufacturing HCFC-22-based split AC to HFC-32 or R-290 refrigerant; the project would result in the phase-out of 14.02 ODP tonnes of HCFC-22. In 2019, the Government of Bahrain and AGM requested to cancel the project. At its 84<sup>th</sup> meeting, the Executive Committee noted the cancellation of the project and that the approved funding, in the amount of US \$1,789,530, has been

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<sup>6</sup> Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

returned to the Fund. The enterprise committed to phasing out the 254.90 mt (14.02 ODP tonnes) of HCFC-22 representing the total consumption associated with the approved conversion using its own funding.

#### Refrigeration servicing sector

12. The results of the implementation of the activities in the refrigeration servicing sector are summarized below:

- (a) Training of 200 customs officers, importers, distributors, traders and government officials in enforcing the licensing and quota system and ODS regulations; monitoring and preventing illegal trade; the use of refrigerant identifiers; and the operation of the e-licensing system under stage I. The budget for purchasing seven refrigerant identifiers was reallocated to training activities, as it was agreed that the Customs Authority would secure identifiers should the need arise;
- (b) Training of 22 trainers and 320 technicians in good servicing practices, the use and handling of flammable and toxic alternative refrigerants; distribution of equipment and tools (e.g., refrigerant identifiers, recovery machines, vacuum pumps, tubing and brazing tools, manifold pressure gauges, refillable cylinders) to one training institution; and the establishment of a procedure for mandatory certification of technicians;
- (c) Establishment of an HCFC reclamation centre and training of technicians; since its establishment, 3,000 kg of refrigerant have been recovered and 1,700 kg reclaimed; and
- (d) Conducted awareness-raising workshops and activities for promoting HCFC phase-out and the adoption of long-term alternatives.<sup>7</sup>

#### Project implementation and monitoring (PMU)

13. The HPMP was implemented by the PMU, at a total cost of US \$141,882, with the following breakdown: staff and consultants US \$70,000; meetings and workshops US \$68,000; and miscellaneous US \$3,882.

#### Financial report

14. As of August 2021, of the US \$994,455 approved, US \$874,543 (88 per cent) had been disbursed (US \$325,787 for UNEP, and US \$548,756 for UNIDO). The third tranche disbursement reached US \$70,000 (38 per cent). A balance of US \$119,912 will be disbursed in 2021-2022.

#### Completion of stage I

15. The fourth and last tranche of stage I was planned for 2020. Due to the delay caused by COVID-19, the implementation of the third tranche was delayed. In submitting stage II, the Government is requesting cancellation of the fourth (final) tranche of stage I (amounting to US \$25,000, plus agency support costs for UNEP). Stage I will be completed by the end of 2021.

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<sup>7</sup> Long-term alternatives refer to long-term options defined in RTOC 2018 assessment report (section 1.6), including ammonia (R-717); carbon dioxide (R-744); hydrocarbons and blends (HCs, e.g. HC-290, HC-600a, HC-1270 etc.); hydrofluorocarbons (unsaturated HFCs (hydrofluoro-olefin) (HFOs) with a four-digit number, lower-GWP HFCs and HFC-HFO blends with 400 and 500 numbers); water (R-718).

## Stage II of the HPMP

### Remaining consumption eligible for funding

16. After deducting 18.03 ODP tonnes of HCFCs associated with stage I of the HPMP, the remaining consumption eligible for funding amounts to 43.36 ODP tonnes of HCFCs, consisting of 25.36 ODP tonnes of HCFC-22 in AC manufacturing, 7.89 ODP tonnes of HCFC-22 in RAC servicing sector, and 10.11 ODP tonnes of HCFC-141b contained in imported pre-blended polyols in the foam sector. Stage II will phase out 40.61 ODP tonnes of HCFCs, consisting of 25.36 ODP tonnes of HCFC-22 in AC manufacturing, 5.13 ODP tonnes of HCFC-22 in RAC servicing and 10.11 ODP tonnes HCFC-141b contained in imported pre-blended polyols, with the remaining 2.75 ODP tonnes of HCFC-22 to be addressed in future stages.

### Sector distribution of HCFCs

17. Bahrain consumes HCFC-22 as a refrigerant for manufacturing domestic ACs (51 per cent of the total consumption in 2020) and for servicing RAC equipment, and HCFC-141b contained in imported pre-blended polyols in manufacturing polyurethane (PU) insulation foam for refrigeration equipment. In previous years, a small amount of HCFC-141b was used as a cleaning agent, and a small amount of HCFC-123 was used for servicing chillers (Table 2).

**Table 2. HCFC consumption sector distribution in Bahrain (ODP tonnes)**

Sectors/sub-sectors	2016	2017	2018	2019	2020
<i>Manufacturing</i>					
HCFC-22 in domestic AC manufacturing	27.23	22.83	21.45	19.25	16.5
HCFC-141b contained in pre-blended polyol in foam sector*	19.03	18.75	21.17	13.81	9.88
Sub-total	46.25	41.58	42.62	33.06	26.38
<i>Servicing Sector</i>					
HCFC-22 used for servicing RAC equipment	12.79	18.48	17.88	17.57	15.95
HCFC-123 used for servicing chillers	0.05	0.06	0.00	0.00	0.00
HCFC-141b used for cleaning refrigeration circuit	0.35	0.22	0.21	0.22	0.00
Sub-total	13.19	18.76	18.09	17.79	15.95
<b>Total</b>	<b>59.44</b>	<b>60.34</b>	<b>60.71</b>	<b>50.85</b>	<b>42.33</b>

\*CP data.

### Manufacturing sector

18. The manufacturing sector consists of the following enterprises:

- (a) One large enterprise, AGM, using HCFC-22 as refrigerant and HCFC-141b contained in pre-blended polyols as a blowing agent for insulation foam in the manufacturing a wide range of AC and commercial refrigeration units. AGM was established in 1994 and is 100 per cent Bahraini-owned; 85 per cent of its production is exported to other Article 5 countries. At the 68<sup>th</sup> meeting, a conversion project to convert one split AC unit manufacturing line to R-290 or HFC-32 was approved; however, in 2019 the enterprise withdrew from the project indicating that the regional conditions and challenges in adopting low-GWP technologies in the high ambient temperature (HAT) region did not allow conversion to the selected HFC-32 technology; the remaining funding balance of US \$1,789,530 associated with the conversion of the split AC manufacturing line in AGM was returned to the Fund;
- (b) One small enterprise manufacturing commercial refrigeration equipment, Awal Refrigeration and Air-Conditioning (ARAC), using HCFC-141b contained in pre-blended polyols for insulation foam; and

- (c) Several small enterprises use HCFC-141b contained in pre-blended polyols for spray foam; only two of these enterprises (Al Khonaizi Insulation System Co. (Al Khonaizi) and Al Manai Trading & Investment (Al Manai)), are eligible for funding, as the remaining enterprises were established after the cut-off date.

19. A summary of HCFC consumption in the manufacturing sector is shown in Table 3.

**Table 3: HCFC use in the manufacturing sector\***

Sector	HCFC-22				HCFC-141b in imported polyol			
	2018	2019	2020	Baseline	2018	2019	2020	Baseline
<b>Mt</b>								
AGM	390.00	350	300	682.5	5.10	8.25	10.14	91.87
ARAC	0.00	0.00	0.00	0.00	1.60	2.00	2.40	
Spray foam	0.00	0.00	0.00	0.00	185.74	115.29	77.28	
Total (mt)	0.00	0.00	0.00	0.00	192.44	125.54	89.82	
<b>ODP tonnes</b>								
AGM	21.45	19.25	16.50	37.54	0.56	0.91	1.12	10.11
ARAC	0.00	0.00	0.00	0.00	0.18	0.22	0.26	
Spray foam	0.00	0.00	0.00	0.00	20.43	12.68	8.50	
Total (ODP t)	21.45	19.25	16.50	37.54	21.17	13.81	9.88	

\*CP data.

#### RAC equipment servicing sector

20. There are approximately 2,900 workshops and 3,500 technicians working to service approximately 1.6 million domestic and commercial AC units consuming 99 per cent of the HCFC-22 consumption in the country in 2020. The remaining one per cent of HCFC-22 was used by approximately 1,600 units of commercial and industrial refrigeration equipment, and transportation reefers.

21. HCFC-22 consumption represents 41 per cent of all refrigerants used for servicing in the country, followed by R-410A (28 per cent), HFC-134a (19 per cent), ammonia (5 per cent), R-407C (4 per cent) and R-404A (3 per cent), and negligible amounts of HCFC-32 and R-290 (0.1 per cent).

#### Phase-out strategy in stage II of the HPMP

22. Stage II of the HPMP plans to achieve 67.5 per cent reduction of the HCFC consumption baseline by 2025. The Government is proposing to phase out 5.13 ODP tonnes of HCFC-22 in the servicing sector and implement a foam umbrella project to eliminate all the use of HCFC-141b contained in imported pre-blended polyols (remaining eligible consumption of 10.11 ODP tonnes; 2020 consumption of 9.88 ODP tonnes) under the HPMP. In addition, the only one enterprise in AC manufacturing, AGM, will phase out its consumption (remaining eligible consumption of 25.36 ODP tonnes; 2020 consumption of 16.50 ODP tonnes) with its own funds.

23. Implementation of stage II will result in the complete phase-out of HCFC-141b contained in imported pre-blended polyols through an investment project in foam manufacturing. The HCFC-22 consumption in manufacturing AC equipment will be voluntarily phased out by the enterprise outside the HPMP. Several activities will also be implemented in the refrigeration servicing sector covering legislation; training of customs officers; training and certification of technicians; technical assistance (TA); awareness-raising activities to promote the adoption of low-global-warming potential (GWP) alternatives; and improvements to refrigerant recovery, recycling and reuse. The lessons learned and infrastructure established during the implementation of stage I of the HPMP will be utilized in stage II.

Proposed activities in stage II of the HPMP*Legal framework*

24. In stage II, the Government will draft and enact by-laws for: mandatory recovery and reclaim of refrigerants; control of refrigerant containers; monitoring leaks of large-sized applications; prohibiting the venting of refrigerants during repair or maintenance of RAC equipment; and registration of importers of HCFCs and HCFC-based equipment. The Government will consider banning the import of new HCFC-based RAC equipment when low-GWP alternatives become available.

*Conversion of foam manufacturing sector*

25. Stage II includes an umbrella project to phase out HCFC-141b contained in imported pre-blended polyols in refrigeration foam and spray foam sectors. Two locally-owned enterprises, are using 9.83 mt of HCFC-141b contained in imported pre-blended polyols for manufacturing insulation foam for commercial refrigeration equipment including coolers, freezers, and cold display cabinets. One enterprise, ARAC, was supported previously by the Multilateral Fund to convert from CFC-11 as a blowing agent and CFC-12 as a refrigerant to HCFC-141b and HFC-134a, respectively. There are also 37 spray foam enterprises using HCFC-141b contained in imported pre-blended polyols in spray foam for building construction; only two of these enterprises were established before the cut-off date. The total consumption of HCFC-141b contained in imported pre-blended polyols is presented in Table 5.

**Table 5. Consumption of HCFC-141b in imported pre-blended polyols eligible for funding**

Enterprise	Sub-sector	HCFC-141b (mt)			Average 2018-2020
		2018	2019	2020	
AGM	PU foam	5.10	8.25	10.14	7.83
ARAC	PU foam	1.60	2.00	2.40	2.00
Al Khonaizi	Spray foam	4.03	1.65	1.42	2.37
Al Manai	Spray foam	0.79	-	-	0.26
<b>Sub-total from eligible enterprises</b>		<b>11.52</b>	<b>11.9</b>	<b>13.96</b>	<b>12.46</b>
Umbrella project for 35 spray foam enterprises not eligible for funding		180.92	113.64	75.86	123.47
<b>Total</b>		<b>192.44</b>	<b>125.54</b>	<b>89.82</b>	<b>135.93</b>

26. HFO is selected as the alternative technology by AGM and ARAC for the conversion of PU rigid insulation foam based on the consideration that it is a well-established low-GWP technology. Water blown technology will be used for the conversion of spray foam manufacturing in two eligible spray foam enterprises. The technology selection for other foam enterprises not eligible for funding are not known; however, low-GWP technologies will be promoted through technical assistance and awareness raising.

27. The incremental costs include the provision of one spray foam forming unit for each Al Khonaizi and Al Manai, technical support by an expert, workshops, training of technicians in the operation of new equipment, and the cost of chemicals and consumables. For the smaller spray foam users not eligible for funding, TA will be provided through training workshops and trials to explore feasible environmentally-friendly alternatives suited to local conditions, and legal measures to expedite the changeover of the sub-sector. The total project cost was calculated at the amount of US \$116,999 to phase out 12.46 mt of HCFC-141b contained in imported pre-blended polyols in four enterprises, as shown in Table 6, with a cost-effectiveness (CE) of US \$9.39/kg. The implementation of the umbrella project will also phase out the consumption at 35 non-eligible enterprises to completely eliminate the use of HCFC-141b contained in imported pre-blended polyols in Bahrain.



**Table 6. Incremental costs of foam umbrella project as submitted (US \$)**

Description of costs	Total cost
Systems house / UNIDO workshop technical support	20,000
Spray foaming units with accessories	22,175
Chemicals and test materials for trials for each conversion project	25,424
Training of technician technical support (AGM, ARAC and spray foam applicators)	40,000
Support for participants, consumables for training workshops at the training center (e.g., printed technical materials, local logistics)	7,000
Communication and miscellaneous for co-ordination, local travel costs	2,400
Total	116,999

28. The project will be implemented between 2021 and 2023. The implementation of the project will phase out all the remaining eligible consumption of HCFC-141b contained in imported pre-blended polyols and 10.11 ODP tonnes (91.87 mt) of HCFC-141b will be deducted from the starting point. The Government will establish a ban on the import of HCFC-141b in imported pre-blended polyols after the completion of the foam project, expected by 1 January 2025.

#### *Domestic AC manufacturing*

29. AGM will voluntarily phase out its consumption of 16.50 ODP tonnes of HCFC-22 in domestic AC manufacturing by 2025. The Government will establish a ban on the import of new HCFC-based equipment and the use of HCFC-22 in RAC equipment manufacturing after the phase-out of consumption in the manufacturing sector.

#### *Refrigeration servicing sector*

30. The following activities are proposed in RAC servicing sector:

(a) *Policy and enforcement capacity-building (legislation):*

- (i) Continuing targeted awareness campaign aimed at Government authorities and relevant stakeholders about the introduction and enforcement of the new GCC regulations; ongoing updating of the national ODS legislation including development of procedures and by-laws; and improvement in the recently developed e-licensing and monitoring system (UNEP) (US \$45,000);
- (ii) Conducting two training sessions for 40 customs officers on Montreal Protocol and HCFC import controls including risk profiling and e-licensing operation; conducting one training workshop for 20 enforcement officers to support enforcement beyond the customs checkpoint and training of 20 customs brokers and importers (UNEP) (US \$24,000);

(b) *Development of standards for products and services:* Continuing development and introduction of national standards and codes that relate to the ODS sector and introduction/promotion of the internationally applicable standards (e.g., labelling, record-keeping and reporting requirements, standards for equipment and installations operating with HC and ammonia); updating the national standards for RAC products in accordance with the international standards; developing Standard Operating Procedures (SOPs) for the servicing workshops for handling flammable and hazardous refrigerants (UNEP) (US \$23,000);

(c) *Training and certification of servicing technicians and support to training institutes:*

- (i) Updating training curriculum to introduce long-term alternatives and safety

- requirements; assisting each Governorate to update the training syllabus; and training 20 teachers in good servicing practices using new curriculum (UNEP) (US \$36,000);
- (ii) Updating National Occupational Competency Standards (NOCS), National Qualification Framework (NQF) and evaluation criteria to include long-term alternatives and safety requirements; and training 20 assessors on competency-based assessment (UNEP) (US \$36,000);
  - (iii) Conducting one workshop for 20 master trainers; training 40 technicians in good servicing practices, refrigerant recovery and recycling, and safe handling of flammable refrigerants; and certification of 100 technicians (UNEP) (US \$49,000);
  - (iv) Providing training tools and equipment (e.g., manifold, pressure gauge, vacuum pumps, leak detectors, recovery unit, tools) to four training schools and four qualification assessment awarding institutes; and servicing tools and equipment (e.g., recovery unit, micron gauge, leak detectors, recovery cylinders, manifold gauge set, weighing scale) to 45 certified technicians (UNIDO) (US \$90,000);
- (d) Improving the national recycling, recovery and reclamation (RRR) programme through provision of laboratory equipment (e.g., gas chromatograph set, sample cylinders) and basic tools and equipment (recovery machines and cylinders) to reclamation centres (UNIDO) (US \$72,000); and
- (e) TA to large end-users to reduce refrigerant leakages and encourage the transition to non-ODS and long-term alternatives through awareness raising, providing information and training; establishing country-wide registration of large RAC system<sup>8</sup> for easy tracking and monitoring leakage; enhancing lifecycle management of refrigerants;<sup>9</sup> continuing the promotion of HCFC phase-out and the use of low-GWP alternatives through information dissemination; and holding two events launching the Recognition of Prior Learning (RPL) programme to promote certification of technicians (UNEP) (US \$73,000).

### *PMU*

31. The PMU is responsible for the implementation of investment projects, training programmes, TA and awareness-raising activities, providing support to the NOU and independent verifier in the verification process; co-ordinating non-governmental stakeholders or some Government department(s), industrial associations, research institutes, standard bureau, training institute, and statistics bureau for the implementation of HPMP activities; assisting the NOU in collecting and analyzing consumption data; and preparing progress reports for various authorities. The cost of the PMU amounts to US \$98,000, (US \$96,000 for staff and consultants and US \$2,000 for other expenses).

### *Gender policy implementation<sup>10</sup>*

32. Stage II of the HPMP has been developed taking into account the Multilateral Fund policy for gender mainstreaming; it will take into consideration gender equality and women's empowerment at all stages of the project cycle to ensure the active participation of women in workshops, stakeholder meetings

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<sup>8</sup> Including AC units with more than 15 tonnes of refrigeration capacity and commercial/industrial refrigeration units.

<sup>9</sup> Including enforcement of RRR, proper disposal of end-of-life equipment and a nation-wide study for other actions.

<sup>10</sup> Decision 84/92(d) requested bilateral and implementing agencies to apply the operational policy on gender mainstreaming throughout the project cycle.

and capacity-building activities. The NOU will aim to seek stakeholders' input on how to integrate gender-specific indicators in the planning, implementation, and reporting process of each component. The training and meeting sessions on ozone issues will further incorporate sessions on gender to further sensitize participants on the importance of gender mainstreaming and women's empowerment.

#### Total cost of stage II of the HPMP

33. The total cost of stage II of the HPMP for Bahrain has been estimated at US \$662,999, plus agency support costs, as originally submitted, for achieving a 67.5 per cent reduction from its HCFC baseline consumption by 2025. The proposed activities and cost breakdown are summarized in Table 7.

**Table 7. Total cost of stage II of the HPMP for Bahrain as submitted**

Activity	Agency	Cost (US \$)	Phase-out (mt)	CE (US \$/kg)
Foam umbrella project to phase out HCFC-141b contained in imported pre-blended polyols	UNIDO	116,999	12.46*	9.39
<i>Activities in the servicing sector</i>				
Development of policy and regulations	UNEP	45,000	93.33	4.80
Development of standards for products and services	UNEP	23,000		
Training of custom officers, enforcement personnel and customs brokers	UNEP	24,000		
Training of and certification of technicians in RAC servicing	UNEP	211,000		
Improvement of the national RRR programme	UNIDO	72,000		
Awareness-raising and outreach activities to promote HCFC phase-out and adoption of low-GWP alternatives technologies	UNEP	73,000		
<i>Sub-total servicing sector</i>		448,000		
Project management unit		98,000		
<b>Total</b>		<b>662,999</b>	<b>105.79</b>	<b>6.27</b>
Voluntary reduction of HCFC-22 in AC manufacturing at AGM		0	300.00	0

\*The umbrella project will not only phase out the 12.46 mt of eligible consumption in four enterprises but also phase out all the remaining non-eligible consumption and eliminate the use of HCFC-141b contained in imported pre-blended polyols in the foam sector in Bahrain.

#### Activities planned for the first tranche of stage II

34. The first tranche of stage II of the HPMP at the total amount of US \$448,000 will be implemented between November 2021 and November 2023 and will include the following activities:

- (a) Umbrella project to phase out HCFC-141b contained in imported pre-blended polyols in commercial refrigeration foam and spray foam sector (UNIDO) (US \$116,999);
- (b) *Policy and enforcement capacity-building (legislation):*
  - (i) Continuing targeted awareness campaign aimed at Government authorities and relevant stakeholders about the introduction and enforcement of the new GCC regulations; on-going updating of the national ODS legislation including development of procedures and by-laws; and improvement in the recently developed e-licensing and monitoring system (UNEP) (US \$19,000);
  - (ii) Training of 20 customs officers on Montreal Protocol and HCFCs import controls including risk profiling and e-licensing operation; conducting one training workshop for 20 enforcement officers to support enforcement beyond the customs checkpoint and training of 20 customs brokers and importers (UNEP) (US \$18,000);

- (c) *Development of standards for products and services:* Continuing development and introduction of national standards and codes that relate to the ODS sector and introduction/promotion of the internationally applicable standards (e.g., labelling, record-keeping and reporting requirements, standards for equipment and installations operating with HC and ammonia); updating the national standards for RAC products in accordance with the international standards; developing SOPs for the servicing workshops for handling flammable and hazardous refrigerants (UNEP) (US \$23,000);
- (d) *Training and certification of servicing technicians:*
  - (i) Updating training curriculum to introduce long-term alternatives and safety requirements; assisting each Governorate to update the training syllabus; and training 20 teachers in good servicing practices using new curriculum (UNEP) (US \$36,000);
  - (ii) Updating NOCS, NQF and evaluation criteria to include long-term alternatives and safety requirements; and training 20 assessors on competency-based assessment (UNEP) (US \$26,000);
  - (iii) Conducting one workshop for 20 master trainers; training 20 technicians in good servicing practices, refrigerant recovery and recycling, and safe handling of flammable refrigerants; certification of 50 technicians (UNEP) (US \$27,000);
  - (iv) Providing training tools and equipment (e.g., manifold, pressure gauge, vacuum pumps, leak detectors, recovery unit, tools) to four training schools and four qualification assessment awarding institutes (UNIDO, US \$24,000); and providing tools and equipment (e.g., recovery unit, micron gauge, leak detectors, recovery cylinders, manifold gauge set, weighing scale) to 45 certified technicians (UNIDO) (US \$45,000);
- (e) Improving the national recycling, recovery and reclamation (RRR) programme through provision of laboratory equipment (e.g., gas chromatograph set, sample cylinders) and basic tools and equipment (recovery machines and cylinders) to reclamation centres (UNIDO) (US \$42,000);
- (f) TA to large end-users to reduce refrigerant leakages and encourage the transition to non-ODS and long-term alternatives through awareness raising, providing information and training; establishing country-wide registration of large RAC system<sup>11</sup> for easy tracking and monitoring leakage; enhancing lifecycle management of refrigerants;<sup>12</sup> continuing promotion of HCFC phase-out, use of low-GWP alternatives through information dissemination; and holding two events launching the RPL programme to promote certification of technicians (UNEP) (US \$51,500); and
- (g) Project co-ordination, implementation, monitoring and reporting at a cost of US \$49,000, (US \$48,000 for staff and consultants), and (US \$1,000 for other expenses).

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<sup>11</sup> Including AC units with more than 15 tonnes of refrigeration capacity and commercial/industrial refrigeration units.

<sup>12</sup> Including enforcement of RRR, proper disposal of end of life equipment and a nation-wide study for other actions.

## SECRETARIAT’S COMMENTS AND RECOMMENDATION

### COMMENTS

35. The Secretariat reviewed stage II of the HPMP in light of stage I, the policies and guidelines of the Multilateral Fund, including the criteria for funding HCFC phase-out in the consumption sector for stage II of HPMPs (decision 74/50), and the 2021-2023 business plan of the Multilateral Fund.

#### HCFC consumption and compliance

36. The Secretariat noted that although the consumption has been decreasing due to phase-out in the manufacturing sector, the consumption in the servicing sector has been stable from 2010 to 2020. UNEP explained that HCFC-22 is mainly consumed for servicing domestic ACs; the consumption remained steady was due to the fact that low-GWP alternative technologies in the domestic AC sector for HAT countries were not available. The performance of R-410A-based AC is lower than HCFC-22-based ACs; and the adoption of R-290 technology is still under discussion. The consumption will decrease gradually starting from 2024 and reach zero in 2030 with a servicing tail to 2040.

#### Overarching strategy

37. Stage II will phase out all the HCFCs in the manufacturing sector by 2025. Upon a request for further clarification on the conversion of AGM, UNEP explained that AGM is committed to phasing out all HCFC-22 with its own funding; the alternative technology will possibly be HFCs taking into account market demand and the options acceptable for HAT countries. The progress in the conversion of the manufacturing lines in AGM will be monitored and reported to the Executive Committee as it progresses in the tranche implementation reports. To ensure sustainability of the phase-out in the manufacturing sector, the Government plans to establish a ban on the import of HCFC-141b contained in pre-blended polyols once the conversion projects in the foam sector are completed, expected by 1 January 2025.

#### Remaining eligible consumption

38. The Secretariat and UNEP discussed the HCFC-22 phase-out in the servicing and manufacturing sectors in stage I, and the remaining eligible consumption for funding in stage II and for future stages. Since Bahrain did not request funding for phase-out of HCFC-22 used in the manufacturing sector in stage II, the eligible funding is for the phase-out of HCFC-22 consumption in the servicing sector only. Therefore, the starting point, phase-out in stages I and II, and the remaining eligible consumption in servicing sector of HCFC-22 were calculated separately from the manufacturing sector. In stage II, Bahrain will phase out 5.13 ODP tonnes consumption in the servicing sector under the HPMP and plans to address all the remaining consumption of HCFC-22 in manufacturing sector voluntarily, with the remaining eligible consumption of 2.75 ODP tonnes to be addressed in future stages. In addition, 10.11 ODP tonnes of HCFC-141b contained in imported pre-blended polyols will be phased-out through only an umbrella project. An overview of the starting point, reduction in stage I and stage II, and remaining eligible consumption is shown in Table 8.

**Table 8. Starting point, reduction in stage I and stage II, and remaining eligible consumption**

Substance	Starting point		Stage I reduction		Remaining after stage I		Stage II reduction		Remaining after stage II	
	mt	ODP t	Mt	ODP t	mt	ODP t	mt	ODP t	mt	ODP t
HCFC-22 in manufacturing	682.50	37.54	221.27	12.17	461.23	25.37	461.23	25.37	0	0
HCFC-22 in servicing	242.00	13.31	98.61	5.42	143.39	7.89	93.33	5.13	50.06	2.75
<b>Sub-total HCFC-22</b>	<b>924.50</b>	<b>50.85</b>	<b>319.88</b>	<b>17.59</b>	<b>604.62</b>	<b>33.25</b>	<b>554.56</b>	<b>30.50</b>	<b>50.06</b>	<b>2.75</b>

Substance	Starting point		Stage I reduction		Remaining after stage I		Stage II reduction		Remaining after stage II	
	mt	ODP t	Mt	ODP t	mt	ODP t	mt	ODP t	mt	ODP t
HCFC-141b pure in servicing	3.97	0.44	3.97	0.44	0	0	0	0	0	0
Total HCFCs in pure	928.47	51.28	323.85	18.03	604.62	33.25	554.56	30.50	50.06	2.75
HCFC-141b in pre blended polyols	91.87	10.11	0	0	91.87	10.11	91.87	10.11	0.00	0.00
<b>Grand total</b>	1,020.34	61.39	323.85	18.03	696.49	43.36	658.89	40.61	50.06	2.75

#### Technical and cost-related issues

39. With regard to the cancellation of the fourth tranche of stage I, the Government agrees that the funding of the fourth tranche (US \$25,000) will be forfeited. The Secretariat noted that Bahrain has achieved the 2020 target in compliance with the Montreal Protocol phase-out schedule.

40. The Secretariat discussed the phase-out amount in the servicing sector in stage II and the remaining eligible consumption in stage III, and noted that the phase-out in stage II is more than the amount required to achieve compliance with the 67.5 per cent reduction. The Secretariat noted that the HCFC-22 consumption eligible for funding for Bahrain was in the servicing sector only due to the voluntary reduction in the manufacturing sector. Bahrain has addressed 40 per cent of the servicing sector consumption in stage I and will address additional 39 per cent in stage II, leaving 21 per cent (50.06 mt) to be addressed in a future stage. The Secretariat discussed whether less funding could be requested to address less tonnages in stage II; UNEP emphasized that a large amount of the phase-out is through voluntary reduction by the manufacturing sector; a certain amount of consumption needs to be addressed in the servicing sector as funding is needed in stage II to co-ordinate the phase-out in the manufacturing sector and to develop several legal measures (certification of technicians and strengthening of refrigerant recycling) to support the country in achieving the compliance target in 2025. It is expected that the legal measures established and the momentum built in stage I and II will support the country to continuously phase out the remaining HCFCs in future stages.

41. Although the Government has committed to the phase-out of the consumption of HCFC-22 used in the manufacturing sector, no detailed conversion plan was provided as no funding was requested from the Multilateral Fund. Due to the uncertainty of the phase-out of this consumption with respect to the timeline and to ensure that the country would be able to be in compliance with its commitments under the HPMP, it was agreed to set the maximum allowable consumption target in row 1.2 of Appendix 2-A of the Agreement for 2025 13.75 ODP tonnes, i.e., 18 per cent below the limit in the Montreal Protocol phase-out schedule and a reduction of 73.5 per cent from the country's baseline for compliance.

42. The incremental costs requested for the foam umbrella project were largely in line with the guidelines of the Executive Committee, therefore the requested amount was agreed upon. Minor adjustments were made among the cost items to rationalize the incremental costs for the umbrella project (the foaming unit for Al Manai was removed, instead, retrofitting cost was provided; support for dissemination of information and experience to other enterprises in the foam sector was provided) to ensure a sector phase-out. The final agreed cost schedule is shown in Table 9.

**Table 9. Agreed cost for foam umbrella project in Bahrain (US \$)**

Description	Unit price	No. of units	Total cost
Spray foaming machine for Al Khonaizi Insulation System Co. (including drum pump, whip hose and 20-meter heated hose, and spare mixing head)	15,000	1	15,000
Retrofit of spray foaming unit (one mixing head) for Al Manai Trading & Investment	3,500	1	3,500
Development of foam formulations with technical support from the systems houses operating in the region	6,750	4	27,000
Training of technician, technical support (AGM and ARAC)	12,500	2	25,000
TA and a two-day training workshop for spray foam enterprises	26,500	1	26,500
Chemicals and test materials (mt) for test and trials, total 4 mt: 1.5 kg for each AGM and ARAC; 1 mt for two spray foam applicators (each 500 kg) for spray foam enterprises	3,500	4	14,000
One workshop for the dissemination of experience gained in the foam sector	5,999	1	5,999
<b>Total cost</b>			<b>116,999</b>
Total phase-out by four eligible enterprises (mt)			12.46
CE calculated based on consumption in eligible enterprises (US \$/kg)			9.39
Total sector phase-out (mt)			89.82*
CE calculated based on total remaining consumption in the foam sector (US \$/kg)			1.30

\*Total use of HCFC-141b contained in imported pre-blended polyols in the foam sector in 2020. This amount is less than the remaining consumption eligible for funding of 91.87 mt. After completion of the umbrella project, 91.87 mt will be deducted from the starting point.

#### Total project cost

43. The total cost for stage II of the HPMP amounts to US \$662,999, agreed as submitted, to achieve 67.5 per cent reduction in HCFC consumption baseline. The funding distribution for stage II of the HPMP has been adjusted to reduce the funding in the first tranche, taking into consideration the impact of COVID-19 pandemic, and a third tranche was added to 2025 in line with decision 62/17.<sup>13</sup>

#### Impact on the climate

44. The phase-out of HCFC-141b contained in imported pre-blended polyols in four eligible enterprises will reduce emission of green-house gasses by 9,200 CO<sub>2</sub>-eq tonnes, as shown in Table 10. The alternatives to be adopted by non-eligible enterprises in the foam sector are unknown; it is expected that the awareness raising activities, training and information dissemination conducted under the HPMP will promote the use of low-GWP technologies and result in further climate benefit from the sector phase-out.

**Table 10. Climate impact for the conversion of four foam enterprises**

Description	Substance	Consumption (mt)	GWP	Emission (CO <sub>2</sub> -eq tonnes)
Before conversion	HCFC-141b (mt)	12.46	725.00	9,034
After conversion	HFO or CO <sub>2</sub>	6.64	2.00	13
Net climate impact				9,020

45. The proposed activities in the servicing sector, which include better containment of refrigerants through training and the provision of equipment, will reduce the amount of HCFC-22 used for RAC servicing. Each kilogramme of HCFC-22 not emitted due to better refrigeration practices results in savings of approximately 1.8 CO<sub>2</sub>-equivalent tonnes. Although a calculation of the impact on the climate was not included in the HPMP, the activities planned by Bahrain, including its efforts in training technicians in

<sup>13</sup> To request the bilateral and implementing agencies, when preparing multi-year HCFC phase-out management plans, to ensure that the last tranche comprised 10 per cent of the total funding for the refrigeration servicing sector in the agreement and was scheduled for the last year of the plan.

refrigerant containment, RRR, as well as the promotion of low-GWP alternatives, indicate that the implementation of the HPMP will reduce the emission of refrigerants into the atmosphere, resulting in climate benefits.

### **Co-financing**

46. The phase-out of 300 mt of HCFC-22 in the AC manufacturing sector will be funded by the enterprise AGM. The Government of Bahrain has committed to providing in-kind contribution for the implementation of some activities under the policy and regulatory component of the HPMP.

### **2021-2023 draft business plan of the Multilateral Fund**

47. UNEP and UNIDO are requesting US \$662,999, plus agency support costs, for the implementation of stage II of the HPMP for Bahrain. The total requested value of US \$647,829, including agency support costs for the period of 2021–2023, is US \$925,227 below the amount in the business plan.

### **Revision of the Agreement for stage I of the HPMP**

48. The Agreement between the Government of Bahrain and the Executive Committee for stage I of the HPMP will be further updated to reflect the cancellation of the fourth tranche, specifically Appendix 2-A and paragraph 16 to show that the revised updated Agreement will supersede that reached at the 84<sup>th</sup> meeting as shown in Annex I to the present document. The full revised updated Agreement will be appended to the final report of the 88<sup>th</sup> meeting.

### **Draft Agreement for stage II of the HPMP**

49. A draft Agreement between the Government of Bahrain and the Executive Committee for the phase-out of HCFCs in stage II of the HPMP is contained in Annex II to the present document.

## **RECOMMENDATION**

50. The Executive Committee may wish to consider:

#### Stage I of the HCFC phase-out management plan for Bahrain

- (a) Noting:
  - (i) The progress report on the implementation of the third tranche of stage I of the HCFC phase-out management plan (HPMP) for Bahrain;
  - (ii) The request of the Government of Bahrain for cancellation of the fourth tranche of stage I of the HPMP;
  - (iii) That the Fund Secretariat has updated the revised updated Agreement between the Government of Bahrain and the Executive Committee, as contained in Annex I to the present document, specifically Appendix 2-A based on the revised funding level due to cancellation of the fourth and final tranche, and paragraph 16 was updated to indicate that the updated revised Agreement superseded that reached at the 84<sup>th</sup> meeting;
- (b) Requesting the Government of Bahrain, UNEP and UNIDO to submit a progress report on the implementation of the work programme associated with the third tranche and the project completion report to the 90<sup>th</sup> meeting; and to return the remaining funding balance from stage I of the HPMP to the 91<sup>st</sup> meeting;



Stage II of the HCFC phase-out management plan for Bahrain

- (c) Approving, in principle, stage II of the HPMP for Bahrain for the period from 2021 to 2025 to reduce HCFC consumption by 73.5 per cent of the country's baseline in the amount of US \$732,449, consisting of US \$384,000, plus agency support costs of US \$49,920 for UNEP, and US \$278,999, plus agency support costs of US \$19,530 for UNIDO;
- (d) Noting the commitment of the Government of Bahrain:
  - (i) To reduce HCFC consumption by 73.5 per cent of the country's baseline by 2025;
  - (ii) To ban the import and use of HCFC-141b contained in pre-blended polyols, and the import and manufacturing of HCFC-22-based air-conditioning equipment, by 1 January 2025;
- (e) Deducting 40.61 ODP tonnes of HCFCs from the remaining HCFC consumption eligible for funding;
- (f) Approving the draft Agreement between the Government of Bahrain and the Executive Committee for the reduction in consumption of HCFCs, in accordance with stage II of the HPMP, contained in Annex II to the present document; and
- (g) Approving the first tranche of stage II of the HPMP for Bahrain, and the corresponding tranche implementation plans, in the amount of US \$500,214, consisting of US \$249,500, plus agency support costs of US \$32,435 for UNEP, and US \$203,999, plus agency support costs of US \$14,280 for UNIDO.



**Annex I**

**TEXT TO BE INCLUDED IN THE REVISED UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF THE KINGDOM OF BAHRAIN AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS**

(Relevant changes are in bold font for ease of reference)

16. This revised updated Agreement supersedes the Agreement reached between the Government of Bahrain and the Executive Committee at the **84<sup>th</sup>** meeting of the Executive Committee.

**APPENDIX 2-A: THE TARGETS, AND FUNDING**

Row	Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	n/a	51.90	51.90	46.71	46.71	46.71	46.71	46.71	33.74	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	n/a	51.77	51.77	46.58	46.45	45.39	43.54	37.27	33.74	n/a
2.1	Lead IA (UNEP) agreed funding (US \$)	120,000	0	145,000	0		0		180,000	<b>0</b>	<b>445,000</b>
2.2	Support costs for Lead IA (US \$)	15,600	0	18,850	0		0		23,400	<b>0</b>	<b>57,850</b>
2.3	Cooperating IA (UNIDO) agreed funding (US \$)	549,455	0	0	0	0	0	0	0	0	549,455
2.4	Support costs for Cooperating IA (US \$)	38,462	0	0	0	0	0	0	0	0	38,462
3.1	Total agreed funding (US \$)	669,455	0	145,000	0		0		180,000	<b>0</b>	<b>994,455</b>
3.2	Total support costs (US \$)	54,062	0	18,850	0		0		23,400	<b>0</b>	<b>96,312</b>
3.3	Total agreed costs (US \$)	723,517	0	163,850	0		0		203,400	<b>0</b>	<b>1,090,767</b>
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)										17.59
4.1.2	Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes)										0
4.1.3	Remaining eligible consumption for HCFC-22(ODP tonnes)										33.25
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)										0.44
4.2.2	Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes)										0.0
4.2.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)										0.0
4.3.1	Total phase-out of HCFC-141b contained in imported pre-blended polyols agreed to be achieved under this Agreement (ODP tonnes)										0.0
4.3.2	Phase-out of HCFC-141b contained in imported pre-blended polyols to be achieved in previously approved projects (ODP tonnes)										0
4.3.3	Remaining eligible consumption for HCFC-141b contained in imported pre-blended polyols (ODP tonnes)										10.11



## Annex II

### **DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF KINGDOM OF BAHRAIN AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN**

#### **Purpose**

1. This Agreement represents the understanding of the Government of Bahrain (the “Country”) and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A (“The Substances”) to a sustained level of 13.75 ODP tonnes by 1 January 2025 in compliance with Montreal Protocol schedule.
2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A (“The Targets, and Funding”) in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3, 4.2.3 and 4.3.3 (remaining consumption eligible for funding).
3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A (“Funding Approval Schedule”).
4. The Country agrees to implement this Agreement in accordance with the stage II of the HCFC phase-out management plan (HPMP) approved (“the Plan”). In accordance with sub-paragraph 5(b) of this Agreement, the Country will accept independent verification of the achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement. The aforementioned verification will be commissioned by the relevant bilateral or implementing agency.

#### **Conditions for funding release**

5. The Executive Committee will only provide the Funding in accordance with the Funding Approval Schedule when the Country satisfies the following conditions at least eight weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:
  - (a) That the Country has met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved. Years for which there are no due country programme implementation reports at the date of the Executive Committee meeting at which the funding request is being presented are exempted;
  - (b) That the meeting of these Targets has been independently verified for all relevant years, unless the Executive Committee decided that such verification would not be required;
  - (c) That the Country had submitted a Tranche Implementation Report in the form of Appendix 4-A (“Format of Tranche Implementation Reports and Plans”) covering each previous calendar year; that it had achieved a significant level of implementation of

activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and

- (d) That the Country has submitted a Tranche Implementation Plan in the form of Appendix 4-A covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

### **Monitoring**

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A (“Monitoring Institutions and Roles”) will monitor and report on implementation of the activities in the previous Tranche Implementation Plans in accordance with their roles and responsibilities set out in the same appendix.

### **Flexibility in the reallocation of funds**

7. The Executive Committee agrees that the Country may have the flexibility to reallocate part or all of the approved funds, according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

- (a) Reallocations categorized as major changes must be documented in advance either in a Tranche Implementation Plan as foreseen in sub-paragraph 5(d) above, or as a revision to an existing Tranche Implementation Plan to be submitted eight weeks prior to any meeting of the Executive Committee, for its approval. Major changes would relate to:
  - (i) Issues potentially concerning the rules and policies of the Multilateral Fund;
  - (ii) Changes which would modify any clause of this Agreement;
  - (iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches;
  - (iv) Provision of funding for activities not included in the current endorsed Tranche Implementation Plan, or removal of an activity in the Tranche Implementation Plan, with a cost greater than 30 per cent of the total cost of the last approved tranche; and
  - (v) Changes in alternative technologies, on the understanding that any submission for such a request would identify the associated incremental costs, the potential impact to the climate, and any differences in ODP tonnes to be phased out if applicable, as well as confirm that the Country agrees that potential savings related to the change of technology would decrease the overall funding level under this Agreement accordingly;
- (b) Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the subsequent Tranche Implementation Report;
- (c) Any enterprise to be converted to non-HCFC technology included in the Plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e., due to foreign ownership or establishment post the 21 September 2007 cut-off date), would not receive financial assistance. This information would be reported as part of the Tranche

Implementation Plan;

- (d) The Country commits to examining the possibility of using pre-blended systems with low-global warming potential blowing agents instead of blending them in-house, for those foam enterprises covered under the Plan, should this be technically viable, economically feasible and acceptable to the enterprises;
- (e) The Country agrees, in cases where HFC technologies have been chosen as an alternative to HCFCs, and taking into account national circumstances related to health and safety: to monitor the availability of substitutes and alternatives that further minimize impacts on the climate; to consider, in the review of regulations standards and incentives adequate provisions that encourage introduction of such alternatives; and to consider the potential for adoption of cost-effective alternatives that minimize the climate impact in the implementation of the HPMP, as appropriate, and inform the Executive Committee on the progress accordingly in tranche implementation reports; and
- (f) Any remaining funds held by the bilateral or implementing agencies or the Country under the Plan will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

**Considerations for the refrigeration servicing sector**

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sector included in the Plan, in particular:

- (a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and
- (b) The Country and relevant bilateral and/or implementing agencies would take into consideration relevant decisions on the refrigeration servicing sector during the implementation of the Plan.

**Bilateral and implementing agencies**

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNEP has agreed to be the lead implementing agency (the “Lead IA”) and UNIDO has agreed to be the cooperating implementing agency (the “Cooperating IA”) under the lead of the Lead IA in respect of the Country’s activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of the Lead IA and/or Cooperating IA taking part in this Agreement.

10. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification as per sub-paragraph 5(b). The Cooperating IA will support the Lead IA by implementing the Plan under the overall co-ordination of the Lead IA. The roles of the Lead IA and Cooperating IA are contained in Appendix 6-A and Appendix 6-B, respectively. The Executive Committee agrees, in principle, to provide the Lead IA and the Cooperating IA with the fees set out in rows 2.2 and 2.4 of Appendix 2-A.

**Non-compliance with the Agreement**

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees

that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A (“Reductions in Funding for Failure to Comply”) in respect of each ODP kg of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once decisions are taken, the specific case of non-compliance with this Agreement will not be an impediment for the provision of funding for future tranches as per paragraph 5 above.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decisions that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee, the Lead IA and the Cooperating IA to facilitate implementation of this Agreement. In particular, it will provide the Lead IA and the Cooperating IA with access to the information necessary to verify compliance with this Agreement.

#### **Date of completion**

14. The completion of the Plan and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified in Appendix 2-A. Should at that time there still be activities that are outstanding, and which were foreseen in the last Tranche Implementation Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion of the Plan will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), 1(b), 1(d), and 1(e) of Appendix 4-A will continue until the time of the completion of the Plan unless otherwise specified by the Executive Committee.

#### **Validity**

15. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

16. This Agreement may be modified or terminated only by mutual written agreement of the Country and the Executive Committee of the Multilateral Fund.

### **APPENDICES**

#### **APPENDIX 1-A: THE SUBSTANCES**

<b>Substance</b>	<b>Annex</b>	<b>Group</b>	<b>Starting point for aggregate reductions in consumption (ODP tonnes)</b>
HCFC-22	C	I	50.85
HCFC-141b	C	I	0.44
Sub-total			51.28
HCFC-141b contained in imported pre-blended polyols	C	I	10.11
Total	C	I	61.39



## APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2021	2022	2023	2024	2025	Total	
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	33.74	33.74	33.74	33.74	16.87	n/a	
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	33.74	33.74	33.74	33.74	13.75	n/a	
2.1	Lead IA (UNEP) agreed funding (US \$)	249,500		79,500		55,000	384,000	
2.2	Support costs for Lead IA (US \$)	32,435		10,335		7,150	49,920	
2.3	Cooperating IA (UNIDO) agreed funding (US \$)	203,999		54,000		21,000	278,999	
2.4	Support costs for Cooperating IA (US \$)	14,280		3,780		1,470	19,530	
3.1	Total agreed funding (US \$)	453,499		133,500		76,000	662,999	
3.2	Total support costs (US \$)	46,715		14,115		8,620	69,450	
3.3	Total agreed costs (US \$)	500,214		147,615		84,620	732,449	
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)							30.50
4.1.2	Phase-out of HCFC-22 to be achieved in the previous stage (ODP tonnes)							17.59
4.1.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)							2.75
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)							0
4.2.2	Phase-out of HCFC-141b to be achieved in the previous stage (ODP tonnes)							0.44
4.2.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)							0
4.3.1	Total phase-out of HCFC-141b contained in imported pre-blended polyols agreed to be achieved under this Agreement (ODP tonnes)							10.11
4.3.2	Phase-out of HCFC-141b contained in imported pre-blended polyols to be achieved in the previous stage (ODP tonnes)							0
4.3.3	Remaining eligible consumption for HCFC-141b contained in imported pre-blended polyols (ODP tonnes)							0

\*Date of completion of stage I as per stage I Agreement: 31 December 2021.

## APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the first meeting of the year specified in Appendix 2-A.

## APPENDIX 4-A: FORMAT OF TRANCHE IMPLEMENTATION REPORTS AND PLANS

1. The submission of the Tranche Implementation Report and Plans for each tranche request will consist of five parts:

- (a) A narrative report, with data provided by tranche, describing the progress achieved since the previous report, reflecting the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it, and how they relate to each other. The report should include the amount of ODS phased out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives, to allow the Secretariat to provide to the Executive Committee information about the resulting change in climate relevant emissions. The report should further highlight successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted Tranche Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes;

- (b) An independent verification report of the Plan results and the consumption of the Substances, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;
  - (c) A written description of the activities to be undertaken during the period covered by the requested tranche, highlighting implementation milestones, the time of completion and the interdependence of the activities, and taking into account experiences made and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall Plan and progress achieved, as well as any possible changes to the overall Plan that are foreseen. The description should also specify and explain in detail such changes to the overall plan. This description of future activities can be submitted as a part of the same document as the narrative report under sub-paragraph (b) above;
  - (d) A set of quantitative information for all Tranche Implementation Reports and Plans, submitted through an online database; and
  - (e) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(d).
2. In the event that in a particular year two stages of the HPMP are being implemented in parallel, the following considerations should be taken in preparing the Tranche Implementation Reports and Plans:
- (a) The Tranche Implementation Reports and Plans referred to as part of this Agreement, will exclusively refer to activities and funds covered by this Agreement; and
  - (b) If the stages under implementation have different HCFC consumption targets under Appendix 2-A of each Agreement in a particular year, the lower HCFC consumption target will be used as reference for compliance with these Agreements and will be the basis for the independent verification.

#### **APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES**

1. The national ozone unit (NOU) is the central administrative unit established within the Ministry of Environment and is responsible for co-ordination of governmental agencies with respect to the ozone layer protection and facilitation of ODS phase-out, and the implementation of activities under the Plan.
2. The NOU will manage the implementation of the activities under the Plan in cooperation with the Lead IA. An independent and certified auditor will audit and verify the consumption of HCFCs reported by the Government under Article 7 of the Montreal Protocol and the country programme reporting.
3. The Project Management Unit will monitor the implementation of the activities. The detailed responsibilities include the following:
  - (a) Day-to-day implementation of investment projects (where applicable), training programmes, technical assistance and awareness-raising activities included in the approved Plan;

- (b) Providing support to the NOU and independent verifier during verification process (e.g., meetings with relevant stakeholders, data collection co-ordination, and inputs on review findings);
- (c) Under the guidance of the NOU, co-ordinating non-governmental stakeholders or some Government department(s), industrial associations, research institutes, standard bureau, training institutes, and statistics bureau for the implementation of activities under the Plan; and
- (d) Assisting the NOU in data gathering, analysis and reporting, including collecting and analyzing consumption data pertaining to the controlled substances associated with the Plan implementation.

#### **APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY**

1. The Lead IA will be responsible for a range of activities, including at least the following:
  - (a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;
  - (b) Assisting the Country in preparation of the Tranche Implementation Reports and Plans as per Appendix 4-A;
  - (c) Providing independent verification to the Executive Committee that the Targets have been met and associated tranche activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;
  - (d) Ensuring that the experiences and progress is reflected in updates of the overall plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;
  - (e) Fulfilling the reporting requirements for the Tranche Implementation Reports and Plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee, and should include the activities implemented by the Cooperating IA;
  - (f) In the event that the last funding tranche is requested one or more years prior to the last year for which a consumption target had been established, annual tranche implementation reports and, where applicable, verification reports on the current stage of the Plan should be submitted until all activities foreseen had been completed and HCFC consumption targets had been met;
  - (g) Ensuring that appropriate independent technical experts carry out the technical reviews;
  - (h) Carrying out required supervision missions;
  - (i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;
  - (j) Co-ordinating the activities of the Cooperating IA, and ensuring appropriate sequence of activities;
  - (k) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country and the Cooperating IA, the

allocation of the reductions to the different budget items and to the funding of the Lead IA and each Cooperating IA;

- (l) Ensuring that disbursements made to the Country are based on the use of the indicators;
- (m) Providing assistance with policy, management and technical support when required;
- (n) Reaching consensus with the Cooperating IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan; and
- (o) Timely releasing funds to the Country/participating enterprises for completing the activities related to the project.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

#### **APPENDIX 6-B: ROLE OF THE COOPERATING IMPLEMENTING AGENCIES**

1. The Cooperating IA will be responsible for a range of activities. These activities are specified in the Plan, including at least the following:

- (a) Providing assistance for policy development when required;
- (b) Assisting the Country in the implementation and assessment of the activities funded by the Cooperating IA, and refer to the Lead IA to ensure a co-ordinated sequence in the activities;
- (c) Providing reports to the Lead IA on these activities, for inclusion in the consolidated reports as per Appendix 4-A; and
- (d) Reaching consensus with the Lead IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan.

#### **APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY**

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US \$32.27 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met, on the understanding that the maximum funding reduction would not exceed the funding level of the tranche being requested. Additional measures might be considered in cases where non-compliance extends for two consecutive years.

2. In the event that the penalty needs to be applied for a year in which there are two Agreements in force (two stages of the HPMP being implemented in parallel) with different penalty levels, the application of the penalty will be determined on a case-by-case basis taking into consideration the specific sectors that lead to the non-compliance. If it is not possible to determine a sector, or both stages are addressing the same sector, the penalty level to be applied would be the largest.