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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninetieth Meeting
Montreal, 20-23 June 2022
Items 9(a) and (d) of the provisional agenda¹

PROJECT PROPOSAL: PAKISTAN

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, fourth tranche) UNIDO
- HCFC phase-out management plan (stage III, first tranche) UNIDO and UNEP

¹ UNEP/OzL.Pro/ExCom/90/1

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

PAKISTAN

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out management plan (stage II)	UNEP, UNIDO (lead)	76 th	50 % by 2020

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	122.21 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2021	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCFC-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCFC-141b	0.00	8.03	0.00	0.00	0.00	0.00	0.00	0.00	8.03
HCFC-142b	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCFC-22	0.00	1.69	0.00	2.70	108.14	0.00	0.00	0.00	112.53

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	248.11	Starting point for sustained aggregate reductions:	248.11
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	156.76	Remaining:	89.68

(V) BUSINESS PLAN		2022	2023	2024	Total
UNIDO	ODS phase-out (ODP tonnes)	5.9	0.00	0.00	5.9
	Funding (US \$)	478,000	0	0	478,000
UNEP	ODS phase-out (ODP tonnes)	0.00	0.00	0.00	0.00
	Funding (US \$)	0	0	0	0

(VI) PROJECT DATA			2016	2017	2018*	2019	2020	2021	2022	2023	Total
Montreal Protocol consumption limits			223.30	223.30	223.30	223.30	161.27	161.27	161.27	161.27	n/a
Maximum allowable consumption (ODP tonnes)			223.30	223.30	223.30	223.30	124.06	124.06	124.06	124.06	n/a
Agreed funding (US \$)	UNEP	Project costs	200,000	0	200,000	0	0	103,000	0	0	503,000
		Support costs	25,976	0	25,976	0	0	13,378	0	0	65,330
	UNIDO	Project costs	2,350,200	0	1,979,852	619,938	0	0	161,340***	0	5,111,330
		Support costs	164,514	0	138,590	43,396	0	0	11,293***	0	357,793
Funds approved by ExCom (US \$)	Project costs	2,550,200	0	0	2,799,790*	0	103,000**	0	0	5,452,990	
	Support costs	190,490	0	0	207,962	0	13,378**	0	0	411,830	
Project funds requested for approval at this meeting (US \$)	Project costs	0	0	0	0	0	0	161,340***	0	161,340	
	Support costs	0	0	0	0	0	0	11,293***	0	11,293	

*The second tranche was approved at the 83rd meeting, and funding for an extruded polystyrene foam investment project was approved at the 84th meeting.

** The third tranche was submitted to the 88th meeting; funding was approved for UNEP only and the agreement was updated.

*** At the 88th meeting the UNIDO component was deferred for consideration at the 90th meeting.

Secretariat's recommendation:	For individual consideration
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PROJECT DESCRIPTION

Background

1. At the 76th meeting, the Executive Committee approved, in principle, stage II of the HCFC phase-out management plan (HPMP) for Pakistan² for the period 2016 to 2020 to reduce HCFC consumption by 50 per cent of its baseline, at the amount of US \$5,679,476, consisting of US \$4,776,772, plus agency support costs of US \$334,374 for UNIDO, and US \$503,000, plus agency support costs of US \$65,330 for UNEP.

2. Stage II of the HPMP included the conversion of one enterprise manufacturing air-conditioning (AC) equipment (Dawlance) at a total cost of US \$1,561,720, plus agency support costs, to phase out 7.39 ODP tonnes (134.40 mt) of HCFC-22 used in the manufacture of domestic AC equipment to R-290 technology. At the 83rd meeting, funding of US \$1,115,000 was approved for UNIDO as part of the second tranche of stage II for the implementation of the conversion project.

3. At the 88th meeting, UNIDO submitted a request for funding for the third and final tranche of stage II of the HPMP.³ UNIDO indicated in its tranche implementation report that Dawlance had been purchased by a Turkish company⁴ in 2016 and had begun to manufacture domestic AC equipment based on R-410A refrigerant in the same year (58,000 units/year), due to market demand. UNIDO reported that new equipment to manufacture R-290-based AC equipment had been delivered and installed, and trial and testing has been undertaken; most of the capital cost approved (US \$715,000) had been disbursed, while incremental operating costs (IOC) approved (US \$400,000) had not yet been disbursed⁵. The enterprise had experienced delays in completing the conversion because of difficulties in sourcing completely knocked down (CKD) kits for R-290 and due to the lack of regulations for flammable refrigerants in household AC equipment. The enterprise had manufactured 10 R-290-based AC units, which have been purchased and installed. The full conversion to R-290 technology was expected to be completed by June 2022 if a sustainable source of the CKD kits could be found, and dependent on the market for R-290-based AC equipment.

4. Following this, the Executive Committee approved the third tranche of stage II of the HPMP for Pakistan for the UNEP component only at the amount of US \$103,000, plus agency support costs of US \$13,378 and decided *inter alia* to defer to the 90th meeting, consideration of the UNIDO component, relating to the conversion project at the enterprise Dawlance, at the amount of US \$446,720, plus agency support costs of US \$31,270, and requested UNIDO to submit a detailed progress report on the project implementation for consideration at the 90th meeting (decision 88/72).

5. In line with decision 88/72, on behalf of the Government of Pakistan, UNIDO as the lead implementing agency submitted the abovementioned progress report. UNIDO, on behalf of the Government, also submitted a request for change of technology at the enterprise Dawlance.

² UNEP/OzL.Pro/ExCom/76/42.

³ UNEP/OzL.Pro/ExCom/88/59.

⁴ Arçelik A.S., acquired Dawlance and became the sole shareholder; Arçelik A.S. is owned by Koç Group, one of Turkey's largest industrial conglomerates; the company remained with the same name and has been incorporated with Company Registration Office (CRO) Karachi as Private Limited Company.

⁵ Of the US \$1,115,000 approved under the second tranche for the Dawlance conversion US \$599,959 had been disbursed as of April 2022. The remaining balance of US \$515,041 will be disbursed by 31 December 2023.

Progress on the implementation of the conversion project for the AC manufacturing sector (Dawlance)

6. UNIDO reported that since the 88th meeting, Dawlance continued to implement activities to complete the conversion of Dawlance; however, no new progress was reported as the enterprise was still unable to produce equipment using R-290 except on a very limited scale (i.e., 10 units). During this period, UNIDO initiated the technical evaluation for the procurement of R-290 CKD kits; however, the finalization of the procurement process and delivery of these equipment is not expected until later in 2022. The actual equipment installation and commissioning of the R-290 production line was completed in January 2020 but has not been used for two-years to manufacture R-290 products due to the issues previously identified. The enterprise had continued to produce equipment with R-410A.

Request for change of technology in Dawlance

7. In accordance with paragraph 7(c), of the Agreement between the Government of Pakistan and the Executive Committee, the Government through UNIDO has submitted a request to change the technology for Dawlance from R-290 to HFC-32, which is supported also by the enterprise.⁶

8. UNIDO indicated that the Government of Pakistan and Dawlance are requesting to change the alternative technology to HFC-32 for the following reasons: concerns regarding market acceptance of R-290-based room AC units in the country where R-410A is the prevalent alternative and the greater market acceptability of HFC-32-based AC units which is better known and has higher energy efficiency and cooling capacity ratios; the lack of a regulation or standards that would address safety concerns and facilitate the sales of R-290-based equipment in the country; the lack of supply of R-290 kits; challenges in providing training to the service sector for safe handling of R-290-based equipment; and better parity with the other local AC manufacturers and importers in terms of the market.

9. Incremental capital and operating costs have been revised as shown in Table 1. Cost items related to model re-design, repair and reclamation line, refrigerant transfer and storage were adjusted, and funding was requested for new leak detectors which was not part of the conversion to R-290. Avoided emissions to the atmosphere decreases by about 82,000 mt CO₂.eq. due to the higher global warming potential value of HFC-32 as compared to R-290.

Table 1. Revised incremental cost of the conversion of Dawlance to HFC-32 technology (US \$)

Description	R-290	HFC-32	Difference
Production			
Model redesign	150,000	100,000	50,000
New refrigerant charging boards incorporating the necessary safety features	120,000	120,000	0
Ultrasonic welding	25,000	25,000	0
Retrofit and upgrade of test performance area including safety measure	100,000	100,000	0
Repair and reclamation line after refrigerant charging and test performance	15,000	5,000	10,000
Refrigerant transfer system and storage	40,000	30,000	10,000
New leaks detectors		30,000	(30,000)
Plant Safety			
Ventilation and exhausting system (fans, piping, duct works, grounding, electrical boards/ connections)	65,000	65,000	0

⁶ As per the letter of 14 May 2022 from the Ministry of Climate Change of Pakistan to UNIDO; and the letter of 12 May 2022 from the enterprise Dawlance to UNIDO.

Description	R-290	HFC-32	Difference
Gas sensors, alarm. Monitoring system for entire plant	30,000	30,000	0
Fire protection/ control system for the plant	15,000	15,000	0
Lightning protection and grounding	15,000	15,000	0
Safety audit/ safety inspection and certification	35,000	35,000	0
Technology Transfer			
Technology transfer/training	20,000	20,000	
Trial, prototyping and commission	20,000	20,000	
Total of above cost	650,000	610,000	40,000
Contingencies @ 10 %	65,000	61,000	4,000
Total ICC	715,000	671,000	44,000
Total IOC	846,720	605,340	241,380
Total project cost	1,561,720	1,276,340	285,380

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Progress on the implementation of the conversion project for the AC manufacturing sector (Dawlance)

Requested change in technology

10. In reviewing the tranche request and the requested change in technology, the Secretariat noted that despite Dawlance's commitment to this change to HFC-32, the enterprise continues to face challenges with respect to product and consumer safety, as HFC-32 is also a flammable refrigerant. It was further noted that Dawlance had indicated that it may risk losing its current market share because of their commitment to producing HFC-32-based equipment, while the AC manufacturing sector in Pakistan produces products based on R-410A. UNIDO explained that the enterprise, while aware of these challenges is committed to this conversion and has in fact invested financial resources in research and development for this technology. In the letter of commitment from Dawlance provided by UNIDO, the enterprise commits to complete the conversion project by December 2023, targeting that 80 per cent of their production for AC equipment with capacity of 12k BTU, 18k BTU and 24k BTU would be based on HFC-32. Full production would be completed by December 2024.

11. UNIDO also indicated that in addition to the full conversion to HFC-32, since the enterprise is already fully equipped to also produce R-290 products, it will continue production of demonstration equipment to understand the feasibility of hydrocarbon technologies, including the measures for safety, energy efficiency, and performance of new technologies as well as the environmental benefits. This will provide the country more technical options to phase down HFCs after the country ratifies the Kigali Amendment.

12. The Secretariat queried on the availability of HFC-32 compressors in Pakistan noting that one of the difficulties in the R-290 conversion was the lack of R-290 kits. UNIDO indicated that there were no issues with sourcing HFC-32-based compressors in Pakistan, and that suppliers had already indicated their willingness to supply these to Dawlance.

13. The incremental capital and operating costs as provided in Table 1 above were agreed as these were consistent with costs for similar conversions to HFC-32 in other countries and enterprises. On this basis, the total cost of conversion to HFC-32 was agreed at US \$1,276,340 resulting in a saving of US \$285,380 from the funding originally approved in principle for R-290 which was US\$1,561,720. Subsequently, the

funding for the third and final tranche for this component for UNIDO has been adjusted to US \$161,340, plus agency support costs of US \$11,293 (from US \$446,720, plus agency support costs of US \$31,270).

Revision to the stage II HPMP Agreement

14. The Agreement between the Government of Pakistan and the Executive Committee for stage II of the HPMP which had been updated at the 88th meeting is further updated to reflect the adjusted amount for the UNIDO component of the fourth tranche as shown in Table 2, and contained in Annex I to the present document, changes are in bold for ease of reference. The full updated Agreement will be appended to the report of the 90th meeting.

Table 2. Revised tranche distribution for stage II of the HPMP for Pakistan

ORIGINAL									
Particulars	2016	2017	2018	2019	2020	2021	2022	2023	Total
Lead IA (UNIDO) agreed funding (US \$)	2,350,200	0	1,979,852	619,938	0	0	446,720	0	5,396,710
Support costs for Lead IA (US \$)	164,514	0	138,590	43,396	0	0	31,270	0	377,770
Cooperating IA (UNEP) agreed funding (US \$)	200,000	0	200,000	0	0	103,000	0	0	503,000
Support costs for Cooperating IA (US \$)	25,976	0	25,976	0	0	13,378	0	0	65,330
Total agreed funding (US \$)	2,550,200	0	2,179,852	619,938	0	103,000	446,720	0	5,899,710
Total agency support costs (US \$)	190,490	0	164,566	43,396	0	13,378	31,270	0	443,100
Total agreed costs (US \$)	2,740,690	0	2,344,418	663,334	0	116,378	477,990	0	6,342,810
REVISED									
Lead IA (UNIDO) agreed funding (US \$)	2,350,200	0	1,979,852	619,938	0	0	161,340	0	5,111,330
Support costs for Lead IA (US \$)	164,514	0	138,590	43,396	0	0	11,293	0	357,793
Cooperating IA (UNEP) agreed funding (US \$)	200,000	0	200,000	0	0	103,000	0	0	503,000
Support costs for Cooperating IA (UNEP) (US \$)	25,976	0	25,976	0	0	13,378	0	0	65,330
Total agreed funding (US \$)	2,550,200	0	2,179,852	619,938	0	103,000	161,340	0	5,614,330
Total agency support costs (US \$)	190,490	0	164,566	43,396	0	13,378	11,293	0	423,123
Total agreed costs (US \$)	2,740,690	0	2,344,418	663,334	0	116,378	172,633	0	6,037,453

Sustainability of the HCFC phase-out

15. The Government's commitment to support the completion of the conversion project at the Dawlance enterprise, as one of the primary domestic AC manufacturers in the country, will help to establish the market for alternative technologies in Pakistan. Additionally the enterprise's commitment to continue the production of R-290 demonstration products will provide more technical options to phase down HFCs after the country has ratified the Kigali Amendment. Forthcoming bans such as on the import of products and equipment containing HCFCs, on investments in new plants using HCFCs, and on the uncontrolled release of HCFC during servicing are being studied and will be implemented as part of stage III of the HPMP.

Conclusion

16. The enterprise Dawlance experienced difficulties in its conversion to R-290 for various reasons and has requested for the change in technology to HFC-32. To support the request, the enterprise submitted a letter committing to complete the conversion by December 2023, targeting that 80 per cent of their production for AC equipment would be based on HFC-32 and full production would be completed by December 2024. The change in technology for the conversion of the AC manufacturing enterprise to HFC-32 from R-290 will allow for the completion of the conversion and provide the Government of Pakistan with an option for low-GWP alternatives in the AC sector. These will also be supported with training activities for handling flammable refrigerants which were part of the UNEP activities approved for the third tranche, at the 88th meeting.

RECOMMENDATION

17. The Executive Committee may wish:

- (a) To note the progress report on the implementation of the project to convert the manufacturing of domestic air-conditioners from HCFC-22 to R-290 at the enterprise Dawlance, submitted by UNIDO in line with decision 88/72(c);
- (b) To further note the request submitted by UNIDO, on behalf of the Government of Pakistan, for the change of technology at the enterprise Dawlance from R-290 to HFC-32, and the commitment of the enterprise to convert 80 per cent of its production of air-conditioning equipment to HFC-32 by December 2023;
- (c) To consider whether to approve the request for the change of technology at the enterprise Dawlance from R-290 to HFC-32, at the total project cost of US \$1,276,340, plus agency support costs of US \$89,344 for UNIDO; and to approve the fourth and final tranche of stage II of the HPMP for Pakistan, and the corresponding 2022-2024 implementation plan, at the amount of US \$161,340, plus agency support costs of US \$11,293 for UNIDO;
- (d) To note that the enterprise Dawlance would not be eligible for further funding from the Multilateral Fund;
- (e) To note also that the Fund Secretariat would update the Agreement between the Government of Pakistan and the Executive Committee, as contained in Annex I to the present document, specifically Appendix 2-A, on the basis of the adjusted allocation of funding for the UNIDO component of the fourth tranche referred to in sub-paragraph (c) above; and paragraph 16, to indicate that the revised updated Agreement superseded that reached at the 88th meeting; and
- (f) To request the Government of Pakistan, and UNIDO to submit progress reports on a yearly basis on the implementation of the work programme associated with the third and fourth tranches until the completion of the project and the project completion report to the first meeting of 2025.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Pakistan

(I) PROJECT TITLE	AGENCY
HCFC phase-out plan (stage III)	UNIDO (lead), UNEP

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	122.21 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2021	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCFC-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCFC-141b	0.00	8.03	0.00	0.00	0.00	0.00	0.00	0.00	8.03
HCFC-142b	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCFC-22	0.00	1.69	0.00	2.70	108.14	0.00	0.00	0.00	112.53

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	248.11	Starting point for sustained aggregate reductions:	248.11
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	156.76	Remaining:	89.68

(V) BUSINESS PLAN		2022	2023	2024	Total
UNIDO	ODS phase-out (ODP tonnes)	18.20	0.00	11.5	29.70
	Funding (US \$)	1,496,000	0	1,071,000	2,567,000
UNEP	ODS phase-out (ODP tonnes)	8.10	4.3	5.00	17.40
	Funding (US \$)	705,000	375,000	436,000	1,516,000

(VI) PROJECT DATA		2022	2023	2024	2025	2026	2027-2028	2029	2030	Total	
Montreal Protocol consumption limits		161.27	161.27	161.27	80.63	80.63	80.63	80.63	0	n/a	
Maximum allowable consumption (ODP tonnes)		124.06	124.06	124.06	80.63	80.63	80.63	80.63	0	n/a	
Projects costs requested in principle (US \$)	UNIDO	Project costs	1,468,883	0	1,049,800	0	867,400	0	0	478,000	3,864,083
		Support costs	102,822	0	73,486	0	60,718	0	0	33,460	270,486
	UNEP	Project costs	426,750	0	737,154	0	596,030	0	0	280,730	2,040,664
		Support costs	49,034	0	84,699	0	68,484	0	0	32,256	234,473
Total project costs requested in principle (US \$)		1,895,633	0	1,786,954	0	1,463,430	0	0	758,730	5,904,747	
Total support costs requested in principle (US \$)		151,856	0	158,185	0	129,202	0	0	65,716	504,959	
Total funds requested in principle (US \$)		2,047,489	0	1,945,139	0	1,592,632	0	0	824,446	6,409,706	

(VII) Request for approval of funding for the first tranche (2021)		
Agency	Funds requested (US \$)	Support costs (US \$)
UNIDO	1,468,883	102,822
UNEP	426,750	49,034
Total	1,895,633	151,856

Secretariat's recommendation:	Individual consideration
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PROJECT DESCRIPTION

Background

18. On behalf of the Government of Pakistan, UNIDO as the lead implementing agency, has submitted a request for stage III of the HCFC phase-out management plan (HPMP), at a total cost of US \$6,274,663, consisting of US \$3,808,000, plus agency support costs of US \$266,560 for UNIDO, and US \$1,973,066, plus agency support costs of US \$227,037 for UNEP, as originally submitted.⁷ The implementation of stage III of the HPMP will phase out the remaining consumption of HCFCs by 2030.

19. The first tranche of stage III of the HPMP being requested at this meeting amounts to US \$2,318,711, consisting of US \$1,734,800, plus agency support costs of US \$121,436 for UNIDO, and US \$414,750, plus agency support costs of US \$47,725 for UNEP, as originally submitted.

Status of implementation of stage II of the HPMP

20. Stage I of the HPMP for Pakistan was originally approved at the 62nd meeting⁸ and revised at the 70th meeting⁹ to meet the 10 per cent reduction from the baseline by 2015, at a total cost of US \$5,448,849, plus agency support costs, to phase out 7.4 ODP tonnes of HCFCs used in the refrigeration and air-conditioning (RAC) servicing sector and 71.7 ODP tonnes in the polyurethane foam (PU) manufacturing sector. Stage I of the HPMP was completed in December 2016.

21. Stage II of the HPMP for Pakistan was originally approved at the 76th meeting¹⁰ and revised at the 83rd and 88th meetings^{11, 12} to meet the 50 per cent reduction from the baseline by 2020, at a total cost of US \$5,899,710, plus agency support costs, to phase out 77.66 ODP tonnes of HCFCs used in the refrigeration and air-conditioning (RAC) servicing and air-conditioning (AC), PU and extruded polystyrene (XPS) foam manufacturing sectors.

22. The third and final tranche of stage II of the HPMP was approved at the 88th meeting in November 2021, except for the remaining funding for UNIDO for the investment project in the domestic AC sector which is submitted for consideration to this meeting.¹³ Stage II of the HPMP is expected to be completed by December 2024.

HCFC consumption

23. The Government of Pakistan reported under country programme (CP) implementation report a consumption of 120.56 ODP tonnes of HCFC in 2021, which is 51 per cent below the HCFC baseline for compliance. The 2017-2021 HCFC consumption is shown in Table 3.

Table 3. HCFC consumption in Pakistan (2017-2021 Article 7 data)

HCFC	2017	2018	2019	2020	2021*	Baseline
Metric tonnes						
HCFC-22	2,696.84	2,806.38	2,752.41	2,021.71	2045.99	1,908.25
HCFC-123	2.09	0.00	0.00	0.00	0.00	0.00
HCFC-141b	504.16	298.67	495.50	73.00	73.00	1,259.10
HCFC-142b	46.02	46.00	44.00	46.00	0.00	71.55
Total (mt)	3,249.11	3,151.05	3,291.91	2,140.71	2118.99	3,238.90

⁷ As per the letter of 28 February 2022 from the Ministry of Climate Change of Pakistan to UNIDO.

⁸ UNEP/OzL.Pro/ExCom/62/44 and Annex XXII of UNEP/OzL.Pro/ExCom/62/62.

⁹ Annex XVIII of UNEP/OzL.Pro/ExCom/70/59.

¹⁰ UNEP/OzL.Pro/ExCom/76/42 and Annex X of UNEP/OzL.Pro/ExCom/76/66.

¹¹ Annex XI of UNEP/OzL.Pro/ExCom/83/48.

¹² Annex XXXV of UNEP/OzL.Pro/ExCom/88/79.

¹³ Paragraphs 1 to 17 of this document

HCFC	2017	2018	2019	2020	2021*	Baseline
HCFC-141b in imported pre-blended polyols**	0.00	0.00	0.00	690.00	0.00	n/a
ODP tonnes						
HCFC-22	148.33	154.35	151.38	111.19	112.53	104.95
HCFC-123	0.04	0.00	0.00	0.00	0.00	0.00
HCFC-141b	55.46	32.85	54.51	8.03	8.03	138.50
HCFC-142b	2.99	2.99	2.86	2.99	0.00	4.65
Total (ODP tonnes)	206.82	190.19	208.75	122.21	120.56	248.11
HCFC-141b in imported pre-blended polyols*	0.00	0.00	0.00	75.90	0.00	n/a

* CP data

24. Since the implementation of stage II of the HPMP, the HCFC consumption has shown an overall decline except for an increase of the consumption of HCFC-141b in 2019, followed by a sharp decline in 2020, due to the conversion of several foam manufacturing enterprises. The consumption of HCFC-142b is associated with the demand for XPS foam boards for insulation, which is expected to be phased out in 2023 when the conversion of one XPS foam manufacturing enterprise to dimethyl ether (DME)/CO₂/HFO technology will be completed. The major reduction in the consumption of HCFC-22 in 2020 was due to the conversion of domestic and commercial AC manufacturing enterprises to R-410A-based refrigerant, funded with their own resources, and to an increase in the production and import of R-410A-based domestic AC units due to market demand.

25. Under its CP data report, the Government of Pakistan reported for the first time a consumption of 75.90 ODP tonnes of HCFC-141b contained in imported pre-blended polyols for 2020 (equivalent to 55 per cent of the HCFC-141b baseline) and zero consumption of this substance in 2021. At the 88th meeting the Government of Pakistan committed to monitor and report in its CP implementation report on the use of HCFC-141b contained in pre-blended polyols and to establish monitoring mechanisms to ensure that the converted foam manufacturing enterprises were no longer using HCFC-141b, either pure or contained in pre-blended polyols; UNIDO explained that these monitoring mechanisms are presently under development and the consumption of this substance will be reported in future tranches.

CP implementation report

26. The Government of Pakistan reported HCFC sector consumption data under the 2020 CP implementation report that is consistent with the data reported under Article 7 of the Montreal Protocol. The Article 7 data for 2021 has not been reported yet.

Status of progress and disbursement

Legal framework

27. The licensing and quota system for the import and export of HCFCs has been operational since 2013; the importation of previously phased-out ODS substances is banned; HCFC-142b was added to the list of controlled substances under regulation SRO 634(1) as part of Pakistan's Customs Rules which was updated in 2014. The Government is continuing to examine, *inter alia*, additional regulations including a ban on the import of products and equipment using or containing HCFC and HCFC blends; tax relief on non-HCFC-based products and higher taxes on HCFC-based products; a ban of new enterprises manufacturing refrigerators, AC equipment and foam products using HCFC or HCFC blends; a ban on the installation of manufacturing enterprises using HCFC and/or HCFC blends; and guidelines for handling, transportation, storage and disposal of ODS, and for end of life management of RAC equipment. These are part of the stage III implementation.

28. During stage II of the HPMP, Customs incorporated HCFC imports into a web-based one stop system for license and quota management (Web Based One Customs). Fifty customs officers have been trained on the identification of refrigerants, the use of refrigerant identifiers, and HS codes, and three participated in a regional risk profiling workshop. The remaining training of customs officers under stage II is expected to be completed by December 2023.

Manufacturing sectors

PU foam

29. Stage II of the HPMP included the conversions of seven enterprises manufacturing PU thermoware (i.e., Shoabee Industries, Asif Zubair and Co., Decent Plastic, Delight Plastic, Full Bright Industries, Tropical Plastic, and Unique Plastic) and other small enterprises, with an aggregated consumption of 34.05 ODP tonnes (309.5 mt) of HCFC-141b. The conversions of all these enterprises to water-blown technology have been completed resulting in the actual phase-out of 31.21 ODP tonnes (283.75 mt) of HCFC-141b.

30. Stage II also included the conversion of four enterprises manufacturing PU discontinuous panels (i.e., Foster Refrigerators, Koldkraft Refrigeration, Pakistan Air-Conditioning Engineering Co. (Pvt.) Ltd. (PAECO), and Pakistan Insulation) and other small enterprises to cyclopentane, with an aggregated consumption of 24.64 ODP tonnes (224.02 mt) of HCFC-141b. Contracts were signed between the Government of Pakistan, UNIDO and the beneficiary enterprises during last quarter of 2020; all four enterprises have agreed on the specifications of equipment with the supplier; procurement has been finalized and equipment was delivered to three enterprises (Foster, Koldkraft, and PAECO) and delivery to the fourth enterprise (Pakistan Insulation) is expected by the end of May 2022. Installation, testing and commissioning was carried out at Koldkraft and some necessary modifications were identified and this process will be carried out at Foster by June 2022. The conversions are all expected to be completed by 31 December 2022. Technical assistance continues to be provided for the small enterprises and a dissemination workshop is planned after the first two conversion projects are finished (Foster and Koldkraft) to share lessons learned and results of the demonstration project.

XPS foam

31. At the 84th meeting, the Executive Committee approved an investment project to phase out 1.69 ODP tonnes (30.73 mt) of HCFC-22 and 2.99 ODP tonnes (46 mt) of HCFC-142b used by Symbol Industry in the manufacturing of XPS foam boards, through the conversion to dimethyl ether (DME)/CO₂/HFO technology.¹⁴ The bidding for the equipment required for the conversion was initiated in mid-2020, and subsequently canceled due to insufficient quality of the bids received; a second bidding process was completed, the equipment successfully delivered as of March 2022 and the installation, testing and trials completed in April 2022. The conversion will be completed by 31 December 2022.

Residential AC

32. Under the second tranche of stage II, funding was approved for the phase-out of 7.39 ODP tonnes (134.40 mt) of HCFC-22 used in the manufacturing of domestic AC equipment by Dawlance Private Limited, Karachi, to R-290 technology.¹⁵ At the 88th meeting the Executive Committee requested that UNIDO provide at the present meeting, a detailed report on progress in the implementation of the project. The update on progress of the conversion for Dawlance is discussed in paragraphs 1 to 17 of this document.

¹⁴ Decision 84/78.

¹⁵ The project was approved in principle at the 76th meeting when stage II of the HPMP was approved. Funding for the conversion was approved at the 83rd meeting (May 2019).

Refrigeration servicing sector

33. A total of 782 RAC technicians were trained on good servicing practices and the safe use of hydrocarbon (HC) refrigerants, through eleven workshops from 2017-2021. The UNEP guide on flammable refrigerants was translated into Urdu and 5,000 copies were distributed to technical institutes, technicians and other stakeholders. To overcome the constraints imposed by the COVID-19 pandemic, virtual training courses were explored; however, this approach was not well received by most technicians due to limitations on the quality of the communications.

34. The National Ozone Unit (NOU) held meetings with the RAC associations and distributed awareness materials on the phase-out of HCFCs and the impact of alternative refrigerants on the climate to encourage the transition to non-HCFC-based RAC equipment with low-GWP refrigerants. A workshop on alternative technologies and the handling of flammable refrigerants was held for 400 participants including importers, industry stakeholders, academics, and traders; a heating, ventilation, air-conditioning, and refrigeration conference was held for 200 participants from industry and large end-users; an event for world refrigeration day was organized; and an awareness workshop on matters related to the Montreal Protocol was held for 200 participants. Over 2,000 copies of awareness material for the public, which included material available on OzonAction website related to the Kigali Amendment, cold chain supply and new refrigerants, were distributed.

35. Consultation meetings were held with the Sindh Board of Technical Education (SBTE) on the feasibility of including good servicing practices in the certification programme for technicians; a pilot certification programme was developed to support the implementation of a National Vocational Qualification Framework which requires proper assessment of knowledge and skills and recognizes past learning and practical experience under the Recognition of Prior Learning (RPL). The National Vocational and Technical Training Commission will incorporate good servicing practices and matters related to the Montreal Protocol in the vocational curriculum for schools across the country, ensuring regular updates of the curriculum to include new developments in alternative technologies and commitments under the Montreal Protocol. The training and certification of an initial 200 RAC technicians under stage II is expected to be completed by December 2023. Based on the results of this pilot programme, the certification process will be introduced to the other provinces in stage III of the HPMP, each province has jurisdiction over its provincial technical and vocational training institutes and will decide whether the approach will be implemented.

36. A recommendation to adopt international standards related to refrigerant designation and safety classification; operation, maintenance, and repair of RAC equipment; and recovery of refrigerants was prepared with assistance from UNEP for approval of the Government, to facilitate the introduction of RAC equipment using low-GWP refrigerants. Standard operating procedures for handling of flammable and toxic refrigerants were finalized; these will be used to develop national standards which is expected to be completed by December 2023.

Level of fund disbursement

37. As of April 2022, of the total funds of US \$5,452,990 approved (US \$4,949,990 for UNIDO and US \$503,000 for UNEP), US \$2,939,629 has been disbursed (US \$2,666,080 for UNIDO and US \$273,549 for UNEP). UNIDO confirmed that the balance of US \$2,513,361 will be disbursed by December 2023 including the remaining balance of US \$515,041 associated with the conversion project in Dawlance.

Stage III of the HPMP

Remaining consumption eligible for funding

38. After deducting 79.1 ODP tonnes of HCFCs (i.e., 7.4 ODP tonnes of HCFC-22 and 71.7 ODP tonnes of HCFC 141b) associated with stage I of the HPMP and deducting 77.66 ODP tonnes of HCFCs (i.e. 15.98 ODP tonnes of HCFC-22, 58.69 ODP tonnes of HCFC-141b and 2.99 ODP tonnes of HCFC-142b¹⁶) associated with stage II of the HPMP, and deducting the voluntary phase-out of 26.24 ODP tonnes of HCFCs (24.58 ODP tonnes of HCFC-22 in the RAC manufacturing sector and 1.66 ODP tonnes of HCFC-142b in the XPS foam sector) the remaining consumption eligible for funding in stage III amounts to 65.10 ODP tonnes of HCFCs (i.e., 56.99 ODP tonnes of HCFC-22 and 8.11 ODP tonnes of HCFC-141b), as shown in Table 4 below:

Table 4. Overview of the remaining HCFC consumption eligible for funding ODP tonnes

HCFC	Baseline/ Starting point	Reduction in stage I	Reduction in stage II	Voluntary reductions	Remaining eligible consumption
HCFC-22	104.96	7.40	15.98	24.58*	56.99
HCFC-141b	138.5	71.70	58.69	0.00	8.11
HCFC-142b	4.65	0.00	2.99	1.66**	0.00
Total	248.11	79.10	77.66	26.24	65.10

* A voluntary phase out of 24.58 ODP tonnes of HCFC-22 in the RAC manufacturing sector as enterprises converted on their own to R-410A.

** All consumption of HCFC-142b will be phased out with the project for the XPS foam sector.

Sector distribution of HCFCs

39. There are approximately 50,000 RAC technicians and 9,331 workshops (2,868 are company sponsored and an estimated 6,463 are informal workshops) in the servicing sector, consuming HCFC-22 to service residential and commercial AC, as well as commercial and industrial refrigeration using HCFC-22, HCFC-141b and HCFC-142b in manufacturing as shown in Table 5. The consumption of HCFCs in Pakistan is mostly in the servicing sector (82 per cent) while its use in the manufacturing sector was only 18 per cent. In addition, HCFCs accounted for 44 per cent of the consumption of refrigerants used in the servicing sector in 2020 followed by HFC-134a (40 per cent), R-410A (13 per cent), and R-407c, R-404a and R-422d (at 1 per cent each).

Table 5. Estimated demand for consumption of HCFCs Pakistan in 2021*

Application	Estimated consumption		Percentage of total ODP tonnes
	mt	ODP tonnes	
Manufacturing sector			
HCFC-22			
Air-conditioning	52.8	2.90	3
XPS board	30.8	1.69	2
Other HCFCs			
HCFC-141b in PU foam	73.4	8.07	9
HCFC-142b in XPS board	46.2	2.99	3
Sub-total in manufacturing sector	203.2	15.65	18
Servicing sector			
HCFC-22			
Domestic Acs	1,243.34	68.38	77
Commercial, industrial ACs and chillers	64.02	3.52	4
Transport refrigeration	0.72	0.04	0
Large commercial refrigeration	13.35	0.73	1

¹⁶ The country had agreed to phase out all consumption of HCFC-142b (1.66 ODP tonnes) with the funding provided for the XPS foam project which is reflected in a revised Agreement at the 84th meeting.

Application	Estimated consumption		Percentage of total ODP tonnes
	mt	ODP tonnes	
Industrial refrigeration	3.47	0.19	0
Sub-total in servicing sector	1,324.90	72.86	82
Total	1,528.1	88.51	100

*Estimates of 2021 consumption provided prior to CP data.

40. HCFC-22-based domestic AC manufacturing accounted for only 3 per cent of AC manufacturing in 2020, while 97 per cent of production was based on R-410A; use of HCFC-22 in the manufacturing of commercial AC equipment accounted for 80 per cent in 2020 followed by R-407c at 20 per cent.

Phase-out strategy in stage III of the HPMP

41. Stage III of the HPMP will build upon the experience gained during the implementation of stage I and stage II; it will continue to focus on phasing out the remaining consumption of HCFC-141b in the foam sector, HCFC-22 in the domestic and commercial AC manufacturing sub-sectors and remaining HCFC-22 in the servicing sector. The phase-out strategy in the servicing sector includes continuing to strengthen customs and enforcement, RAC technician training and certification, and developing recycling, recovery and reclamation (RRR). Through implementation of stage III of the HPMP, 65.18 ODP tonnes of HCFCs will be phased out, consisting of 56.99 ODP tonnes of HCFC-22 in the refrigeration servicing sector, and 8.19 ODP tonnes of HCFC-141b used in foam manufacturing.¹⁷

Proposed activities in stage III of the HPMP

Foam manufacturing sector

42. Stage III includes the conversion of six remaining eligible enterprises:

- (a) Two individual enterprises in the PU foam sector, one manufacturing insulation foam for commercial refrigeration (Cool Point Lahore) and one manufacturing PU foam for pipe insulation (Islam ud Din) to cyclopentane to phase out a total of 2.92 ODP tonnes (26.53 mt) of HCFC-141b; and
- (b) An umbrella project for four enterprises manufacturing spray foam (Symbol Industries, Master Foam Karachi, Master Foam, Lahore, Razi Sons) to water blown technology to phase out 5.27 ODP tonnes (47.80 mt) of HCFC-141b.

43. All enterprises are 100 per cent locally owned, and the conversion of these remaining enterprises will phase out all consumption of HCFC-141b in foam manufacturing in Pakistan. For the individual foam enterprises converting to cyclopentane, the incremental capital costs (ICC) included the installation of HC storage and mixing stations, replacement of foam dispensers (where applicable); jigs and fixtures, safety related equipment; and training, trials and safety audits. For the spray foam enterprises converting to water blown technology, the ICC included the replacement of foam dispensers and testing, trials, and commissioning. No incremental operating costs (IOC) were requested for these enterprises. A summary of the foam investment projects is presented in Table 6 below.

¹⁷ Based on average consumption on the enterprises in the foam manufacturing sector from 2019-2021

Table 6. Total cost of the conversion of six enterprises in the foam sector

Enterprise	HCFC-141b average consumption 2019-2021		Cost (US \$)			C.E.
	mt	ODP tonnes	ICC	IOC	Total	(US \$/kg)
Individual foam enterprises						
Cool Point Lahore	9.83	1.08	198,000	0	198,000	20.14
Islam ud Din	16.7	1.84	165,000	0	165,000	9.88
Sub-total	26.53	2.92	363,000	0	363,000	-
Spray Foam						
Symbol Industries, Lahore	18.9	2.08	159,500	0	159,500	8.44
Master Foam, Karachi	8.7	0.96	82,500	0	82,500	9.48
Master Foam, Lahore	5.87	0.65	82,500	0	82,500	14.05
Razi Sons, Karachi	14.33	1.58	82,500	0	82,500	5.76
Subtotal	47.80	5.27	407,000	0	407,000	-
Total	74.33	8.19	770,000	0	770,000	10.36

Activities in the refrigeration servicing sector

44. Stage III includes activities for the servicing sector at a cost of US \$4,436,066, with an associated phase-out of 56.99 ODP tonnes of HCFC-22. The activities for the servicing sector to be implemented in stage III of the HPMP as originally submitted, are summarized in Table 7.

Table 7. Servicing sector activities to be implemented in stage III of the HPMP

Project component	Planned activities	Agency	Cost (US \$)
<i>Policy and regulations study and development</i>	<ul style="list-style-type: none"> Review and development of policy and regulations to support HCFC phase-out including six consultation meetings with stakeholders and six public consultations and workshops; Development and implementation of an e-licensing system for imports including system hardware and software and three training sessions for the NOU, licensing authority, and importers on the system and issuance of e-permits; A feasibility study of legal framework to regulate RAC servicing sector; development of e-registration for local servicing workshops; and The installation of e-registration system and training for local authorities. 	UNEP	302,600
	<ul style="list-style-type: none"> Development of policies and standards for reclaim centres. 	UNIDO	20,000
<i>Enforcement and customs training</i>	<ul style="list-style-type: none"> Training of customs officers including two train the trainers' workshops in 2024 and 2027 and sixteen training workshops for new and existing customs officers on Montreal Protocol and HCFC control including risk profiling; Organization of three regional/cross-border enforcement cooperation meetings; Four training workshops for provincial enforcement officers to support enforcement beyond the customs check point and five related training workshops for customs agents and importers; and Support to the customs authorities to strengthen risk profiling including identifying risk areas, risk indicators, selectivity criteria and development of criteria for risk profiling. 	UNEP	253,266
	<ul style="list-style-type: none"> Acquisition of 10 refrigerant identifiers to support the import/export control. 	UNIDO	50,000
<i>Capacity Building of RAC servicing technicians</i>	<ul style="list-style-type: none"> Eighty training workshops for 2,400 RAC technicians on good servicing practices; update and organize two master trainers' workshops in 2024 and 2027; four training workshops for 180 trainees on good servicing practices for large commercial air conditioners/chillers in 2024 and 2027; Integration of good servicing practices into National Qualification 	UNEP	1,146,000

Project component	Planned activities	Agency	Cost (US \$)
<i>and workshops</i>	<p>Framework and National Occupational Competency Standards;</p> <ul style="list-style-type: none"> Assisting the provincial boards to update the training syllabus in six provinces/administrative areas; two trainings per province/admin area to teachers based on new curriculum with good servicing practices; and Assisting assessment and qualification awarding bodies to update RPL evaluation criteria to cover the good servicing practices components; two trainings each in six provinces/administrative areas for the assessors based on new competency-based assessment with good servicing practices; and the initial certification of 1000 RAC technicians through RPL campaign. 		
	<ul style="list-style-type: none"> Provide 12 sets of tools/equipment to the training schools and the qualification assessment awarding institutes¹⁸; and Acquire 720 sets of tools/equipment for selected servicing workshops.¹⁹ 	UNIDO	1,008,000
<i>National recycling, recovery and reclamation scheme</i>	<ul style="list-style-type: none"> Develop guidelines and business model for reclamation facilities and certification procedure for reclamation facilities, RAC technicians and servicing workshops; Establish four national RRR centres including refrigerant reclaim, laboratory equipment, consumables, transportation, installation and training²⁰; acquire and deliver 400 service kits to build RRR networks²¹; and Establish four training centres at selected technical colleges and conduct 16 awareness workshops and training for 400 RAC technicians on RR&R. 	UNIDO	1,114,000
<i>Promotion of alternative technologies</i>	<ul style="list-style-type: none"> Study tours and webinars for 12 industries to other countries to exchange information on the development of low-GWP technologies; Collaboration with RAC associations to disseminate information on new emerging technologies in RAC manufacturing and servicing; Nine consultation /coordination meetings to promote alternative technologies with relevant stakeholders (e.g., industry and government); Research on safety and performance of low-GWP technologies; a feasibility study on the final disposal of unwanted refrigerants; a review of current regulations and policies on chemicals and waste management; and evaluate the national institutional capacity for environmentally sound management of ODS and develop technical roadmap for ODS destruction; a feasibility study on establishing a country-wide registration system including tracking of refrigerant management; and Technical assistance to big end-user to reduce leaks and transition into non-ODS and low GWP alternatives. 	UNIDO	371,000
<i>Awareness Raising and Campaigns</i>	<ul style="list-style-type: none"> Production and distribution of printed materials (e.g., newspaper advertisements, articles in journals) and through mass media (e.g., short films) in local language; celebration of the world refrigeration day; continuing annual Ozone2Climate roadshow and roundtable; and Outreach for the launch of the RPL programme to disseminate the information on the training programme and promote the PRL certificate. 	UNEP	171,200
Total			4,436,066

¹⁸ Refrigerant identifiers, recovery machines including A3 flammable refrigerants, dual stage vacuum pumps, portable recovery machine, oxygen free dry nitrogen cylinder, recovery cylinders, brazing kits, portable charging station for HC, electronic leak detector for HC, various hose, scales, gauges, thermometers, clamps, valves, cutters, etc.

¹⁹ Recovery station for R-22, charging unit, vacuum pumps, refrigerant weighted scales, vacuum gauges, leak detectors for HC, refillable cylinders, etc.

²⁰ Including *inter alia* recovery unit for R-22, reclaim station, refrigerant identifier, cylinders, leak detector, gas chromatograph, filter chiller unit, electric liquid transfer pump.

²¹ Including *inter alia* cylinders, manifolds and gauges, hoses, valves, recovery station for HCFC, vacuum pump, charging unit, brazing equipment, safety equipment.

Project implementation and monitoring

45. The NOU will monitor activities, report progress, work with stakeholders and for stage III will also collect gender indicators. The cost of monitoring activities for stage III amounts to US \$575,000 (US \$475,000 for UNIDO and US \$100,000 for UNEP), which will be allocated to staff and consultants (US \$288,000); rent (US \$100,000), travel and meetings (US \$177,250); project monitoring and reporting and other expenses (US \$9,750).

Gender policy implementation

46. In line with decision 84/92(d)²², stage III implementation will consider gender mainstreaming in all aspects of the project including the investment and non-investment components. The gender mainstreaming policies shall also extend to the selection of the consultants, implementation team, and project monitoring team. An effort will be made to ensure active participation of women in the consultative workshops, stakeholders’ meetings and the training of technicians, customs officers and enforcement officers. The NOU will aim to seek stakeholders’ inputs on how to integrate gender specific indicators in planning, implementation, and the reporting process of each component. UNIDO’s manual for the integration of gender mainstreaming into Montreal Protocol activities will be used to ensure the identification of indicators.

Total cost of stage III of the HPMP

47. The total cost of stage III of the HPMP for Pakistan, as originally submitted, for achieving 100 per cent reduction from its HCFC baseline consumption by 2030, has been estimated at US \$5,781,066 plus agency support costs. The proposed activities will enable the country to achieve 100 per cent reduction in HCFC baseline consumption by 2030, and result in the phase-out of 65.18 ODP tonnes (i.e., 56.99 ODP tonnes of HCFC-22; and 8.19 ODP tonnes of HCFC-141b) with an overall cost-effectiveness of US \$5.21/kg as summarized in Table 8.

Table 8. Total cost of stage III of the HPMP for Pakistan as submitted

Activity	Substance	HCFC phase-out		Cost (US \$)	C.E. (US \$/kg)
		mt	ODP tonnes		
Conversion of six enterprises in the foam sector	HCFC-141b	74.33	8.19	770,000	10.36
Refrigeration servicing activities	HCFC-22	1036.18	56.99	4,436,066	4.28
PMU	n/a	n/a	n/a	575,000	n/a
Total	n/a	1,110.51	65.18	5,781,066	5.21

Activities planned for the first tranche of stage III

48. The first funding tranche of stage III of the HPMP at the total amount of US \$2,149,550 will be implemented between July 2022 and December 2024 and will include the following activities:

- (a) *Conversion of six enterprises in the foam sector*: conversion of the two individual enterprises in the PU insulation foam sector and four spray foam enterprises including developing specification of equipment, procurement, delivery, installation, and commissioning (UNIDO) (US \$770,000);

²² Decision 84/92(d) requested bilateral and implementing agencies to apply the operational policy on gender mainstreaming throughout the project cycle.

- (b) *Policy/regulations study and development:* a review of existing policy and regulations to identify needs to support HCFC phase-out including the servicing tail; conducting consultation meetings; development of an e-licencing system including an assessment of hardware and software required; a feasibility study of legal framework to regulate RAC servicing sector (UNEP) (US \$118,950);
- (c) *Enforcement and customs training:* one train the trainers' workshop in 2024 with international experts; four training workshops for a total of 80 customs officers on Montreal Protocol and HCFC control including risk profiling; one training workshop for customs agents and importers to support enforcement beyond the customs check point (UNEP) (US \$55,000);
- (d) *Capacity Building of RAC servicing training:* organize 20 training workshops for 600 RAC technicians on good servicing practices; update and organize a master trainers' workshop in 2024; organize two training workshops for 90 trainees on good servicing practices for large commercial air conditioners/chillers in 2024; hire a consultant to integrate good servicing practices into National Qualification Framework and National Occupational Competency Standards (UNEP) (US \$178,000);
- (e) *Capacity Building of RAC servicing/tools and equipment:* provide training and tools/equipment to six training schools and the qualification assessment awarding institutes (e.g. refrigerant identifiers, recovery machines including A3 flammable refrigerants, dual stage vacuum pumps, portable recovery machine, oxygen free dry nitrogen cylinder, recovery cylinders, brazing kits, portable charging station for HC, electronic leak detector for HC, various hose, scales, gauges, thermometers, clamps, valves, cutters, etc.); acquire 144 sets of tools/equipment for selected servicing workshops (including recovery station for R-22, charging unit, vacuum pumps, refrigerant weighted scales, vacuum gauges, leak detectors for HC, refillable cylinders, etc.) (UNIDO) (US \$244,800);
- (f) *National recycling, recovery and reclamation scheme:* develop guidelines and business model for reclamation facilities; establish two national RRR centres including refrigerant reclaim, laboratory equipment, consumables, transportation, installation and training (including inter alia recovery unit for R-22, reclaim station, refrigerant identifier, cylinders, leak detector, gas chromatograph, filter chiller unit, electric liquid transfer pump); acquire and deliver 150 service kits (including inter alia cylinders, manifolds and gauges, hoses, valves, recovery station for HCFCs, vacuum pump, charging unit, brazing equipment, safety equipment); establish two training centres at selected technical colleges and conduct eight awareness workshops and training for 200 RAC technicians on RRR (UNIDO) (US \$502,000);
- (g) *Promotion of alternative technologies:* organize study tours and webinars for 12 industries to other countries to exchange information on the development of low-GWP technologies; collaborate with RAC associations to disseminate information on new emerging technologies in RAC manufacturing and servicing sectors; organize consultation meetings on alternative technologies with relevant stakeholders (e.g. industry and government); hire a consultant to conduct research on safety and performance of low-GWP technologies (UNIDO) (US \$88,000);
- (h) *Awareness raising:* production and distribution of printed materials (e.g., newspaper advertisements, articles in journals) and through mass media (e.g., short films) in local language; celebration of the world refrigeration day; continuing annual Ozone2Climate roadshow and roundtable (UNEP) (US \$37,800); and

- (i) *Project Management Unit (PMU) (US \$25,000 for UNEP and US \$130,000 for UNIDO):* staff and consultants (US \$72,000), office rent (US \$25,000); travel meetings and workshops (US \$54,250); and other operational expenses (US \$3,750).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

49. The Secretariat reviewed stage III of the HPMP in light of stage II, 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 2022-2024 business plan of the Multilateral Fund.

Overarching strategy for stage III

50. The Government of Pakistan proposes to meet the 100 per cent reduction of its HCFC baseline consumption by 1 January 2030, and to maintain a maximum annual consumption of HCFC in the period of 2030 to 2040 consistent with Article 5, paragraph 8 ter(e)(i) of the Montreal Protocol.²³ In line with decision 86/51, the Government of Pakistan also agreed that, to allow for consideration of the final tranche of its HPMP, it would submit a detailed description of the regulatory and policy framework in place to implement measures to ensure that HCFC consumption was in compliance with paragraph 8 ter(e)(i) of Article 5 of the Montreal Protocol for the 2030-2040 period, and propose modifications to its Agreement with the Executive Committee covering the period beyond 2030.

51. UNIDO explained that Pakistan would ensure that consumption in 2030-2040 was strictly limited to those uses specified in paragraph 8 ter(e)(i) of Article 5 of the Protocol, including *inter alia* those identified in the adjustment to the Protocol in decision XXX/2, through national regulations and the strict implementation of the licensing and quota system. During the implementation of stage III of the HPMP, a review of the legal framework, including the scope of the environmental licence associated with the substances controlled by the Montreal Protocol, will be conducted to ensure that servicing tail consumption is properly addressed and controlled.

52. UNIDO also indicated that the strategy developed by the Government for the conversion of the remaining enterprises in the foam sector and the comprehensive approach to the servicing sector together with UNEP, will support the sustainable reduction of the consumption of HCFC achieved in stage I and stage II. UNIDO further indicated that the strategy for stage III was discussed and agreed upon with national stakeholders and aligns the HCFC phase-out with future HFC phase-down.

Regulations to support HCFC phase-out

53. To support the phase out of HCFCs, the Government of Pakistan is planning to develop and enact the following regulations as part of stage III of the HPMP: a ban on the reuse of disposable cylinders to prevent recharging of refrigerants; a ban on the use of HCFCs in all manufacturing sectors by 1 January 2026, which will be enacted after successful conversion of the remaining HCFC consuming enterprises under stage III of the HPMP; a ban on the import of all types of HCFC-based equipment to support the sustainability of those enterprises converting to low-GWP refrigerants; green procurement policy to promote energy efficiency and low GWP RAC equipment; and a ban on the import of HCFC-141b in pre-blended polyols prior to 1 January 2024.

²³ Article 5, paragraph 8 ter (e)(i) of the Montreal Protocol. Other applications where HCFCs can be used include the servicing of fire suppression and fire protection equipment existing on 1 January 2030; solvent applications in rocket engine manufacturing; and topical medical aerosol applications for the specialized treatment of burns.

HCFC consumption

54. With regard to the consumption of HCFC-141b in imported pre-blended polyols, the Secretariat noted that Pakistan had reported zero consumption of this substance for 2021 in its CP implementation report. Recalling decision 88/72(e),²⁴ the Secretariat asked UNIDO what mechanisms are in place to monitor the consumption of HCFC-141b in imported pre-blended polyols and for a clarification on the reported consumption for 2021. UNIDO explained that the mechanisms for monitoring the import of these substances are still under development; therefore, there may not be any available data on the import of these substances as of yet and thus the CP data reported was zero. Further, UNIDO reiterated that the amount reported in 2020 resulted from a survey done during the preparation of stage III, and that institutional capacity for monitoring will be enhanced with the technical support from UNEP as part of stage III. The Secretariat reminded UNIDO of the commitment of the Government of Pakistan to monitor this consumption and urged for the establishment of these monitoring mechanisms as soon as possible, to enable accurate reporting in the future.

Technical and cost issues related to the foam manufacturing sector

55. During the discussion of the proposed capital costs for the two individual PU foam insulation enterprises, the number and cost of gas sensors and the cost of ventilation for each enterprise was reduced by US \$28,000 for Cool Point Lahore, and by US \$5,000 for Islam ud Din. The eligible funding for Cool Point Lahore was further adjusted to reflect the actual consumption of the enterprise and the maximum eligible funding in line with decision 74/50(c)(iii).

56. With regard to the four spray foam enterprises, the Secretariat considered that the existing standard spray foam dispensers can operate with water-blown systems; therefore, the cost of these was reduced to US \$3,000 to enable retrofitting the foam heads, while testing and trials was increased to US \$7,000 for Symbol industries and to US \$8,300 for three other smaller enterprises. Technical assistance in the amount of US \$20,000 was also included to assist the sector in adopting emerging low-GWP alternatives.

57. The total agreed cost to phase-out of 74.33 mt (8.19 ODP tonnes) of HCFC-141b in the foam sector amounts to US \$356,083, plus support costs, with an overall cost effectiveness of US \$4.79/kg, as shown in Table 9.

Table 9: Final agreed cost for the conversion projects in the foam sector

Enterprise	HCFC average consumption 2019-2021		Cost (US \$)			C.E.
	mt	ODP tonnes	ICC	IOC	Total	(US \$/kg)
Individual foam enterprises						
Cool Point Lahore	9.83	1.08	107,993	0	107,993	10.99
Islam ud Din	16.7	1.84	160,000	0	160,000	9.58
Sub-total	26.53	2.92	267,993	0	267,993	-
Spray foam						
Symbol Industries, Lahore	18.9	2.08	20,900	0	20,900	1.11
Master Foam, Karachi	8.7	0.96	15,730	0	15,730	1.81
Master Foam, Lahore	5.87	0.65	15,730	0	15,730	2.68
Razi Sons, Karachi	14.33	1.58	15,730	0	15,730	1.10
Subtotal	47.8	5.27	68,090	0	68,090	-

²⁴ To note the commitment by the Government of Pakistan to monitor and to report in its country programme implementation report the use of HCFC-141b contained in pre-blended polyols and to establish monitoring mechanisms to ensure that the converted foam manufacturing enterprises were no longer using HCFC-141b, either pure or contained in pre-blended polyols.

Technical assistance	-	-	n/a	n/a	20,000	n/a
Total	74.33	8.19	336,083	0	356,083	4.79

Issues related to the refrigeration servicing sector

58. The Secretariat requested additional clarifications on the project components related to the servicing sector particularly those activities relating to the certification of technicians, the RRR scheme, and technical assistance for the AC manufacturing sector to assist in its transition to low-GWP alternatives.

59. Regarding the certification of technicians, UNEP, as the lead implementing agency for this activity, confirmed that the pilot certification programme developed to support the implementation of a National Vocational Qualification Framework, will be integrated into the national certification system of the country, and will be competency based and mandatory. This certification system is expected to be supported by the required regulatory framework to ensure its successful implementation. UNEP further described how the training of technicians in good servicing practices will support the certification programme, and how it will be integrated into the national technical and vocational education and training system and into the National Occupancy Competency Standards for refrigeration servicing technicians. As a start, and while the formal certification system is being finalized, UNEP indicated that funds will be provided to support technicians to receive their RPL certificate, around 1,000 technicians are expected to complete this certificate in the first three years of the implementation of stage III.

60. UNIDO also justified the need for additional equipment for technicians, and provided a list of equipment (e.g., recovery station for R-22, charging unit, vacuum pumps, refrigerant weighted scales, vacuum gauges, leak detectors for HC, refillable cylinders, etc.) including unit costs with the expectation that around 720 technicians will be provided with equipment costing US \$1,200/set in stage III.

61. Concerning the national RRR scheme, UNIDO explained that the inclusion of this component was based on the needs expressed by stakeholders and the Government of Pakistan during the preparation of stage III, and that the Government understands the need for these centres and the need to ensure their financial viability. Based on Pakistan's specific requirements, decentralized and medium-sized centres will be established. The Government will provide incentives for those service centres that would bid to become one of the RRR centres, and they would be provided equipment and tools to operate. It is expected that as the supply of HCFCs decrease as they are phased out, these centres would operate on their own, with little support from the Government. UNIDO provided a detailed cost breakdown of all activities, justification for the equipment being requested and the costs; noting that the funding requested for this component is US \$1,114,000.

62. UNIDO also provided detailed explanations regarding the activity to provide technical assistance to the AC manufacturing sector to ensure the uptake of low-GWP alternatives. UNIDO explained that this component is intended to assist those enterprises in the AC manufacturing sector which had converted from HCFC-22 to R-410A on their own because of available technology and market demand (which had resulted in a voluntary phase out of 24.58 ODP tonnes of HCFC-22), and those manufacturers which have a small remaining consumption of HCFCs but are not eligible for funding to facilitate their choice to convert to a low-GWP alternative. The specific activities under this technical assistance component included study tours, specialized training, a feasibility study on low-GWP alternatives available in Pakistan, provision of equipment to selected enterprises, coordination with these enterprises, providing equipment for installers, introducing a programme of minimum leaks for large end-users, and feasibility of disposal of unwanted ODS. The Secretariat expressed concern on some of the eligibility and viability of the activities included such as the feasibility of disposal and suggested that this be integrated into the RRR scheme. On the activity to provide equipment to installers, UNIDO explained the need to provide the installers with the necessary tools and equipment for the adoption of low-GWP and HC technologies, provided a list of the equipment and noted that these will be sent to the installers in the different cities in the country to ensure that they are equipped to use these alternatives when available. There are also interlinkages of this component with the

servicing sector training and capacity building activities that are designed to develop capacity in the country for the servicing and the manufacture of equipment/products using low-GWP alternatives.

63. Following the Secretariat's comments, UNIDO and UNEP both revised the activities for their components in the servicing sector, and adjusted the funding based on the observations provided. The total funding for the servicing sector was also increased to US \$4,973,664 to account for additional tonnage that was required to be phased out. This is still lower than the remaining eligible consumption for funding in Pakistan for stage III. The revised first funding tranche of stage III, at the amount of US \$1,895,633, will be implemented until December 2024. The adjusted project components and costs for stage III of the HPMP and the first tranche is shown in Table 10.

Table 10. Adjusted activities to be implemented for the servicing sector in stage III of the HPMP

Project component	Agency	Costs as originally submitted (US \$)		Agreed costs (US \$)		Difference (US \$)	
		Stage III	Tranche 1	Stage III	Tranche 1	Stage III	Tranche 1
Policy and enforcement capacity-building (legislation)	UNEP	302,600	118,950	362,600	130,950	60,000	12,000
	UNIDO	20,000	-	20,000	-	-	-
Enforcement and customs training	UNEP	253,266	55,000	260,864	55,000	7,598	-
	UNIDO	50,000	-	50,000	-	-	-
capacity building of RAC servicing technicians and workshops	UNEP	1,146,000	178,000	1,146,000	178,000	-	-
	UNIDO	1,008,000	244,800	1,008,000	244,800	-	-
National RRR scheme	UNIDO	1,114,000	502,000	1,114,000	502,000	-	-
Promotion of alternative technologies	UNIDO	371,000	88,000	841,000	236,000	470,000	148,000
Awareness raising and campaign	UNEP	171,200	37,800	171,200	37,800	-	-
Subtotal in servicing sector	-	4,436,066	1,224,550	4,973,664	1,384,550	537,598	160,000
PMU	UNIDO	475,000	130,000	475,000	130,000	-	-
	UNEP	100,000	25,000	100,000	25,000	-	-
Investment component	UNIDO	770,000	770,000	356,083	356,083	(413,917)	(413,917)
Totals	-	5,781,066	2,149,550	5,904,747	1,895,633	123,681	(253,917)

64. The revised and additional activities under stage III of the HPMP in the servicing sector included increasing the activities to aid in the review and development of policy and regulations to support HCFC phase-out such as 17 consultation meetings with stakeholders, public consultations and workshops and the preparation of a report on rationale and an impact assessment for approval of new regulations; further support through technical assistance for the customs authorities to strengthen risk profiling including identifying risk areas, risk indicators, and development of criteria for risk profiling; and regarding the promotion of alternative technologies new activities were added including: 12 specialized trainings for eight domestic AC and four commercial AC manufacturing enterprises on production, storage, transportation and installation of AC products based on low-GWP and HC technologies; the provision of portable leak detectors, gas charging and gas retrieval equipment²⁵ to installers of domestic and commercial AC manufacturers; and a feasibility study on low-GWP alternative technologies in Pakistan.

²⁵ Tools and equipment including *inter alia* recovery station for HCFC-22 and A2L refrigerants; HC charging equipment; service manifold, electronic gauges; refrigerant recovery cylinders (30 lb); leak detector HCFC-22 and

65. During the first tranche of stage III the activities that will be implemented include the implementation of conversion projects in the six foam enterprises; review of policies and regulations for supporting HPMP implementation; development of e-licensing system for HCFCs; development of regulations and design of institutional processes for mandatory qualification of RAC service technicians; conducting one training programme for customs department using international experts on implementation of HCFC regulations, monitoring and reporting; conducting four workshops for customs officers on HCFC controls and monitoring systems and one training programme for customs agents and importers on HCFC import procedures and data reporting requirements; conducting service sector training for 600 technicians; conducting one training programme for master trainers and two training programmes good practices for servicing large chillers/large commercial equipment; development of technical training materials for upgrading existing training and qualification procedures for good service practices; providing training equipment to about six training schools; procurement of 144 sets of tools/equipment for selected servicing workshops; development of guide for reclamation facilities and business model; operationalising two national recovery, recycling and reclamation centers, distribution of recovery and reuse equipment to about 150 service establishments; establishing two training centers in technical colleges for training on recovery, recycling and reclamation; organising study tours for identified industry representatives for information exchange on emerging low-GWP technologies and adoption of such technologies in RAC applications; providing technical assistance including feasibility study on adoption of low-GWP technologies; and awareness, coordination meetings and outreach programmes on adoption of low-GWP technologies and implementation of awareness programmes; and ozone to climate road shows and other information outreach programmes for promoting adoption of low-GWP alternatives to HCFCs.

Sustainability of the activities proposed under stage III

66. The Government of Pakistan will continue to strengthen their licensing and quota system for HCFCs; provide more training to customs and enforcement officers to ensure effective monitoring and control of HCFCs and implement conversion projects in the foam sector which will result in full phase-out of use of HCFC-141b (pure) in the country. The Government has also committed to implement a ban on use of HCFCs including imported pre-blended polyols using HCFC-141b, in manufacturing different products and to implement regulations to prohibit the import and use of HCFCs in all applications excluding HCFCs needed for service tail by 1 January 2030. This along with other measures planned under stage III to promote adoption of low-GWP alternatives in RAC applications would ensure sustainable achievement of HCFC phase-out targets. The Government is also planning to implement a range of capacity building activities in the service sector to ensure continued adoption of good service practices by the service agencies, capacity building in using low-GWP alternatives in a safe manner and progressively implement the certification for RAC technicians. The Government through their national and provincial regulatory set-up will continue to monitor implementation of activities and promote safe adoption of low-GWP alternatives. These measures would result in sustainable phase-out of HCFCs and adoption of low-GWP alternatives to HCFCs in different applications.

Cost of the HPMP stage III

67. The agreed costs for stage III of the HPMP for Pakistan, amounts to US \$5,904,747, to phase out 65.18 ODP tonnes as summarized in Table 11. With the approval of stage III of the HPMP, the Government commits to reducing HCFC consumption by 100 per cent of the baseline by 1 January 2030 noting that in stage II, the country had committed to reduce 77.66 ODP tonnes of HCFCs, which is equal to a 50 per cent reduction from its baseline.

Halogen based A2L refrigerants; HC leak detector; multimeter with clamp on amp measurement; brazing equipment and tips; N2 flushing equipment; electronic vacuum gauge.

Table 11. Final agreed costs for stage III of the HPMP in Pakistan

Activity	Substance	HCFC phase-out		Cost (US \$)	CE (US \$/kg)
		mt	ODP tonnes		
Conversion of six enterprises in the PU foam sector	HCFC-141b	74.33	8.19	356,083	4.79
Refrigeration servicing activities	HCFC-22	1,036.18	56.99	4,973,664	4.80
PMU	n/a	n/a	n/a	575,000	n/a
Total	n/a	1,109.84	65.18	5,904,747	5.32

68. The Secretariat discussed with UNIDO the proposed tranche distribution for stage III, noting the importance of ensuring a balanced distribution according to the needs of the country and the potential challenges posed by a prolonged pandemic. Subsequently, a revised tranche distribution was agreed, and Appendix 2-A of the Agreement was revised to show that the last tranche of stage III will be in 2030 instead of 2028 consistent with decision 62/17.

Impact on the climate

69. The estimated impact of the conversion projects in the foam sector is shown in Table 12 below.

Table 12. Impact on the climate of PU foam projects

Substance	GWP	Tonnes/year	CO ₂ - eq. (tonnes/year)
Before conversion			
HCFC-141b	725	74.33	53,889
After conversion			
Cyclopentane / water-blown	20	61.60	324
Impact			53,566

70. The proposed activities in the servicing sector, which include better containment of refrigerants through training and provision of equipment, will reduce the amount of HCFC-22 used for RAC servicing. Each kilogram of HCFC-22 not emitted due to better refrigeration practices results in savings of approximately 1.8 CO₂-equivalent tonnes. Although a calculation of the impact on the climate was not included in the HPMP, the activities planned by Pakistan, including its efforts to promote low-GWP alternatives, as well as refrigerant recovery and reuse, indicate that the implementation of the HPMP will reduce the emission of refrigerants into the atmosphere, resulting in climate benefits.

Co-financing

71. Co-financing of US \$45,000 will be provided by two beneficiary enterprises under stage III of the HPMP. In addition, the Government of Pakistan has committed to provide 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

72. UNIDO and UNEP are requesting US \$5,904,747, plus agency support costs, for the implementation of stage III of the HPMP for Pakistan. The total requested value of US \$3,992,628 including agency support costs for the period of 2022–2024, is US \$89,372 below the amount in the business plan.

Draft Agreement

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

RECOMMENDATION

74. The Executive Committee may wish to consider:
- (a) Approving, in principle, stage III of the HCFC phase-out management plan (HPMP) for Pakistan for the period from 2022 to 2030 for the complete phase-out of HCFC consumption, in the amount of US \$6,409,706 consisting of US \$3,864,083, plus agency support costs of US \$270,486 for UNIDO, and US \$2,040,664, plus agency support costs of US \$234,473 for UNEP, on the understanding that no more funding would be provided from the Multilateral Fund for the phase-out of HCFCs;
 - (b) Noting the commitment of the Government of Pakistan:
 - (i) To completely phase out HCFCs by 1 January 2030, and that HCFCs would not be imported after that date except for those allowed for a servicing tail between 2030 and 2040, where required, consistent with the provisions of the Montreal Protocol;
 - (ii) To ban the import of HCFC-141b in pre-blended polyols prior to 1 January 2024;
 - (iii) To ban the import of HCFC-based equipment by 1 January 2026;
 - (iv) To ban the use of HCFCs in manufacturing by 1 January 2026;
 - (c) Deducting the additional 24.58 ODP tonnes of HCFCs phased out during stage II and 56.99 ODP tonnes of HCFCs associated with stage III from the remaining HCFC consumption eligible for funding;
 - (d) Approving the draft Agreement between the Government of Pakistan and the Executive Committee for the reduction in consumption of HCFCs, in accordance with stage III of the HPMP, contained in Annex II to the present document;
 - (e) To allow for consideration of the final tranche of its HPMP, the Government of Pakistan should submit:
 - (i) A detailed description of the regulatory and policy framework in place to implement measures to ensure that HCFC consumption was in compliance with paragraph 8 ter(e)(i) of Article 5 of the Montreal Protocol for the 2030-2040 period;
 - (ii) If Pakistan were intending to have consumption during 2030-2040 period, in line with paragraph 8 ter(e)(i) of Article 5 of the Montreal Protocol, proposed modifications to its Agreement with the Executive Committee covering the period beyond 2030; and
 - (f) Approving the first tranche of stage III of the HPMP for Pakistan, and the corresponding tranche implementation plans for year-year, in the amount of US \$2,047,489 consisting of US \$1,468,883, plus agency support costs of US \$102,822 for UNIDO, and US \$426,750, plus agency support costs of US \$49,034 for UNEP.

Annex I

TEXT TO BE INCLUDED IN THE REVISED UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF PAKISTAN 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

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

16. This **revised** updated Agreement supersedes the Agreement reached between the Government of Pakistan and the Executive Committee at the **88th** meeting of the Executive Committee.

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2016	2017	2018	2019*	2020	2021	2022	2023	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	223.30	223.30	223.30	223.30	161.27	161.27	161.27	161.27	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	223.30	223.30	223.30	223.30	124.06	124.06	124.06	124.06	n/a
2.1	Lead IA (UNIDO) agreed funding (US\$)	2,350,200	0	1,979,852	619,938	0	0	161,340	0	5,111,330
2.2	Support costs for lead IA (US\$)	164,514	0	138,590	43,396	0	0	11,293	0	357,793
2.3	Cooperating IA (UNEP) agreed funding (US\$)	200,000	0	200,000	0	0	103,000	0	0	503,000
2.4	Support costs for Cooperating IA (US\$)	25,976	0	25,976	0	0	13,378	0	0	65,330
3.1	Total agreed funding (US\$)	2,550,200	0	2,179,852	619,938	0	103,000	161,340	0	5,614,330
3.2	Total support costs (US\$)	190,490	0	164,566	43,396	0	13,378	11,293	0	423,123
3.3	Total agreed costs (US\$)	2,740,690	0	2,344,418	663,334	0	116,378	172,633	0	6,037,453
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)									15.98
4.1.2	Phase-out of HCFC-22 to be achieved through previously approved projects (ODP tonnes)									7.40
4.1.3	Remaining eligible consumption of HCFC-22 (ODP tonnes)									81.57
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)									58.69
4.2.2	Phase-out of HCFC-141b to be achieved through previously approved projects (ODP tonnes)									71.70
4.2.3	Remaining eligible consumption of HCFC-141b (ODP tonnes)									8.11
4.3.1	Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes)									2.99
4.3.2	Phase-out of HCFC-142b to be achieved through previously approved projects (ODP tonnes)									0.00
4.3.3	Remaining eligible consumption of HCFC-142b (ODP tonnes)									0.00*

* The country had agreed to phase out all consumption of HCFC-142b with the funding provided for the extruded polystyrene foam project

**DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF PAKISTAN 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 Pakistan (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 zero ODP tonnes by 1 January 2030 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 row 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. UNIDO has agreed to be the lead implementing agency (the “Lead IA”) and UNEP 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

Substance	Annex	Group	Starting point for aggregate reductions in consumption (ODP tonnes)
HCFC-22	C	I	104.96
HCFC-141b	C	I	138.50
HCFC-142b	C	I	4.65
Total	C	I	248.11

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2022	2023	2024	2025	2026	2027-2028	2029	2030	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	161.27	161.27	161.27	80.63	80.63	80.63	80.63	0	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	124.05	124.05	124.05	80.63	80.63	80.63	80.63	0	n/a
2.1	Lead IA (UNIDO) agreed funding (US \$)	1,468,883	0	1,049,800	0	867,400	0	0	478,000	3,864,083
2.2	Support costs for Lead IA (US \$)	102,822	0	73,486	0	60,718	0	0	33,460	270,486
2.3	Cooperating IA (UNEP) agreed funding (US \$)	426,750	0	737,154	0	596,030	0	0	280,730	2,040,664
2.4	Support costs for Cooperating IA (US \$)	49,034	0	84,699	0	68,484	0	0	32,256	234,473
3.1	Total agreed funding (US \$)	1,895,633	0	1,786,954	0	1,463,430	0	0	758,730	5,904,747
3.2	Total support costs (US \$)	151,856	0	158,185	0	129,202	0	0	65,716	504,959
3.3	Total agreed costs (US \$)	2,047,489	0	1,945,139	0	1,592,632	0	0	824,446	6,409,706
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)									56.99
4.1.2	Phase-out of HCFC-22 to be achieved through previously approved projects (ODP tonnes)									47.96
4.1.3	Remaining eligible consumption of HCFC-22 (ODP tonnes)									0.00
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)									8.11
4.2.2	Phase-out of HCFC-141b to be achieved through previously approved projects (ODP tonnes)									130.39
4.2.3	Remaining eligible consumption of HCFC-141b (ODP tonnes)									0.00
4.3.1	Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes)									0.00
4.3.2	Phase-out of HCFC-142b to be achieved through previously approved projects (ODP tonnes)									2.99
4.3.3	Remaining eligible consumption of HCFC-142b (ODP tonnes)									0.00*

* The country agreed to phase out all consumption of HCFC-142b with the funding provided for the extruded polystyrene foam project

Date of completion of stage II as per stage II Agreement: 31 December 2024.

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 Ministry of Environment, Government of Pakistan, and the national ozone cell is responsible for the overall project controlling, coordination, assessment and monitoring.

2. Project management unit (PMU) officer will coordinate daily work of the project implementation and also to assist the enterprises, as well as Government and non-Government offices and organizations, to streamline their activities for smooth implementation of the projects. The PMU will help the Government of Pakistan with monitoring the progress on implementation, and reporting to the Executive Committee.

3. An independent and certified auditor will audit and verify the consumption of ODS reported by the Government through Article 7 data and country programme progress reports.

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 IAs, 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 the 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 IAs 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 \$181.18 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.