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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-first Meeting
Montreal, 5-9 December 2022
Item 9(d) of the provisional agenda[1]

PROJECT PROPOSALS: CHINA

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

Phase-out

HCFC phase-out management plan (stage II):	UNDP, UNEP, UNIDO, World Bank Austria, Germany, Italy, and Japan
• Extruded polystyrene foam sector plan – fifth tranche	UNIDO and Germany
• Solvent sector plan – fifth tranche	UNDP
• Refrigeration and air-conditioning servicing sector plan and the national enabling programme – fifth tranche	UNEP, Germany, and Japan

[1] UNEP/OzL.Pro/ExCom/91/1

Overarching strategy for stage II of the HPMP for China – Note by the Secretariat

Background

1. At the 76th and 77th meetings, the Executive Committee approved stage II of the HCFC phase-out management plan (HPMP) for China with associated sectors plans, and at the 79th meeting, the Agreement with the Government of China for the implementation of stage II of the HPMP was approved.

2. The HCFC consumption limits and targeted phase-out amounts associated with the six sector plans, as per the Agreement for stage II of the HPMP approved at the 79th Executive Committee meeting for the period 2016-2026, are shown in table 1.

Table 1. HCFC consumption limits and targeted phase-out by sector for stage II of the HPMP for China as per the Agreement approved at the 79th meeting (ODP tonnes)

Maximum allowable consumption							
Sector	**2016-2017**	**2018-2019**	**2020-2021**	**2022**	**2023-2024**	**2025**	**2026**
National	16,978.9	15,048.1	**11,772.0	n/a	n/a	n/a	n/a
XPS foam*	2,286.0	2,032.0	1,397.0	1,397.0	762.0	165.0	0.0
PU foam*	4,449.6	3,774.5	2,965.7	2,965.7	1,078.4	330.0	0.0
ICR*	2,162.5	2,042.4	**1,609.9	n/a	n/a	n/a	n/a
RAC*	3,697.7	2,876.0	**2,259.7	n/a	n/a	n/a	n/a
Solvent	455.2	395.4	321.2	321.2	148.3	55.0	0.0
Servicing*	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Targeted phase-out							
Sector	**2018**	**2020**	**2023**	**2025**	**2026**	**Total**	**Reduction from baseline (%)**
XPS foam*	254.0	635.0	635.0	597.0	165.0	2,286	100 in 2026
PU foam*	675.1	808.8	1,887.3	748.4	330.0	4,449.6	100 in 2026
ICR*	120.1	432.5	n/a	n/a	n/a	552.6	33 in 2020
RAC*	821.7	616.3	n/a	n/a	n/a	1,438	45 in 2020
Solvent	59.8	74.2	172.9	93.3	55.0	455.2	100 in 2026
Servicing*	n/a	734.0	n/a	n/a	n/a	734.0	n/a
Total	**1,930.7**	**3,300.8**	**2,695.2**	**1,438.7**	**550.0**	**9,915.4**	

* XPS = extruded polystyrene; PU = polyurethane; ICR = industrial and commercial refrigeration and air-conditioning; RAC = room air-conditioning manufacturing and heat pump water heaters; Servicing = refrigeration and air-conditioning servicing and the national enabling programme

** National maximum allowable consumption for 2020 only; for the 2021-2026 period, it was expected to be determined at the time of submission of stage III of the HPMP.

3. All second tranche requests except that for the polyurethane (PU) foam sector plan were approved at the 80th and 81st meetings. At the 82nd and 83rd meetings, consideration of all subsequent tranche requests was deferred to the 84th meeting. Details on the consideration of these funding tranches and decisions taken by the Executive Committee are included in Annex I to the present document.

4. At the 84th meeting, upon consideration of all stage II funding tranche requests for sector plans submitted by the relevant bilateral and implementing agencies on behalf of the Government of China, the Executive Committee decided, *inter alia* (decision 84/69):

(a) With regard to stage II of the HPMP for China approved at the 77th meeting:

(i) To request the relevant bilateral and implementing agencies, on behalf of the Government of China, to submit, at the 85th meeting, the 2020 funding tranche requests for the PU foam, extruded polystyrene (XPS) foam, industrial and commercial refrigeration and air-conditioning (ICR) and solvent sector plans of stage II of the HPMP;

(ii) To approve the revised Appendix 2-A, "The Targets and Funding," of the Agreement between the Government of China and the Executive Committee for stage II of the HPMP approved at the 79th meeting, as contained in Annex XXII to the report of the 84th meeting (document UNEP/OzL.Pro/ExCom/84/75), to reflect the revised maximum allowable total consumption of HCFCs in row 1.2 and the revised total funding in rows 3.1, 3.2 and 3.3 and the sector funding and support costs;

(iii) To request the Government of China, through the relevant bilateral and implementing agencies, to submit, no later than eight weeks prior to the 86th meeting, a revised plan of action that included related activities and information on the technology selected, and associated funding tranches to extend through 2026 stage II of the room air-conditioning manufacturing and heat pump water heaters (RAC), ICR, and refrigeration servicing sectors and enabling programme and, for the RAC and ICR sector plans, the maximum allowable sectoral consumption levels of HCFC as described in rows 1.3.1 and 1.3.4;

(iv) Also to request the Government of China, through the relevant bilateral and implementing agencies, to submit, at the 86th meeting, figures for potential revisions to Appendix 2-A for:

a. Row 1.2 specifying the maximum allowable total consumption of HCFCs in 2021-2026 to reflect the information under sub-paragraph (a)(iii) above;

b. The XPS foam, PU foam and solvent sector funding tranches for 2021-2026 in rows 2.2.1 to 2.2.4, 2.3.1 to 2.3.2 and 2.6.1 to 2.6.2, respectively; and

c. Tonnages associated with lines 4.1.1 to 4.6.3 to reflect the information in sub-paragraphs (a)(iii) above;

(v) Further to request the Government of China to update the information on necessary revisions to reflect the present decision for the approved XPS foam, PU foam and solvent sector plans;

(vi) To approve US $1,000,000, plus agency support costs of US $120,000 for UNEP, for the refrigeration and air-conditioning servicing sector and enabling programme, consistent with the revised Appendix 2-A referred to in sub-paragraph (a)(ii) above; and

(vii) To request UNDP as the lead implementing agency of the overall stage II of the HPMP, on behalf of the Government of China, to submit, at the 86th meeting, a draft revised Agreement between the Government of China and the Executive Committee reflecting only the relevant outcomes approved at the 84th meeting or those relevant to sub-paragraphs (a)(iii) and (a)(iv) above, and the revised plan of action for the RAC, ICR and refrigeration and air-conditioning servicing sectors and enabling programme also due for submission at the 86th meeting.

5. At the 85th meeting, the Executive Committee approved the third tranches of the XPS foam, ICR, and solvent sector plans, as well as the second tranche of the PU foam sector plan that had been submitted prior to adoption of decision 84/69, but had been deferred.

6. At the 86th meeting, the agencies submitted revised plans of action for all sector plans of stage II of the HPMP, addressing all elements of decision 84/69, including HCFC phase-out targets from 2021 to 2026, related activities, information on the technology selected, associated funding tranches, and a draft revised Agreement between the Government of China and the Executive Committee. Accordingly, the Executive Committee noted the revised plans of action for the sector plans of stage II of the HPMP and approved the revised Agreement between the Government and the Executive Committee (decision 86/34).

7. The revised HCFC consumption limits and targeted phase-out amounts associated with the six sector plans of stage II for the period 2016-2026 are shown in table 2.

Table 2. HCFC consumption limits and targeted phase-out by sector for stage II of the HPMP for China as per the Agreement approved at the 86th meeting (ODP tonnes)

Maximum allowable consumption							
Sector	**2016-2017**	**2018-2019**	**2020-2021**	**2022**	**2023-2024**	**2025**	**2026**
National	16,978.9	15,048.1	11,772.0	11,772.0	8,618.0	5,063.5	4,513.5
XPS foam	2,286.0	2,032.0	1,397.0	1,397.0	762.0	165.0	0.0
PU foam	4,449.6	3,774.5	2,965.7	2,965.7	1,078.4	330.0	0.0
ICR	2,162.5	2,042.4	1,609.9	1,609.9	1,369.6	780.9	780.9
RAC	3,697.7	2,876.0	2,259.7	2,259.7	1,614.1	1,232.6	1,232.6
Solvent	455.2	395.4	321.2	321.2	148.3	55.0	0.0
Servicing	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Targeted phase-out							
Sector	**2018**	**2020**	**2023**	**2025**	**2026**	**Total**	**Reduction from baseline by 2026 (%)**
XPS foam	254.0	635.0	635.0	597.0	165.0	2,286.0	100
PU foam	675.1	808.8	1,887.3	748.4	330.0	4,449.6	100
ICR	120.1	432.5	240.3	588.7	-	1,381.6	67.5
RAC	821.7	616.3	645.6	381.5	-	2,465.1	70
Solvent	59.8	74.2	172.9	93.3	55.0	455.2	100
Servicing	n/a	734.0	n/a	n/a	n/a	734.0	n/a
Total	**1,930.7**	**3,300.8**	**3,581.1**	**2,408.9**	**550.0**	**11,771.5**	**n/a**

Submission to the 91st meeting

8. Relevant bilateral and implementing agencies submitted requests for the fifth tranches of sector plans for XPS foam, solvent, and the refrigeration and air-conditioning servicing sector and the national enabling programme plan.[2] The summary of funding approved so far and requested at the present meeting is shown in table 3.

Table 3. Funding approved and requested for selected sectors under stage II of the HPMP (US $)

Sector plan (lead and cooperating agencies)	Funding approved	Funding requested
XPS foam (UNIDO, Germany)	31,405,298	2,000,000
PU foam	13,112,039	0
ICR (UNDP)	44,464,531	0
RAC (UNIDO, Austria, Italy)	36,062,981	0
Solvent (UNDP)	22,045,909	1,000,000
Servicing (UNEP, Germany, Japan)	9,329,132	2,000,000
Total	**156,419,890**	**5,000,000**

[2] The full name of the refrigeration and air-conditioning servicing sector and the national enabling programme is abbreviated to "refrigeration servicing sector" in the present document.

Status of ratification of the Kigali Amendment

9. On 17 June 2021, the Permanent Mission of the People's Republic of China to the United Nations deposited its letter of acceptance of the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (hereinafter referred to as the Kigali Amendment) with the Secretary-General of the United Nations. The Amendment entered into force on 15 September 2021. Following its acceptance, the Government of China revised its regulation with the purpose of including HFC in its jurisdictional scope and further enhancing liability for illegal activities involving controlled substances. The Ministry of Ecology and the Environment (MEE) has submitted the revised regulation to the domestic legislative procedures for approval. On 29 September 2021, the MEE, the National Development and Reform Commission, and the Ministry of Industry and Information Technology jointly issued the updated Catalogue of Controlled ODSs in China, including HFC in its scope.

HCFC consumption

10. The Government of China reported HCFC consumption for 2021 under Article 7 of the Montreal Protocol as shown in table 4.

Table 4. HCFC consumption in China from 2017 to 2021 (Article 7 data)

Year	2017	2018	2019	2020	2021	Starting point
Metric tonnes (mt)						
HCFC-22	172,970	178,658	*173,656	133,450	127,721	209,006
HCFC-123	990	991	958	868	946	507
HCFC-124	(6)	5	38	(23)	(32)	140
HCFC-133/133a	0	0	0	(17)	0	0
HCFC-141b	40,039	38,057	38,449	28,976	25,276	53,502
HCFC-142b	10,253	5,367	6,500	2,149	4,577	22,624
HCFC-225ca/cb	38	38	0.57	0	0	17
Total	**224,284**	**223,105**	**219,600**	**165,404**	**158,488**	**285,796**
ODP tonnes						
HCFC-22	9,513	9,826	9,551	7,340	7,025	11,495
HCFC-123	20	20	19	17	19	10
HCFC-124	(0.13)	0.12	0.83	(0.51)	(0.69)	3
HCFC-133/133a	0	0	0	(1.08)	0	0
HCFC-141b	4,404	4,186	4,229	3,187	2,780	5,885
HCFC-142b	666	349	422	140	297	1,471
HCFC-225ca/cb	1	1	0.017	0	0	1
Total	**14,604**	**14,382**	**14,223**	**10,683**	**10,121**	**18,865**

* Country programme data.

11. HCFC consumption in China continues to be dominated by three substances: HCFC-22, HCFC-141b and HCFC-142b, which collectively account for 99.8 per cent of the country's consumption (in ODP tonnes). Overall HCFC consumption in 2021 was 5.3 per cent lower (in ODP tonnes) than in 2020 and continued to be in compliance with the 35 per cent reduction target established by the Montreal Protocol and the maximum allowable consumption in the Agreement between the Government and the Executive Committee. The reductions in HCFC consumption per sector are discussed in the detailed stand-alone progress reports on the implementation of the XPS foam, solvent, and refrigeration servicing sector plans, attached to this Note by the Secretariat.

12. The Government has also reported country programme (CP) data for 2021. Table 5 presents HCFC consumption per sector in 2021, confirming compliance with the manufacturing sector consumption limits set out in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4 and 1.3.5 of Appendix 2-A of the Agreement between the Government of China and the Executive Committee for stage II of the HPMP.

Table 5. HCFC consumption per sector in China in 2021 (CP data) (ODP tonnes)

Substance	XPS foam	PU foam	ICR*	RAC*	Solvent	Servicing
HCFC-22	1,155.0	0.0	1,485.0	1,540.0	0.0	2,844.6
HCFC-141b	0.0	2,505.3	0.0	0.0	275.0	0.0
HCFC-142b	162.5	0.0	4.2	0.0	0.0	130.8
HCFC-123	0.0	0.0	10.8	0.0	0.0	8.1
HCFC-124	0.0	0.0	0.0	0.0	0.0	(0.7)
Total	**1,317.5**	**2,505.3**	**1,500.0**	**1,540.0**	**275.0**	**2,982.8**
Maximum allowable consumption	1,397.0	2,965.7	1,609.9	2,259.7	321.2	n/a

* Consumption breakdown between the ICR and RAC sectors is submitted by the implementing agencies.

13. The Government of China continues to monitor HCFC consumption in each sector. Every year, the Foreign Environmental Cooperation Centre (FECO) collects data from multiple sources, including beneficiary enterprises, verification reports of the production sector, the licensing system, and the industrial associations. The data is cross-verified with actual consumption by enterprises only for some sectors (such as RAC, with limited enterprises) and substances (HCFC-22). In sectors with many small and medium-sized enterprises (SMEs) (i.e., XPS foam, PU foam, ICR, and servicing), HCFCs are monitored through the national licensing and quota system for imports, exports, production, and consumption. Domestic production quotas regulate HCFC sales in the local market and subsequent consumption by SMEs. Quotas are also issued to enterprises in each sector with annual consumption of over 100 mt HCFCs.

14. In cooperation with the local Ecology and Environment Bureaus (EEBs), FECO acts to strengthen policies that support reductions in HCFC consumption, including a ban on new HCFC-based manufacturing facilities.

Verification of consumption of HCFCs in China

15. The World Bank commissioned an independent verification of 2021 HCFC production and consumption in China which confirmed that the consumption of HCFCs in 2021 was within the limits established by the Agreement for the consumption sector.[3] Based on the verification report, the country was making minor revisions to the data submitted under Article 7 of the Montreal Protocol and the CP data report.

Verification of the manufacturing sector conversions

16. UNDP and UNIDO submitted technical reports to verify conversions completed in the XPS foam and solvent sectors in 2021, in line with paragraph 5(c) of the Agreement. The verification reports confirmed the completion of these projects, and the amounts of HCFC phased out, and provided reassurance on the commitment from converted enterprises to not revert to the use of HCFCs. An overview of verifications by sector is shown in table 6.

Table 6. Verified phase-out of HCFCs by sector achieved in 2021 through funded conversions

Sector	Number of lines and enterprises	Verified phase-out of HCFCs	
		mt	%
XPS foam	6 lines in 4 enterprises	1,514.5	100
Solvent	68 lines in 3 enterprises	96.1	51

[3] The verification was conducted virtually. The World Bank will submit to the last meeting of 2023 an addendum to the 2021 verification reports of the HCFC production sector in China to provide additional information based on in-person visits to the production facilities

Overview of progress

17. The main achievements in the implementation of stage II of the HPMP include:

(a) Establishment and continuous enforcement of the licensing and quota system to control consumption in all manufacturing sectors, including the application of quota permits to enterprises consuming more than 100 mt of HCFCs per year, resulting in compliance with relevant consumption limits throughout the period of implementation;

(b) *XPS foam sector*: The contract between FECO and UNIDO was signed in September 2017. Ten enterprises have already completed their conversions to CO_2 with other low-GWP co-blowing agents, phasing out 4,297 mt (242.61 ODP tonnes) of HCFCs. Eleven additional enterprises with a combined HCFC consumption of 4,035 mt (223.71 ODP tonnes) have been identified, verified, and found eligible for funding. All manufacturers have signed sub-contracts for conversion to CO_2-based technology;

(c) *PU foam sector*: The contract between FECO and the World Bank was signed in January 2019. The first 11 participating enterprises completed conversions to water-blown, hydrofluoroolefin, or cyclopentane foam-blowing technology, collectively phasing out 1,189 mt (130.79 ODP tonnes) of HCFC-141b. Twelve additional enterprises with joint consumption of 1,068 mt (117.48 ODP tonnes) have started their conversions. Technical assistance activities and implementation through systems houses to reach smaller HCFC-141b consumers will be supported by future funding tranches;

(d) *ICR sector:* The work plan for the implementation of the fourth tranche was signed by FECO and UNDP in April 2022.Out of the 18 manufacturing lines undergoing conversion since 2016, 14 have completed project acceptance so far, phasing out 2,009.22 mt (110.51 ODP tonnes) of HCFC-22, and two out of the 14 converted lines were verified and passed project acceptance in 2022. Baseline information for two additional enterprises with four HCFC manufacturing lines has already been verified and procurement contracts for these enterprises are under way. Nine additional ICR enterprises with 12 manufacturing lines submitted applications for conversions and are awaiting the verification of their baseline information by FECO and the China Refrigeration and Air-Conditioning Industry Association (CRAA). In September 2022, FECO signed contracts for technical assistance with the CRAA;

(e) *RAC manufacturing sector:* The second tranche agreement between FECO and UNIDO was signed in June 2019. Five RAC-manufacturing and four compressor-manufacturing enterprises signed agreements to convert their manufacturing lines to R-290 to phase out 2,221.12 mt (122.16 ODP tonnes) of HCFC-22. Of these, four RAC manufacturing enterprises and three compressor manufacturers completed conversions, and equipment for the remaining two enterprises has been procured and delivered, with installation and trials in progress. Contracts have been signed with 13 research institutes to develop research and development projects for the introduction of R-290 technology; most of them have completed their mid-term reports and shared findings with RAC enterprises and other stakeholders at a review meeting held by FECO in July 2022;

(f) *Solvent sector*: FECO signed two batches of contracts with a total of 49 enterprises. Conversions in the first 24 enterprises covered 514 production lines with a combined consumption of 1,176.29 mt (129.38 ODP tonnes) of HCFC-141b. Nineteen of these enterprises completed conversions and received national acceptance for phasing out 966.1 mt (106.2 ODP tonnes) of HCFC-141b, four additional conversions are expected to be completed and receive national acceptance by December 2022, and one enterprise had

withdrawn from the project due to closure. In July 2022, the second batch of contracts with a total value of US $2,000,907 was signed with 25 eligible enterprises, mostly SMEs in the medical devices sub-sector (18) and the metal and electronics sub-sector (7), covering 347 production lines with a verified consumption of 372.2 mt (40.9 ODP tonnes) of HCFC-141b; and

(g) *Refrigeration servicing sector*: The agreement between FECO and UNEP for the fourth tranche was signed in April 2022. Two new codes for good servicing practices were published and one additional code was drafted; the study and survey reports on ODS recovery, reuse and destruction were completed; and three other studies were completed on ODSs with regard to the monitoring of atmospheric concentrations, testing standards for industrial products, and strengthening the environmental impact assessment and discharge standards. The ODS Import and Export Management Office continued to review applications submitted by enterprises and issue permits and licenses, while customs and enforcement officers, Government departments, and import/export enterprises received related training. Ten centres provided training in good servicing practices to 6,113 trainers and technicians; over 20,000 technicians were trained through the manufacturers' after-sales programme; and 122 trainers and technicians received training specific to the cold chain sector. A contract was awarded, and initial data was collected for a demonstration project of CO_2 trans-critical system applications in the supermarket sector. Agreements with two new pilot cities, Tianjin and Zhejiang, were signed and work plans are currently developed for activities to promote the use of alternative technologies in the sector, while parallel activities in the other three pilot cities are expected to be completed by the end of 2022, when final reports and policy suggestions will be submitted to FECO/MEE. Stakeholders attended the HPMP coordination meeting and a workshop on HCFC-22 phase-out in the sector; International Ozone Day was celebrated with related activities; the Ozone2Climate Technologies roadshow and roundtable hosted over 1,000 participants; and a national Ozone2Climate art contest was launched.

Disbursement of funds

18. As of October 2022, of the US $156,419,890 approved for all tranches of sector plans under stage II of the HPMP in China, US $115,251,687 (74 per cent) had been disbursed from implementing agencies to FECO, and FECO disbursed US $98,881,571 (63 per cent) to beneficiaries,[4] as shown in table 7.

Table 7. Disbursements by sector under stage II of the HPMP (as of October 2022)

Funding by sector / Implementing agencies (IAs)		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Total
XPS foam (UNIDO/Germany)						
Approved		7,514,867	9,000,000	9,890,431	5,000,000	31,405,298
Disbursed from IAs to FECO	Amount (US $)	7,514,867	9,000,000	9,890,431	1,338,662	27,743,960
	Ratio (%)	100	100	100	27	88
Disbursed by FECO	Amount (US $)	7,377,852	9,000,000	9,890,431	1,168,899	27,437,182
	Ratio (%)	98	100	100	23	87
PU foam (World Bank)						
Approved		7,045,027	2,067,012	4,000,000	n/a	13,112,039
Disbursed from IA to FECO	Amount (US $)	7,045,027	2,067,012	2,000,000	n/a	11,112,039
	Ratio (%)	100	100	50	n/a	85

[4] The milestones for disbursing funding for the XPS foam, PU foam, ICR, RAC and solvent sector plans include: signing the conversion contract (30 per cent payment); completion of design and procurement contract (20 per cent payment); completion of prototype manufacture, conversion of lines and performance test (30 per cent payment); and trial production, training, and equipment disposal upon project acceptance (20 per cent payment).

Funding by sector / Implementing agencies (IAs)		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Total
Disbursed by FECO	Amount (US $)	7,045,027	1,298,662	1,560,011	n/a	9,903,700
	Ratio (%)	100	63	39	n/a	76
ICR (UNDP)						
Approved		13,368,756	20,000,000	2,095,775	9,000,000	44,464,531
Disbursed from IA to FECO	Amount (US $)	*13,265,048	*19,902,532	1,597,036	4,480,000	39,244,616
	Ratio (%)	99	99.5	76	50	88
Disbursed by FECO	Amount (US $)	12,394,660	14,003,770	791,687	366,231	27,556,348
	Ratio (%)	93	70	38	4	62
RAC (UNIDO/Austria/Italy)						
Approved		15,562,981	16,000,000	4,500,000	n/a	36,062,981
Disbursed from IAs to FECO	Amount (US $)	4,371,327	4,740,000	**0	n/a	9,111,327
	Ratio (%)	28	30	0	n/a	25
Disbursed by FECO	Amount (US $)	4,371,327	***4,990,980	0	n/a	9,362,307
	Ratio (%)	28	31	0	n/a	26
Solvent (UNDP)						
Approved		2,821,937	3,777,190	12,946,782	2,500,000	22,045,909
Disbursed from IA to FECO	Amount (US $)	2,796,937	3,741,089	12,299,443	1,232,000	20,069,469
	Ratio (%)	99	99	95	49	91
Disbursed by FECO	Amount (US $)	2,796,937	****3,742,190	11,079,967	751,620	18,370,714
	Ratio (%)	99	99	86	30	83
Servicing (UNEP/Germany/Japan)						
Approved		3,679,132	2,650,000	1,000,000	2,000,000	9,329,132
Disbursed from IAs to FECO*****	Amount (US $)	3,654,276	2,640,000	925,000	751,000	7,970,276
	Ratio (%)	99	99.6	93	38	85
Disbursed by FECO	Amount (US $)	3,331,405	2,020,029	484,051	415,835	6,251,320
	Ratio (%)	91	76	48	21	67
TOTAL funding for all sectors:						
Approved by the ExCom		49,992,700	53,494,202	34,432,988	18,500,000	156,419,890
Disbursed from IAs to FECO	Amount (US $)	38,647,482	42,090,633	26,711,910	7,801,662	115,251,687
	Ratio (%)	77	79	78	42	74
Disbursed by FECO	Amount (US $)	37,317,208	35,055,631	23,806,147	2,702,585	98,881,571
	Ratio (%)	75	66	69	15	63

* Interest in the amount of US $103,708 for 2016 and US $97,468 for 2017 has been deducted.

** UNIDO expects to disburse approximately US $1,200,000 to FECO by 31 December 2022.

*** Higher disbursement than that of UNIDO given disbursements by FECO with its own resources.

**** Consisting of US $3,741,089 plus US $1,101 of interest accrued up to December 2016 and offset from the transfer for the second tranche, according to decision 80/17(b).

***** Reference for disbursement in the refrigeration servicing sector.

19. At the time of submission of the tranche requests (12 weeks prior to the 91st meeting), the rate of fund disbursement from FECO to beneficiaries was above 20 per cent in the XPS foam, solvent, and refrigeration servicing sectors.

Implementation under COVID-19

20. The COVID-19 pandemic continued to affect the implementation of stage II of the HPMP, as in the case of intermittent travel restrictions impeding completion of activities such as on-site visits, verifications, or in-person meetings. The Government of China and the implementing agencies have continued to implement activities in a flexible way, including virtual verifications, online meetings and

communications when necessary, achieving projects goals despite the limitations brought on by the pandemic.

Financial report of the project management unit (PMU) under the HPMP and the HPPMP

21. In line with decision 81/46(b),[5] UNDP submitted the PMU expenditures for stage I and stage II of the HPMP as of December 2021, as presented in Annex II to the present document.

Disbursement of funds and interest accrued under stage I and stage II

22. In line with decision 69/24, information on interest accrued at the end of 2021 from funds previously transferred for the implementation of sector plans was provided through an audit report of disbursements made in all sectors,[6] as shown in table 8. The report indicates that "the financial statement of project grant and disbursement of the HPMP (stages I and II) complies with the rules of the Montreal Protocol on ODS and the Chinese Institution Accounting Standard. The statement of project grant and expenditure has been fairly and justly presented in all material respects from 1 January to 31 December 2021 by FECO."

Table 8. Interest accrued under stages I and II of the HPMP in China as of 31 December 2021 (US $)

Sector plan and implementing agencies	Stage I	Stage II	Total
XPS foam (UNIDO/Germany)	-	1,471	1,471
PU foam (World Bank)	-	182	182
ICR (UNDP)	9,005	26,501	35,506
RAC (UNIDO/Austria/Italy)	485	8,668	9,153
Solvent (UNDP)	-	12,387	12,387
Servicing (UNEP/Germany/Japan)	-	5,746	5,746
Total for all sector plans	**9,490**	**54,956**	**64,446**

Tranche progress reports and funding requests

23. Detailed stand-alone progress reports on the implementation of the XPS foam, solvent, and refrigeration servicing sector plans, and the associated fifth tranche requests for funding, are attached to the Note by the Secretariat. Each report provides a progress report on the implementation of the ongoing tranche, the level of fund disbursement, an implementation plan for the next tranche, comments by the Fund Secretariat, and the recommendation.

24. The Secretariat notes that the Government of China has been in compliance[7] with the HCFC consumption targets established for each sector, that substantive progress and fund disbursement have been achieved in all sectors, and that all technical and cost issues have been resolved.

Secretariat's recommendation

25. The Executive Committee may wish, with regard to the interest accrued by the Government of China, up to 31 December 2021, on funds previously transferred for the implementation of sector plans under stages I and II of the HCFC phase-out management plan (HPMP), as per decisions 69/24 and 77/49(b)(iii), to request the Treasurer:

[5] To request UNDP, in cooperation with the sector lead implementing agencies, to use the financial reporting format for the PMU expenditures contained in Annex X to the present report in their annual tranche progress reports, starting in 2019

[6] Submitted by UNDP on 7 September 2022.

[7] Based on the verified consumption in 2021.

(a) To offset future transfers to UNIDO by US $1,471, representing interest accrued from funds previously transferred for the implementation of the extruded polystyrene foam sector plan under stage II of the HPMP;

(b) To offset future transfers to the World Bank by US $182, representing interest accrued from funds previously transferred for the implementation of the polyurethane foam sector plan under stage II of the HPMP;

(c) To offset future transfers to UNDP by US $35,506, representing interest accrued from funds previously transferred for the implementation of the industrial and commercial refrigeration sector plan under stages I and II of the HPMP;

(d) To offset future transfers to UNIDO by US $9,153, representing interest accrued from funds previously transferred for the implementation of the room air-conditioning sector plan under stages I and II of the HPMP;

(e) To offset future transfers to UNDP by US $12,387, representing interest accrued from funds previously transferred for the implementation of the solvent sector plan under stage II of the HPMP; and

(f) To offset future transfers to UNEP by US $5,746, representing interest accrued from funds previously transferred for the implementation of the refrigeration and air-conditioning servicing sector plan and the national enabling programme under stage II of the HPMP.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS
China

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) XPS foam sector	Germany and UNIDO (lead)	77th	100% in 2026

(II) LATEST ARTICLE 7 DATA (Annex C Group l)	Year: 2021	10,120.64 ODP tonnes

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2021
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,155.00	3,025.00	2,844.63		7,024.63
HCFC-123			10.80	8.13		18.93
HCFC-124				(0.70)		(0.70)
HCFC-141b		2,505.31			275.00	2,780.31
HCFC-142b		162.50	4.23	130.75		297.48

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	19,269.00	Starting point for sustained aggregate reductions:	18,865.44
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	12,161.02	Remaining:	6,704.42

(V) ENDORSED BUSINESS PLAN		2022	2023	2024	Total
UNIDO	ODS phase-out (ODP tonnes)	101.74	152.60	50.87	305.21
	Funding (US $)	2,140,000	3,210,000	1,070,000	6,420,000

(VI) PROJECT DATA			2016	2017	2018 2019	2020*	2021	2022	2023	2024	2025	2026	Total
Montreal Protocol consumption limits (ODP tonnes)			17,342.1	17,342.1	17,342.1	12,524.9	12,524.9	12,524.9	12,524.9	12,524.9	6,262.4	6,262.4	n/a
Maximum allowable consumption (ODP tonnes)			2,286.0	2,286.0	2,032.0	1,397.0	1,397.0	1,397.0	762.0	762.0	165.0	0.0	n/a
Funding agreed in principle (US $) **	UNIDO	Project costs	7,514,867	8,732,614	0	9,890,431	4,400,000	2,000,000	3,000,000	1,000,000	4,000,000	3,534,654	44,072,566
		Support costs	526,041	567,620	0	692,330	308,000	140,000	210,000	70,000	280,000	247,426	3,085,080
	Germany	Project costs	-	267,386	0	0	600,000	0	0	0	0	0	867,386
		Support costs	-	31,877	0	0	73,535	0	0	0	0	0	105,412
Funds approved by ExCom (US $)		Project costs	7,514,867	9,000,000	0	9,890,431	5,000,000	0	0	0	0	0	31,405,298
		Support costs	526,041	599,497	0	692,330	381,535	0	0	0	0	0	2,199,403
Total funds recommended for approval at this meeting (US $)		Project costs						2,000,000					2,000,000
		Support costs						140,000					140,000

* The third (2018) tranche was submitted to the 82nd, 83rd, and 84th meetings and deferred for consideration at the 85th meeting (decisions 82/71(b), 83/55 and 84/69(a)).
** Total adjusted value of stage II of the HPMP for the XPS foam sector plan and the funding level of tranches between 2020 and 2026 were approved at the 86th meeting (decision 86/34).

Secretariat's recommendation:	Individual consideration

PROJECT DESCRIPTION

26. On behalf of the Government of China, UNIDO as the lead implementing agency has submitted a request for funding for the fifth tranche of the extruded polystyrene (XPS) foam sector plan of stage II of the HCFC phase-out management plan (HPMP), at the amount of US $2,000,000, plus agency support costs of US $140,000 for UNIDO only.[8] The submission includes a progress report on the implementation of the fourth tranche of the XPS foam sector plan, the tranche implementation plan for 2023, and verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee.

27. This submission is based on the revised plan of action for the XPS foam sector for the period 2021-2026 at the total amount of US $18,534,654, plus agency support costs, approved by the Executive Committee at the 86th meeting. The value of the adjusted total funding approved in principle for stage II of the XPS foam sector plan is US $44,939,952, plus agency support costs (decision 86/34).

28. Stage II of the XPS foam sector plan comprises four groups of activities: policy and regulatory interventions; an investment component to assist enterprises with conversions; technical assistance to strengthen the technical capacity of the sector and to promote the adoption of low-global-warming-potential (GWP) alternatives; and project management. The original plan proposed to assist 124 enterprises in phasing out 1,265 ODP tonnes of HCFCs, while the remaining consumption of 1,021 ODP tonnes would be phased out by non-assisted enterprises; the revised plan approved in 2020 set out to directly assist 21 enterprises (10 ongoing projects from previous tranches and 11 projects proposed in the revised plan of action) to phase out 466.32 ODP tonnes, with the remaining consumption of 930.68 ODP tonnes (based on the 2020 target of 1,397 ODP tonnes) to be phased out by non-assisted enterprises.

Progress report on the implementation of the fourth tranche of stage II of the XPS foam sector plan

Investment activities

29. The contract between the Foreign Environmental Cooperation Centre (FECO) and UNIDO for the implementation of stage II of the XPS foam sector plan was signed in September 2017. Ten enterprises have already completed their conversions to CO_2 with other low-GWP co-blowing agents,[9] phasing out 4,297 metric tonnes (mt) or 242.61 ODP tonnes of HCFCs.

30. Eleven additional enterprises with a consumption of 4,035 mt (223.71 ODP tonnes) of HCFCs have been identified, verified, and found eligible for funding. All these manufacturers have signed conversion sub-contracts, three are currently assisted with funds from the fourth tranche, and the remaining eight will be assisted with funds from the fifth and subsequent tranches. The progress of conversion activities at these enterprises is summarized in table 1.

Table 1. Status of progress at XPS foam enterprises selected for conversion

Status of implementation	Number of enterprises	HCFC consumption in 2016*		Value of contracts (US $)
		mt	ODP tonnes**	
Project completed (passed project acceptance)	10	4,296.80	242.61	24,263,130
Conversion sub-contract signed (implementation with funds from the fourth tranche)	3	913.48	50.32	3,956,026

[8] As per the letter of 13 September 2022 from the Ministry of Ecology and Environment of China to UNIDO.

[9] Alcohol for XPS board thickness below 60 mm; CO_2 and small amounts of HFC-152a (GWP of 124) for XPS board thickness above 60 mm.

Status of implementation	Number of enterprises	HCFC consumption in 2016*		Value of contracts (US $)
		mt	ODP tonnes**	
Conversion sub-contract signed (to be implemented with funds from the fifth and subsequent tranches)	8	3,122.01	173.39	12,171,931
Total	**21**	**8,332.29**	**466.32**	**40,391,087**

* 2016 is the year used as reference for HCFC consumption for stage II of the HPMP.

** ODP tonnes are calculated by the actual amount of HCFC-22 and HCFC-142b used by each enterprise.

Verification of converted manufacturing lines

31. In accordance with paragraph 5(c)[10] of the Agreement, UNIDO commissioned the verification of six manufacturing lines in four of the XPS foam enterprises that had converted to CO_2 with associated phase-out of 1,514.51 mt (85.87 ODP tonnes) of HCFCs. This represents 100 per cent of the enterprises that completed their conversion in 2021 and 35 per cent of the amount of HCFCs phased out so far under stage II. The verification reports confirmed *inter alia* that the enterprises had permanently ceased their use of HCFCs in XPS foam production and started manufacturing with CO_2-based technology in line with the relevant national product standards. The verifications also confirmed that the allocation of funds was transparent and within the cost-effectiveness thresholds, and that the replaced baseline equipment was destroyed. The manufacturers' incremental operational costs (IOCs) of production with CO_2-based technology have increased *inter alia* due to their use of virgin rather than recycled material, the need to comply with an upgraded flame resistance standard, and the replacement of the flame retardant.[11] The enterprises co-financed capital and operational costs.

Technical assistance activities

32. Technical assistance activities implemented in 2021-2022 included: technical support provided by the implementation support agency (ISA) to FECO and the 11 enterprises in their day-to-day operations, conversion processes, on-site baseline verifications and promotion of alternative technologies; preparation of a manufacturing safety brochure for XPS foam enterprises; one training workshop to support the conversions; and preparation of terms of reference for the implementation of a plan to optimize and evaluate equipment and technologies. UNIDO, the Government of Germany and FECO coordinated on a regular basis to monitor progress in the implementation of the sector plan and to determine follow-up actions.

Level of fund disbursement

33. As of September 2022, of the US $31,405,298 approved so far, US $27,437,182 (87 per cent) had been disbursed by FECO to beneficiaries, as shown in table 2. The balance of US $3,968,116 will be disbursed in 2023-2024.

Table 2. Status of disbursement for stage II of the XPS foam sector plan (US $)

Description		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Total
Funds approved	UNIDO	7,514,867	8,732,614	9,890,431	4,400,000	30,537,912
	Germany	0	267,386	0	600,000	867,386
	Total	**7,514,867**	**9,000,000**	**9,890,431**	**5,000,000**	**31,405,298**
Disbursement from	UNIDO	7,514,867	8,732,614	9,890,431	1,320,000	27,457,912

[10] The country has to submit a verification report of a random sample of at least 5 per cent of the manufacturing lines which had completed their conversion in the year to be verified, on the understanding that the total aggregated HCFC consumption of the random sample of the manufacturing lines represents at least 10 per cent of the sector consumption phased out in that year.

[11] Hexabromocyclododecane (HBCD) production and use was phased out following the listing in Annex A to the Stockholm Convention. Tetra-bromo-bis-phenol A-bis (2,3 di-bromo-propyl ether) (BDDP) (CAS 21850-44-2) is used as a replacement.

Description		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Total
implementing agencies to FECO	Germany*	0	267,386	0	18,662	286,048
	Total	**7,514,867**	**9,000,000**	**9,890,431**	**1,338,662**	**27,743,960**
	Ratio (%)	100	100	100	27	88
Disbursement from FECO to beneficiaries	**Total**	**7,377,852**	**9,000,000**	**9,890,431**	**1,168,899**	**27,437,182**
	Ratio (%)	98	100	100	23	87
Fund balance		137,015	0	0	3,831,101	3,968,116

* According to the implementation requirements, funding from the Government of Germany is directly disbursed to beneficiaries and goods/service providers.

Implementation plan for the fifth tranche of stage II of the XPS foam sector plan

34. FECO will continue enforcing quota permits for XPS foam enterprises consuming more than 100 mt of HCFCs per year while supervising conversions to CO_2-based technology at the additional 11 enterprises and providing them with technical and safety assistance. The ISA will provide support to the enterprises in the form of day-to-day operational management, supervision, training, guidance in the implementation of activities, and facilitating the safety aspect of conversions, including verification. Previously initiated technical assistance activities will extend to the fifth tranche, including *inter alia* training on transition to low-GWP technologies offered to XPS foam enterprises, equipment suppliers, experts, local ecology and environment bureaus (EEBs), firefighting bureaus, research institutes, and relevant agencies; revision of a product standard ("XPS foam for foundation insulation prior to floor heating"); optimization of CO_2-based technology through research on the use of heat gluing technology to produce XPS foam thicker than 60 mm; and public awareness activities. Table 3 presents the budget for activities to be carried out during the fifth tranche.

Table 3. Budget for the fifth tranche of stage II of the XPS foam sector plan in China (UNIDO)

Item	Budget (US $)
Conversion of XPS foam enterprises to CO_2-based technology	1,735,700
Technical assistance including ISA's support, supervision, and verification	154,300
Project management, including:	
- Project and support staff	65,010
- Operating costs: daily operating expenses, domestic travel, meetings, office facilities and equipment	41,030
- Consulting services	3,960
Project monitoring Sub-total	110,000
Total	**2,000,000**

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

35. Consumption of HCFCs in the XPS foam manufacturing sector in 2021 was 23,500 mt (1,318 ODP tonnes), which is below the 1,397 ODP tonnes allowable consumption in the Agreement between the Government of China and the Executive Committee, as shown in table 4.

Table 4. Consumption of HCFCs in the XPS foam sector

Description		2017	2018	2019	2020	2021
Consumption*	mt	38,500	34,000	33,500	24,500	23,500
	ODP tonnes	2,213	1,920	1,898	1,363	1,318
Maximum allowable consumption**	mt	39,755	35,339	35,339	24,296	24,296
	ODP tonnes	2,286	2,032	2,032	1,397	1,397

Description		2017	2018	2019	2020	2021
Phase-out targets	mt		4,416		11,043	
	ODP tonnes	n/a	254	n/a	635	n/a

* 2014-2021: As per the country programme implementation report.
** As per the Agreement approved at the 86th meeting for stage II from 2016 to 2021.

36. Reductions in consumption since 2017 have been achieved through conversions of XPS foam enterprises; strict implementation of production quotas, domestic sales quotas, and consumption quotas required for manufacturing enterprises consuming over 100 mt of HCFCs; mandatory registration of enterprises; and the EEBs' involvement in supervision and monitoring. Through the technical assistance component, the Government continues to provide technical support, training, and supervision to strengthen the industry's technical capacity to adopt low-GWP alternatives and ensure that further reductions are achieved and sustained.

Status of progress

Market uptake of CO_2-based technology in the XPS foam sector in China

37. The Secretariat noted that, while the assisted enterprises now had the capacity to manufacture and sell CO_2-based XPS foam products, their manufacturing output had been reduced due to the COVID-19 pandemic, and CO_2-based products were still pricier than the HCFC-based ones. UNIDO affirmed that despite the price difference, product acceptance and market uptake of CO_2-based XPS foam in China progressed steadily. As the effects of the pandemic recede and the economy recovers, the manufacturing and sales of CO_2-based XPS foam are expected to return to former levels. Verifications conducted at the converted enterprises concluded that the change of technology did not have a negative impact either on the enterprises' manufacturing capacity or their ability to serve clients. It is expected that along with the implementation of HCFC quotas and the associated reduction in supply, the cost of HCFC-based products will continue to increase, making CO_2-based XPS foam products more competitive.

38. The Secretariat considers that maintaining the implementation of technical assistance activities, particularly with regard to the safety requirements of using ethanol and further optimizing CO_2-based technology, will be essential to smaller enterprises, for the most part converting without assistance from the Multilateral Fund.

Verification of the manufacturing line conversions

39. The Secretariat noted with appreciation that all manufacturing lines that were converted in 2021 had undergone verification.[12] Due to the COVID-19-related travel restrictions, UNIDO's international verifier could not visit the plants in person but participated in virtual visits. The verifier sent each enterprise a comprehensive questionnaire to be filled out in advance of his visits, reviewed the data provided, completed a remote assessment of converted lines through online meetings with enterprise representatives, visits to XPS foam workshops, and an inspection of equipment procured under the project. FECO and ISA were present on-site to verify completion of the projects, destruction of baseline equipment, termination of HCFC-based manufacturing, and initiation of CO_2-based XPS foam manufacturing. Local authorities certified the destruction of baseline equipment, absence of HCFC in the final product manufactured by the converted lines, and compliance with relevant national and environmental standards; certificates were included in the verification reports, along with photographs of equipment both installed and destroyed.[13]

[12] Paragraph 5(c) of the Agreement requires the submission of independent verification reports of a random sample of at least five per cent of the manufacturing lines which had completed their conversion in the year to be verified, on the understanding that the total aggregated HCFC consumption of the random sample of the manufacturing lines represents at least 10 per cent of the consumption phased out in manufacturing lines converted with financial assistance from the Multilateral Fund in the sector in that year.

[13] *Certificate of conformity of the XPS foam product with the National Standards at B1 fireproof level* issued by the National Centre for Safety Quality Supervision and Testing of Fire-proof Building Products; *Environmental*

Given the circumstances, the Secretariat considers the verification process followed by UNIDO to be acceptable, noting that the verifier's physical presence will be stipulated once travel restrictions are lifted.

Monitoring of the sustainability of conversions

40. Upon request, UNIDO provided additional information on the routine cooperation of the Ministry of Ecology and Environment and FECO with local EEBs with regard to monitoring, supervision, and training activities, as well as promoting alternative technologies and communicating related policies to XPS foam enterprises to ensure the sustainability of HCFC phase-out. In addition, UNIDO confirmed that the results of technical studies and training undertaken as part of the technical assistance component would be shared with the industry to help address any technical issues encountered in the adoption of new technology.

Project implementation and monitoring

41. UNDP as the overall lead agency for stage II of the HPMP in China provided a cumulative report on the project management unit (PMU) expenditures in line with decision 81/46(b). Based on that report, UNIDO's disbursements for the PMU in stage II of the XPS foam sector plan are summarized in table 5.

Table 5. PMU cumulative expenditures for stage II of the XPS foam sector plan (2017-2021)

Item	Description	Cost (US $)
Sector-specific costs	Project staff	890,770
	Domestic travel	111,135
	International travel	3,821
	Domestic meetings	68,495
	International meetings	0
	Consulting service	73,942
Sub-total for sector-specific costs		**1,148,163**
Operational costs	Shared costs (support staff, computers, internet, printing, office operation and maintenance)	1,132,784
Total disbursement		***2,280,947**

* Including US $1,650,821 funded by stage II of the HPMP and US $630,126 co-financed by the Government of China.

Gender policy implementation[14]

42. In line with the Multilateral Fund operational policy on gender mainstreaming, related activities continued to be implemented throughout stage II of the XPS foam sector plan, including encouraging the engagement of women in planning, policy and decision making, brainstorming and consultancy, monitoring and evaluation. This included, *inter alia*, recruitment of two women to the ISA team, and participation of 12 women (i.e., 40 per cent of all participants) in the training workshop provided to assist 11 XPS foam enterprises in their conversion to CO_2-based technology. The workshop included raising awareness on the importance of occupational health and safety for both female and male employees.

Conclusion

43. The Government of China remains in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the XPS foam sector plan, including the consumption target agreed for 2021. Significant progress achieved in the implementation of the four tranches of stage II includes the complete conversion of 10 enterprises and associated phase-out of 4,296.80 mt

Certificate and operation permission issued by the local EEBs; *Certificate that blowing agent retained in the product from the converted lines does not contain HCFC substances* issued by the National Building Material Industry Enclosure Material and Pipeline Production Quality Supervision and Test Centre.

[14] In line with decision 84/92(d), decision 90/48(c) encouraged bilateral and implementing agencies to continue ensuring that the operational gender mainstreaming policy was applied to all projects, taking into consideration the specific activities presented in table 2 of document UNEP/OzL.Pro/ExCom/90/37.

(242.61 ODP tonnes) of HCFCs. In line with paragraph 5(c) of the Agreement, the submission included verification results for six manufacturing lines converted to CO_2-based technology in four XPS foam enterprises, confirming the associated phase-out of 1,514.51 mt (85.87 ODP tonnes) of HCFCs. Over 23 per cent of funds approved for the fourth tranche have been disbursed to beneficiary enterprises. Funds from the fifth tranche will be used to initiate conversions to low-GWP alternatives in 11 additional enterprises and to continue policy- and technical-assistance-related activities, including *inter alia* training in support of sectoral transition provided by the ISA to XPS foam enterprises; revision of a product standard; and optimisation of CO_2-based technology through continued research on the use of heat-gluing technology in XPS foam production.

RECOMMENDATION

44. The Executive Committee may wish to consider:

(a) Noting the progress report on the implementation of the fourth tranche of the extruded polystyrene (XPS) foam sector plan of stage II of the HCFC phase-out management plan (HPMP) for China; and

(b) Approving the fifth tranche of the XPS foam sector plan of stage II of the HPMP for China, and the corresponding 2023 tranche implementation plan, in the amount of US $2,000,000, plus agency support costs of US $140,000 for UNIDO.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) solvent sector	UNDP	77th	100 % in 2026

(II) LATEST ARTICLE 7 DATA (Annex C Group l)	Year: 2021	10,120.64 ODP tonnes

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2021
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,155.00	3,025.00	2,844.63		7,024.63
HCFC-123			10.80	8.13		18.93
HCFC-124				(0.70)		(0.70)
HCFC-141b		2,505.31			275.00	2,780.31
HCFC-142b		162.50	4.23	130.75		297.48

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	19,269.00	Starting point for sustained aggregate reductions:	18,865.44
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	12,161.02	Remaining:	6,704.42

(V) ENDORSED BUSINESS PLAN		2022	2023	2024	Total
UNDP	ODS phase-out (ODP tonnes)	17.80	35.61	0.0	53.40
	Funding (US $)	1,070,000	2,140,000	0	3,210,000

(VI) PROJECT DATA			2016	2017	20182019	2020*	2021	2022	2023	2024	2025	2026	Total
Montreal Protocol consumption limits (ODP tonnes)			16,978.9	16,978.9	15,048.1	11,772.0	11,772.0	11,772.0	8,618.0	8,618.0	5,063.5	4,513.5	n/a
Maximum allowable consumption (ODP tonnes)			455.2	455.2	395.4	321.2	321.2	321.2	148.3	148.3	55.0	0.0	n/a
Funding agreed in principle (US $)**	UNDP	Project costs	2,821,937	3,777,190	0	12,946,782	2,500,000	1,000,000	2,000,000	0	523,431	0	25,569,340
		Support costs	197,536	264,403	0	906,275	175,000	70,000	140,000	0	36,640	0	1,789,854
Funds approved by ExCom (US $)		Project costs	2,821,937	3,777,190	0	12,946,782	2,500,000		0	0	0	0	22,045,909
		Support costs	197,536	264,403	0	906,275	175,000		0	0	0	0	1,543,214
Total funds recommended for approval at this meeting (US $)		Project costs						1,000,000					1,000,000
		Support costs						70,000					70,000

* The third (2018) tranche was submitted to the 82nd, 83rd and 84th meetings, and deferred for consideration at the 85th meeting (decisions 82/71(b), 83/55 and 84/69(a)).

** Total adjusted value of stage II of the HPMP for the solvent sector plan and the funding level of tranches between 2020 and 2026 were approved at the 86th meeting (decision 86/34).

Secretariat's recommendation:	Individual consideration

PROJECT DESCRIPTION

45. On behalf of the Government of China, UNDP as the designated implementing agency has submitted a request for funding for the fifth tranche of the solvent sector plan of stage II of the HCFC phase-out management plan (HPMP), at the amount of US $1,000,000, plus agency support costs of US $70,000.[15] The submission includes a progress report on the implementation of the fourth tranche of the solvent sector plan, verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee, and the tranche implementation plan for 2023-2024.

46. This submission is based on the revised plan of action for the solvent sector for the period 2021-2026 at the total amount of US $6,023,431, plus agency support costs, approved by the Executive Committee at the 86th meeting. The value of the adjusted total funding approved in principle for stage II of the solvent sector plan is US $25,569,340, plus agency support costs (decision 86/34).

47. The revised plan of action for 2021-2026 comprises the policy and regulatory interventions to ensure timely and sustainable phase-out of HCFCs; technical assistance to strengthen the technical capacity of the industry and to promote the adoption of low-global-warming-potential (GWP) alternatives; and project management. It also includes investment activities to convert 18 small and medium-sized enterprises (SMEs) in the disposable medical devices (DMD) sub-sector and seven SMEs in the electronic degreasing sub-sector, with a verified HCFC baseline consumption of 372.19 metric tonnes (mt) or 40.94 ODP tonnes of HCFC-141b. The total funding allocated for these enterprises is US $2,014,421, at a cost-effectiveness level of US $9.86/kg, which is lower than that in the sector plan as originally approved (US $13.00/kg). All enterprises will be using low-GWP alternatives (e.g., KC-6, hydrocarbons or diluent, trans-1, 2-dichloroethylene and hydrofluoroether, water-based cleaning agent, modified alcohol, nano silicon carbonate, F-solvents, or naphthenic aromatics). Upon completion, stage II will phase out 455.2 ODP tonnes of HCFC-141b consumption in the solvent sector and will reduce greenhouse gas emissions by 2.98 million CO_2-equivalent tonnes.

Progress report on the implementation of the fourth tranche of stage II of the solvent sector plan

48. The agreement for the implementation of stage II of the solvent sector plan between the Foreign Environmental Cooperation Centre (FECO) and UNDP was signed in April 2017 based on the approval of stage II at the 77th meeting. This agreement was amended on the basis of each tranche approval, with the latest amendment in April 2022 to include the funding for the fourth tranche (2021) approved at the 88th meeting and the associated revised work plan covering the period 2022-2023.

Regulatory activities

49. FECO continued to issue quota permits to solvent enterprises and, as reported in the previous progress report, had issued a circular on the management of construction of facilities producing or using ozone-depleting substances and banning any new establishment, retrofitting, or expansion of facilities for production or use of HCFCs in application such as refrigerants, foam-blowing agents, solvents, or chemical process agents.

50. The research study to ban the use of HCFCs in the medical devices sub-sector initiated in June 2018 had been completed; the final report was issued in April 2022 after consultation with experts, enterprise representatives and other stakeholders. Based on the recommendations of the report, the ban on using HCFCs in the medical devices sub-sector of the solvent sector in China is being considered for issue in January 2023, and enforcement in July 2023.

[15] As per the letter of 13 September 2022 from the Ministry of Ecology and Environment of China to UNDP.

Investment activities

51. As of August 2022, FECO signed contracts with a total of 49 solvent enterprises in two batches:

(a) The first batch of 24 enterprises (comprising 514 production lines) had signed contracts under the previous tranches; HCFC-141b consumption to be phased out amounted to 1,176.2 mt (129.4 ODP tonnes), representing 28 per cent of the reduction target of 455.2 ODP tonnes for stage II of the solvent sector plan. Out of the 24 enterprises, 19 received national acceptance; three have completed their installation and trial productions and are preparing verification documents; one has completed procurement and installation, and one had withdrawn from the project due to closure;[16] and

(b) The second batch of 25 eligible enterprises (mostly SMEs, each with annual consumption of no more than 5 mt of HCFC-141b) signed contracts in July 2022; these enterprises, comprising 347 production lines in 18 enterprises in the DMD sub-sector and seven enterprises in the metal and electronics sub-sectors, have a verified consumption of 372.2 mt (40.9 ODP tonnes) of HCFC-141b. The total project value for these enterprises is US $2,000,907.

52. A summary of progress in the implementation of the solvent sector plan is presented in table 1.

Table 1. Status of progress of enterprises for conversion in the solvent sector

Status of implementation	No. of enterprises	HCFC-141b consumption *		Value of contracts (US $)	Estimated date of conversion
		mt	ODP tonnes		
First batch of enterprises	**24**	**1,176.2**	**129.4**	**20,040,546**	
Equipment installed, completed verification, received national acceptance, and started production	19	966.1	106.2	12,273,435	Completed
Equipment installed, completed trial production, pending verification	3	65.3	7.2	5,299,130	December 2022
Equipment installed, ready for trial production	1	40.1	4.5	621,197	December 2022
Enterprise withdrew due to closure	(1)	104.7	11.5	(1,846,784)	Funds returned and consumption phased out
Sub-total for the first batch	**23**	**1,176.2**	**129.4**	**18,193,762**	**n/a**
Second batch of enterprises All contracts signed	**25**	**372.2**	**40.9**	**2,000,907**	Project implementation in fifth tranche
Total	**48**	**1,548.8**	**170.3**	**20,194,669**	**n/a**

* Data for 2016 which is the year used as reference for HCFC consumption for stage II of the HPMP.

[16] One beneficiary (Dechang Beihai) withdrew its participation in the HPMP (as the enterprise was closed), thereby reducing the total contract value to US $18,193,762 but the overall phase-out of HCFC-141b remains unchanged. The US $1,846,784, plus agency supports costs of US $129,275, was returned to the Fund.

Verification of converted manufacturing lines

53. In accordance with paragraph 5(c)[17] of the Agreement, UNDP commissioned the verification of six out of the 19 enterprises that had completed their conversions in 2021; three were submitted at the 88th meeting[18] and three were included in the present submission. The three new verification reports confirmed *inter alia* that the enterprises had a total of 68 converted lines with a total phase out of 96.13 mt[19] (representing 51 per cent of the total HCFC-141b phased out from July 2021 to July 2022). These three enterprises introduced HC-based solvents; have completely stopped using HCFC-141b; and destroyed the replaced baseline equipment, as confirmed by a public notary and the audit office. The payment of incremental operating costs (IOCs) is made after the receipt of a report confirming that the production lines are operational for at least six months after the trial run is completed. UNDP indicated that the verifications for the rest of the enterprises that had completed conversion was ongoing, and that their completion was delayed due to travel restrictions in some provinces. The verification for the three enterprises submitted to this meeting was conducted in one province through in-person site visits by a local consultant commissioned by UNDP.

Technical assistance activities

54. The following technical assistance activities were implemented between 2021 and 2022:

(a) In June 2022, FECO signed a consultation service contract with the China Industry Cleaning Association to assist FECO in conducting HCFC phase-out activities over the next five years as the implementation support agency (ISA) of the solvent sector. The ISA established an ODS team consisting of a team leader and two staff;

(b) Considering the funding reduction, the ISA assisted in providing guidance to project enterprises in the preparation and formulation of conversion plans based on their specific needs. In order to provide appropriate technical guidance, the ISA team interacted closely with FECO to identify and find collaborative solutions for technical issues;

(c) Assisted by the ISA, FECO guided the second batch of 25 enterprises to prepare implementation plans according to their own situation and specific production needs. In June 2022, FECO organized technical experts to assist the ISA in conducting a meeting to review and evaluate the final implementation plans of the 25 enterprises; and

(d) Following the progress of implementation of the conversion projects at the 23 enterprises, FECO along with the ISA and the Beijing Daxin Accounting Firm continued to carry out performance verifications. During the 2021-2022 period, eight verifications have been completed. The remaining four enterprises are expected to be verified before the end of 2022 once the travel restrictions allow.

[17] The country has to submit a verification report of a random sample of at least 5 per cent of the manufacturing lines which had completed their conversion in the year to be verified, on the understanding that the total aggregated HCFC consumption of the random sample of the manufacturing lines represents at least 10 per cent of the sector consumption phased out in that year.

[18] UNEP/OzL.Pro/ExCom/88/43

[19] UNDP based its verification ratio on the actual tonnage phased out from the six enterprises that that received national acceptance from July 2021 to July 2022 (170 production lines and 187.25 mt of HCFC phased out); the verification ratio of the three enterprises selected (68 lines and 96.1 mt of HCFCs phased out) is therefore 40 per cent based on the converted manufacturing lines, and 51 per cent based on consumption phase-out.

Level of fund disbursement

55. As of September 2022, of the US $22,045,909 approved so far, US $20,069,469 had been disbursed by UNDP to FECO, and US $18,370,714 (83 per cent) by FECO to beneficiaries, as shown in table 2. The balance of US $3,675,195 will be disbursed in 2023.

Table 2. Status of disbursement for stage II of the solvent sector plan as of September 2022 (US $)

Description		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Total
Funds approved for UNDP		* 2,821,937	* 3,777,190	12,946,782	2,500,000	**22,045,909**
Disbursement from UNDP to FECO	**Total**	**2,796,937**	**3,741,089**	**12,299,443**	**1,232,000**	**20,069,469**
	Ratio (%)	99	99	95	49	91
Disbursement from FECO to beneficiaries	**Total**	**2,796,937**	**** 3,742,190**	**11,079,967**	**751,620**	**18,370,714**
	Ratio (%)	99	99	86	30	83
Fund balance		25,000	35,000	1,866,815	1,748,380	3,675,195

* A total of US $60,000 from the first two tranches was retained by UNDP to cover activities to be implemented by UNDP.
** Total disbursement under the second tranche is US $3,741,089 plus US $1,101 (interest accrued up to December 2016 and offset from the transfer for the second tranche, in line with decision 80/17), for a total of US $3,742,190.

Implementation plan for the fifth tranche of stage II of the solvent sector plan

56. The following activities will be implemented by UNDP until December 2024:

(a) *Policy actions:* FECO will continue to enforce quota management in the solvent sector, and collaborate with local ecology and environment bureaus (EEBs) to strengthen the registration systems for HCFC consumption and sales; and the ban on the use of HCFCs in the DMD sub-sector is expected to be issued in January 2023 and enforced in July 2023 (ongoing activities);

(b) *Enterprise-level activities:* the ongoing conversion of the four remaining enterprises from the first batch is expected to be completed by December 2022; performance verifications will be conducted for those enterprises which have completed conversions and are awaiting national acceptance; project implementation will continue to be initiated for the second batch of the 25 enterprises; conversions at DMD enterprises are expected to be completed before July 2023, and at the metal and electronics enterprises by December 2024; disbursements will be made to enterprises after milestones stipulated in the conversion contracts are achieved (US $505,000);

(c) *Technical assistance activities:* FECO and the ISA will continue to organize performance verifications once projects reach their completion milestones; supervise the second batch of solvent enterprises and provide technical support for the sector; conduct a study on alternatives such as air cleaning and laser cleaning for the metal and electronic sub-sectors; organize workshops and meetings for relevant stakeholders to promote knowledge sharing and lessons learned; and evaluate relevant regulations to support the phase-out in the sector (US $440,000); and

(d) *Project management*: project management costs will include monitoring and verification, reporting and coordination, and financial and operational management (US $55,000).

Project implementation and monitoring

57. UNDP as the lead implementing agency provided a consolidated report on the project management unit (PMU) expenditures for stage II of the HPMP for China, in line with decision 81/46(b). Based on that report, the expenditures related to the PMU for stage II of the solvent sector plan are summarized in table 3.

Table 3. PMU cumulative expenditures for stage II of the solvent sector plan (2017-2021)

Item	Description	Cost (US $)
Sector--specific costs	Project staff	192,112
	Domestic travel	52,133
	International travel	0
	Domestic meetings	31,214
	International meetings	0
	Consulting service	34,221
Sub-total for sector-specific costs		**309,680**
Operational costs	Shared costs (support staff, computers, Internet, printing, office operation and maintenance)	522,238
Total disbursement*		**831,918**

* Additional expenditure from the Government (e.g., operational as well as in-kind costs) are not included in the table.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

58. Consumption of HCFCs in the solvent sector in 2021 was reported at 2,500 mt (275 ODP tonnes), which is lower than the maximum allowable consumption established in the Agreement between the Government of China and the Executive Committee, as shown in table 4.

Table 4. Consumption of HCFCs in the solvent sector

Description		2017	2018	2019	2020	2021
Consumption*	mt	3,638.40	3,438.00	3,539.10	2,800.00	2,500.00
	ODP tonnes	396.96	375.12	385.98	308.00	275.00
Maximum allowable consumption**	mt	4,172.00	3,624.5	3,624.5	2,944.91	2,944.91
	ODP tonnes	455.2	395.4	395.4	321.2	321.2
Phase-out targets	mt	n/a	548.2	n/a	679.60	n/a
	ODP tonnes	n/a	59.8	n/a	74.16	n/a

* As per the country programme implementation report.
** As per the Agreement revised at the 86th meeting for stage II from 2016-2021.

59. The reduction in HCFC consumption in the solvent sector was achieved through the application of the HCFC production quota and domestic sale quota issued for each producer and the application of the HCFC consumption quotas to manufacturing enterprises using more than 100 mt of HCFCs. In addition, stage I of the HPMP for the solvent sector phased out 599 mt (65.90 ODP tonnes) of HCFC-141b; and completion of the conversions of the first batch of enterprises in stage II also contributed to the reduction in HCFC-141b consumption. The consumption reported for 2021 is 10 per cent lower than the 2020 consumption and reflects the progress in the implementation of the conversion projects in the solvent sector.

Status of progress

60. The Secretariat noted that 25 new enterprises (mostly SMEs) had signed contracts for conversions and asked UNDP for further updates on additional activities completed so far. UNDP explained that as these contracts were signed only in July 2022, enterprises were currently developing their implementation plans and reviewing the requirements for equipment procurement associated with conversions; a more detailed report would be provided to the 93rd meeting. UNDP reiterated that funding for these enterprises would be covered by the 2021 tranche, except for two enterprises funded under the present (2022) tranche. UNDP also indicated that FECO was planning to identify a third set of enterprises, with some funding to

be included in this tranche. The detailed number of enterprises to be included in the third batch will be provided to the 93rd meeting.

Monitoring of the sustainability of conversions

61. The Secretariat sought clarification on how those solvent enterprises that had completed their conversions both in stage I and stage II would be monitored to ensure that they sustain the achieved phase-out, in addition to the future ban of the use of HCFCs in the DMD sub-sector which is expected to be enforced in 2023. It was clarified that local EEBs conducted routine monitoring of the converted enterprises, and that these were banned from using HCFCs. In addition, FECO, in collaboration with the industry association, regularly conducts workshops and technical seminars to reinforce the phase-out strategy for the sector and policy requirements, and to raise awareness on alternative technologies for this sector.

Project implementation and monitoring

62. UNDP as the designated agency provided a report on PMU expenditures in line with decisions 81/46(b) and 83/61(b).[20] Based on that report, UNDP's disbursements for the PMU in stage II of the solvent sector plan are summarized in table 5 below.

Table 5. PMU budget for 2021-2022, stage II of the solvent sector plan in China

Item	Description	Cost (US $)		
		2021	January-June 2022	Total
Sector-specific costs	Project staff	66,857	12,700	79,557
	Domestic travel	8,065	3,446	11,511
	International travel	0	0	
	Domestic meeting	11,810	2,064	13,874
	International meetings	0	0	
	Consulting service	4,363	2,262	6,625
Sub-total for sector-specific costs		**91,095**	**20,472**	**111,567**
Operational costs	Shared costs (support staff, computers, internet, printing, office operation, maintenance	147,881	34,528	182,409
Total budget		**238,976**	**55,000**	**293,976**

Gender policy implementation[21]

63. The implementation of stage II of the solvent sector plan will continue to take into account gender mainstreaming activities. Female engagement will be sought and encouraged in all project stages, including planning, policy and decision making, brainstorming and advisory, monitoring and evaluation. Gender-disaggregated data will be collected for training and workshops. Capacity-building activities will take into consideration gender-sensitive approaches during the technical assistance activities, including highlighting gender issues in outreach and training materials, promoting gender equity when applicable, and discussing gender issues during the thematic workshops to share experiences and lessons learned on

[20] To request bilateral and implementing agencies, when submitting tranche funding requests for HCFC phase-out management plans, to include in the tranche implementation plan, the specific activities that would be implemented by the PMU, and the associated funding; and in the implementation report of the previous tranche, the activities implemented by the PMU and the associated funding disbursed.

[21] In line with decision 84/92(d), decision 90/48(c) encouraged bilateral and implementing agencies to continue ensuring that the operational gender mainstreaming policy was applied to all projects, taking into consideration the specific activities presented in table 2 of document UNEP/OzL.Pro/ExCom/90/37.

gender mainstreaming.

Conclusion

64. The solvent sector plan is progressing with a successful implementation of activities for the first batch of enterprises, 19 of which have completed their conversions and received national acceptance for a total phase-out of 106.2 ODP tonnes of HCFC-141b. Three enterprises are awaiting national acceptance and verification, and one is expected to complete its conversion by December 2022, resulting in an additional phase-out of 11.7 ODP tonnes of HCFC-141b. The total phase-out from the first batch of enterprises will constitutes 28 per cent of the HCFC reduction target for stage II of the solvent sector plan. Contracts with FECO have been signed for the second set of 25 enterprises with an estimated consumption of 372.2 mt (40.9 ODP tonnes) of HCFC-141b. The disbursement rate of the funding approved so far is 83 per cent. In view of the implementation progress, the Secretariat recommends approval of the fifth tranche of the solvent sector plan.

RECOMMENDATION

65. The Executive Committee may wish to consider:

(a) Noting the progress report on the implementation of the fourth tranche of the solvent sector plan of stage II of the HCFC phase-out management plan (HPMP) for China; and

(b) Approving the fifth tranche of the solvent sector plan of stage II of the HPMP for China, and the corresponding 2023-2024 tranche implementation plan, in the amount of US $1,000,000, plus agency support costs of US $70,000 for UNDP.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

CHINA

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) refrigeration servicing and enabling programme	UNEP (lead), Germany and Japan	76th	n/a

(II) LATEST ARTICLE 7 DATA (Annex C Group l)	Year: 2021	10,120.64 (ODP tonnes)

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2021
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,155.00	3,025.00	2,844.63		7,024.63
HCFC-123			10.80	8.13		18.93
HCFC-124				(0.70)		(0.70)
HCFC-141b		2,505.31			275.00	2,780.31
HCFC-142b		162.50	4.23	130.75		297.48

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	19,269.00	Starting point for sustained aggregate reductions:	18,865.44
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	12,161.02	Remaining:	6,704.42

(V) ENDORSED BUSINESS PLAN		2022	2023	2024	Total
UNEP	ODS phase-out (ODP tonnes)	46.08	51.77	77.66	175.51
	Funding (US $)	1,975,325	2,219,467	3,329,200	7,523,99
Germany	ODS phase-out (ODP tonnes)	5.70	0.0	0.0	5.70
	Funding (US $)	246,078	0	0	246,078
Japan	ODS phase-out (ODP tonnes)	0.0	0.0	0.0	0.0
	Funding (US $)	0	0	0	0

(VI) PROJECT DATA			2016	2017	2018	2019*	2020	2021	2022	2023	2024	2025	2026	Total
Montreal Protocol consumption limits (ODP tonnes)			17,342.1	17,342.1	17,342.1	17,342.1	12,524.9	12,524.9	12,524.9	12,524.9	12,524.9	6,262.4	6,262.4	n/a
Maximum allowable consumption (ODP tonnes) **			16,978.9	16,978.9	15,048.1	15,048.1	11,772.0	11,772.0	11,772.0	8,618.0	8,618.0	5,063.5	5,063.5	n/a
Funding agreed in principle (US $)	UNEP	Project costs	3,299,132	2,570,000	0	1,000,000	0	1,160,000	1,780,000	2,000,000	3,000,000	1,200,000	2,517,105	18,526,237
		Support costs	364,651	284,061	0	120,000	0	127,291	195,325	219,467	329,200	131,680	276,211	2,047,886
	Germany	Project costs	300,000	0	0	0	0	600,000	220,000	0	0	0	0	1,120,000
		Support costs	36,000	0	0	0	0	71,122	26,078	0	0	0	0	133,200
	Japan	Project costs	80,000	80,000	0	0	0	240,000	0	0	0	0	0	400,000
		Support costs	10,400	10,400	0	0	0	31,200	0	0	0	0	0	52,000
Funds approved by ExCom (US $)		Project costs	3,679,132	0	2,650,000	1,000,000	0	2,000,000		0	0	0	0	9,329,132
		Support costs	411,051	0	294,461	120,000	0	229,613		0	0	0	0	1,055,125
Total funds recommended for approval at this meeting (US $)		Project costs							2,000,000					2,000,000
		Support costs							221,403					221,403

* The third (2018) tranche was submitted at the 82nd meeting at a value of US $3,850,000, plus agency support costs of US $431,831, and deferred for consideration at the 84th meeting (decisions 82/71(b) and 83/55).

** The total maximum allowable consumption of Annex C, Group I substances for the 2021 to 2026 period, the total adjusted value of stage II of the HPMP for the sector, and the funding level of tranches between 2020 and 2026 were approved at the 86th meeting (decision 86/34).

Secretariat's recommendation:	Individual consideration

PROJECT DESCRIPTION

66. On behalf of the Government of China, UNEP as the lead implementing agency has submitted a request for funding for the fifth tranche of the refrigeration and air-conditioning servicing sector and the national enabling programme[22] of stage II of the HCFC phase-out management plan (HPMP), at a total cost of US $2,221,403, consisting of US $1,780,000, plus agency support costs of US $195,325 for UNEP and US $220,000, plus agency support costs of US $26,078 for the Government of Germany.[23] The submission includes a progress report on the implementation of the fourth tranche of the refrigeration servicing sector and the tranche implementation plan for 2022-2023.

67. This submission is based on the revised plan of action for the refrigeration servicing sector for the period 2021-2026 at the total amount of US $12,717,105, plus agency support costs, as approved by the Executive Committee at the 86th meeting. The value of the adjusted total funding approved in principle for stage II of the refrigeration servicing sector is US $20,046,237, plus agency support costs (decision 86/34).

68. Stage II of the refrigeration servicing sector plan comprises a component related to phase-out activities in the sector and an enabling component to build capacity at the national and local levels, strengthen the communication and coordination mechanisms of relevant departments associated with the HPMP implementation, ensure continuous implementation of policies and regulations on controlled substances, and improve the monitoring and reporting of imports and exports of controlled substances in order to reduce the risks of the illegal trade of ODSs (ozone-depleting substances).

69. The policy studies, revision of standards and codes, technician training and certification, awareness and outreach activities included in the refrigeration servicing sector plan, will also support the phase-out in the room air-conditioning and heat pump water heaters (RAC) and the industrial and commercial refrigeration and air-conditioning (ICR) manufacturing sectors.

Progress report on implementation of the fourth tranche of stage II in the refrigeration servicing sector plan

70. As of September 2022, the following activities were implemented:

(a) The project cooperation agreement (PCA) for the fourth tranche in the amount of US $1,400,000, covering the funding tranches of UNEP and the Government of Japan, was signed in April 2022 between UNEP and the Foreign Environmental Cooperation Centre (FECO) and the first installment under this PCA was transferred from UNEP to FECO in May 2022;

(b) Two codes were finalized and published: for the servicing and maintenance of heat pumps with focus on refrigerant emissions, and technical standards and specifications for the tools and equipment used in the training of servicing technicians. A draft code containing operational specifications for detecting refrigerant leakage and for collecting and recording data during the servicing and maintenance of refrigeration equipment has been developed and is presently under technical review;

(c) The survey reports were completed for the two studies on the management of ODS recovery/reuse and destruction, and the policy reports are under preparation. The study on strengthening the filing management of ODS in the refrigeration servicing sector was also completed;

[22] The full name of the refrigeration and air-conditioning servicing sector and the national enabling programme is abbreviated to "refrigeration servicing sector" throughout the present document.
[23] As per the letter of 13 September 2022 from the Ministry of Ecology and Environment of China to UNEP.

(d) Three studies were completed on the monitoring of ODS concentrations in the atmosphere; formulating the sampling and analyzing standards to test ODSs in industrial products; and strengthening ODS management in the environmental impact assessment and pollutant discharge permit system;

(e) The ODS Import and Export Management Office continued to review applications submitted by enterprises, issued permits and licenses, maintained operation of the ODS import and export management paperless approval system, and developed a proposal to conduct a national survey on illegal trade in ODSs and the effectiveness of law enforcement for the development of an ODS intelligence collection system to strengthen risk profiling in ODS trade;

(f) Training on ODS phase-out management was provided to 350 participants from relevant Government departments and enterprises, and 500 participants were trained in ODS importing and exporting for enterprises. Capacity-building projects were implemented for eight customs and anti-smuggling bureaus, including in-person training for 437 customs officers and workshops at 55 relevant enterprises;

(g) As of June 2022, 6,113 trainers and technicians, 754 of them women, were trained in good refrigeration servicing practices through 10 training centres; over 20,000 technicians have been trained during 2019-2022 through the four manufacturers' nationwide after-sales programme; and the Chinese Association of Refrigeration organized four training sessions for the cold chain sector attended by 122 trainers and technicians, including three women;

(h) The bidding for the demonstration project of CO_2 trans-critical system applications in the supermarket sector was initiated and the contract will be awarded by the end of 2022. The project aims to study the reduced consumption of HCFCs in the supermarket sector and to promote good servicing and maintenance practices, including refrigerant recycling and recovery, training, and outreach activities;

(i) As part of the pilot city component to build local capacity and establish policy frameworks to support the phase-out of HCFCs, agreements were signed with two additional cities, Tianjin and Hangzhou in Zhejiang Province; the work plan for each city is being developed and the implementation is expected to launch in November 2022. Continuing activities in the other pilot cities (Shandong, Henan, and Shenzhen) included local industry surveys, pilot ODS recycling projects, promoting certification systems for servicing technicians, and outreach on alternative technologies. The three cities are expected to complete their activities by the end of 2022, and a final report with policy recommendation will be submitted to FECO and the Ministry of Ecology and Environment;

(j) Coordination meeting on the implementation of the HPMP was held with about 50 participants from bilateral and multilateral implementing agencies and organizations; and

(k) An international workshop on the use of HCFC-22 in the RAC servicing sector and a meeting with over 100 stakeholders were held to present the phase-out plan; terms of reference for outreach activities promoting alternative technologies were finalized in September 2022; the Ozone2Climate Technologies roadshow and roundtable hosted over 1,000 participants; and other outreach and awareness activities were implemented, including the celebration of the International Ozone Day, the launch of a national Ozone2Climate art contest, the printing of brochures, and video publications.

Level of fund disbursement

71. As of September 2022, of the US $9,329,132 approved so far, US $6,251,320 (67 per cent) had been disbursed by FECO to beneficiaries, as shown in table 1. The balance of US $3,077,812 will be disbursed in 2023.

Table 1. Status of disbursement for stage II of the refrigeration servicing sector plan (US $)

Description		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Total
Funds approved	UNEP	3,299,132	2,570,000	1,000,000	1,160,000	8,029,132
	Japan	80,000	80,000	0	240,000	400,000
	Germany	300,000	0	0	600,000	900,000
	Total	**3,679,132**	**2,650,000**	**1,000,000**	**2,000,000**	**9,329,132**
Disbursement from implementing agencies to FECO	UNEP	3,279,276	* 2,640,000	925,000	*700,000	7,619,276
	Japan	75,000		0		
	Germany	300,000	0	0	51,000	351,000
	Total	**3,654,276**	**2,640,000**	**925,000**	**751,000**	**7,970,276**
	Ratio (%)	99	100	93	38	85
Disbursement from FECO to beneficiaries	**Total**	**3,331,405**	**2,020,029**	**484,051**	**415,835**	**6,251,320**
	Ratio (%)	91	76	48	21	67
Fund balance		347,727	629,971	515,949	1,584,165	3,077,812

* Comprising both UNEP and Japan funding components.

Implementation plan for the fifth tranche of the refrigeration servicing sector plan of stage II of the HPMP

72. The following activities will be implemented in 2023:

(a) Development of five codes and standards, including technical specifications for the servicing and maintenance of cold storage systems, water chillers, multi-split air conditioners, and RAC equipment for industrial and commercial applications; and for equipment with flammable refrigerants (UNEP) (US $150,000);

(b) Organization of four training workshops/network meetings on ODS enforcement on the provincial and municipal levels between the local ecology and environment bureaus (EEBs) and the ODS management and law enforcement officers (US $150,000); local capacity building on Montreal Protocol compliance for nine EEBs; a coordination meeting on the implementation of the HPMP for relevant stakeholders; overseas training tour on Montreal Protocol implementation in other countries for ODS management and law enforcement officers with the EEBs; a study project on national trade policies and ODS control, implementation needs, guidance on alternative technologies, and policy development (UNEP) (US $410,000);

(c) Organization of training workshops for 150 customs and law enforcement officers and 260 participants from commercial departments and enterprises on the Montreal Protocol control requirements, import and export policies, combating the illegal trade of ODSs, and license issuance; outreach on ODS import/export controls; research on the relationship between national trade policies and ODS control (UNEP) (US $209,000);

(d) Establishment of a law enforcement cooperation centre for combating the illegal trade of ODSs; strengthening law enforcement and capacity building for China customs to combat illegal trade; development of guidelines for the investigation and handling of cases of illegal ODS trade; certification of the ODS import and export paperless management approval system (UNEP) (US $241,000);

(e) Project initiation in the pilot cities of Tianjin and Hangzhou (Zhejiang Province), including a survey of the servicing sector; strengthening of the filing and data management system; promoting good practices through training and outreach; and demonstration of refrigerant management, recycling, and reuse (UNEP) (US $140,000);

(f) Training of 400 technicians from manufacturer-owned servicing workshops focusing on small and medium-sized enterprises in the ICR sector; selection of one national training centre to organize training for trainers from vocational schools and the industry; training of 400 trainers and technicians on good servicing practices and an international virtual training on flammable refrigerants for technicians (UNEP) (US $203,700);

(g) Selection of manufacturers to provide training to 1,000 technicians on the servicing of R-290-based equipment to support the use of alternative technologies in refrigeration (Government of Germany) (US $151,300);

(h) Outreach and training workshops to promote good practices and alternative technologies in the supermarket sector (Government of Germany) (US $50,000);

(i) Awareness-raising, including celebration of the International Ozone Day; design, production, and dissemination of outreach materials; maintenance and updates of the "OzonAction in China" website; and organization of the Ozone2Climate roadshow and roundtable events (UNEP) (US $275,000); and

(j) Project management and monitoring, comprising the cost of staff (US $107,535), travel (US $27,445), and meetings and consultations (US $35,020), including US $18,700 for the Government of Germany and US $151,300 for UNEP (US $170,000).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

73. In 2021, consumption of HCFCs in the servicing sector was 54,106.80 metric tonnes (mt) or 2,982.81 ODP tonnes, as shown in table 2.[24]

Table 2. HCFC consumption in the refrigeration servicing sector (2017-2021 country programme data)

HCFC	2017	2018	2019	2020	2021	Average*
mt						
HCFC-22	51,482.65	59,821.81	58,005.55	53,450.32	51,720.55	64,466.58
HCFC-123	347.29	437.57	404.58	358.18	406.30	113.75
HCFC-124	(5.71)	(5.32)	37.71	(23.20)	(31.65)	139.56
HCFC-142b	662.43	276.97	909.55	584.36	2011.60	5,338.58
Total (mt)	**52,486.66**	**60,531.03**	**59,357.39**	**54,369.66**	**54,106.80**	**70,058.47**
ODP tonnes						
HCFC-22	2,831.55	3,290.20	3,190.31	2,939.77	2,844.63	3,545.68
HCFC-123	6.95	8.75	8.09	7.16	8.13	2.30
HCFC-124	(0.13)	(0.12)	0.75	(0.51)	(0.70)	3.05
HCFC-142b	43.06	18.00	59.12	37.98	130.75	347.03
Total (ODP tonnes)	**2,881.42**	**3,316.83**	**3,258.27**	**2,984.40**	**2,982.81**	**3,898.06**

* Average consumption in 2009 and 2010.

[24] No maximum allowable consumption of HCFCs has been specified for the refrigeration servicing sector in the Agreement between the Government of China and the Executive Committee.

74. The Government of China continues to enforce a strict licensing and quota management system for HCFC production and consumption and is committed to meeting the phase-out target for stage II of the refrigeration servicing sector while supporting the concomitant phase-out in the RAC and ICR manufacturing sectors, as it is expected that the consumption of HCFC-22 for servicing will continue to decrease with further implementation of the activities in the RAC and ICR manufacturing sectors. The Government of China also indicated that the consumption of HCFC-22 for servicing RAC equipment was not affected by the pandemic.

75. The continued training of technicians improved their technical knowledge and skills with regard to installation and servicing, resulting in reduced rates of equipment failure, leakage, and refrigerant recharge and a higher rate of refrigerant recovery and reuse, and consequently decreasing the consumption of HCFC-22 in the sector. As for the consumption of HCFC-142b which increased from 584.36 mt (37.98 ODP tonnes) in 2020 to 2,011.60 mt (130.75 ODP tonnes) in 2021, it was due to stockpiling and is used in the servicing sector in AC to cool the operating room for tower cranes.

76. The training of technicians through the manufacturers' after-sales programme is effectively promoting good installation and servicing practices with the use of R-290 in the RAC sector and other alternative technologies in the ICR sector, supporting these sectors' conversion to HCFC-free products.

Status of progress

77. The Secretariat requested an update on the demonstration project for one beneficiary in the cold chain sector to collect data on HCFC consumption and promote good servicing practices including refrigerant recovery and recycling. UNEP confirmed that a demonstration trans-critical CO_2 system had been successfully installed in the Chaoshifa supermarket, and that relevant data would be collected and analysed to compare charge sizes and annual leakage rates. It is estimated that the project could result in carbon emission reductions of 526 tons CO2-eq over the expected 15-year lifespan of equipment. As the system was installed only in 2020, no servicing and maintenance data had been collected yet; once this information becomes available, it will be used to develop a case study for dissemination in the supermarket sector.

78. The Secretariat further requested an update on the status of activities implemented under the Government of Germany component, including training activities in the supermarket sub-sector and the after-sales training on the use of R-290 technology in the ICR sector. UNEP clarified that adjustments had been made to targeted outcomes of the supermarket sector training activities, reflecting changes in the workplan due to the revised funding levels. Regarding the after-sales training through manufactures on the use of R-290 in servicing, the contract with a local partner is still under the procurement process. Activities will be expedited once the contract is signed.

Gender policy implementation[25]

79. Gender mainstreaming policies and gender equity will be considered throughout all project phases, included planning, decision making, implementation, monitoring and evaluation of the project. Female participation will be encouraged at events and in training and outreach activities; female instructors will be sought out and encouraged for trainings. Sex-disaggregated data will be collected from activities. Gender equity will be considered in outreach and communications materials.

[25] In line with decision 84/92(d), decision 90/48(c) encouraged bilateral and implementing agencies to continue ensuring that the operational gender mainstreaming policy was applied to all projects, taking into consideration the specific activities presented in table 2 of document UNEP/OzL.Pro/ExCom/90/37.

Project implementation and monitoring

80. In line with decision 81/46(b), UNEP as the lead implementing agency for the refrigeration servicing sector of stage II of the HPMP provided a cumulative report on the project management unit (PMU) expenditures, as summarized in Table 3.

Table 3. PMU cumulative expenditures in the refrigeration servicing sector plan of stage II of the HPMP

Item	Description	Cost (US $)
Sector-specific costs	Project staff	192,112
	Domestic travel	49,031
	International travel	0
	Domestic meeting	30,034
	International meetings	0
	Consulting service	32,530
Sub-total for sector-specific costs		**303,707**
Operations costs	Shared costs (support staff, computers, Internet, printing, office operations and maintenance)	497,940
Total disbursements (2017-2021)		**801,647**

81. UNEP confirmed that there was no overlap in the funding provided for the institutional strengthening project and the awareness and outreach activities being implemented under the refrigeration servicing sector plan.

Conclusion

82. The Government of China remains in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the refrigeration servicing sector. Activities are progressing well and the overall disbursement rate is at 67 per cent; consumption of 2,982.81 ODP tonnes of HCFCs in the refrigeration servicing sector in 2021 confirms that the Government has met its commitment to reduce HCFC consumption for the refrigeration servicing sector by 734 ODP tonnes in 2020 (i.e., from the 2015 consumption of 3,734 ODP tonnes, to the 2020 target consumption for the refrigeration servicing sector of 3,000 ODP tonnes), this consumption was maintained in 2021. The reduction that has been achieved so far will be sustained through the enforcement of the quota management system for HCFC production and consumption, and the training programmes and technical assistance activities in the refrigeration servicing sector under implementation.

RECOMMENDATION

83. The Executive Committee may wish to consider:

(a) Noting the progress report on the implementation of the fourth tranche of the refrigeration and air-conditioning servicing sector plan and the national enabling programme of stage II of the HCFC phase-out management plan (HPMP) for China; and

(b) Approving the fifth tranche of the refrigeration and air-conditioning servicing sector plan and the national enabling programme of stage II of the HPMP for China, and the corresponding 2022-2023 tranche implementation plan, in the amount of US $2,221,403, consisting of US $1,780,000, plus agency support costs of US $195,325 for UNEP and US $220,000, plus agency support costs of US $26,078 for the Government of Germany.

Annex I

BACKGROUND OF STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN FOR CHINA (76th to 83rd MEETINGS)

76th meeting

1. At its 76th meeting, the Executive Committee approved in principle:

   (a) The solvent sector plan for the period 2016 to 2026, for the complete phase-out of all HCFCs in that sector, in the amount of US $44.8 million, plus agency support costs; and

   (b) The refrigeration servicing sector and enabling programme component for the period 2016 to 2020, to reduce HCFC consumption by 734.0 ODP tonnes in that sector, in the amount of US $20.29 million, plus agency support costs.

77th meeting

2. At its 77th meeting, the Executive Committee approved in principle stage II of the HCFC phase-out management plan (HPMP) for China for the period 2016 to 2026 in the amount of US $500,100,000, plus agency support costs, to reduce HCFC consumption by 37.6 per cent of the baseline by 2020. Stage II included the following sector plans:

   (a) The industrial and commercial refrigeration and air-conditioning (ICR) sector plan to reduce HCFC consumption in the sector by 33 per cent by 2020;

   (b) The room air-conditioning manufacturing and heat pump water heaters (HPWH) (RAC) sector plan to reduce HCFC consumption in the sector by 45 per cent by 2020;

   (c) The polyurethane rigid (PU) foam sector and the extruded polystyrene (XPS) foam sector plans to achieve the total phase-out of HCFCs in these sectors by 2026; and

   (d) The refrigeration and air-conditioning servicing sector and the national enabling programme and the solvent sector plans, approved at the 76th meeting, were components of stage II of the HPMP.

79th meeting

3. At its 79th meeting, the Executive Committee approved the Agreement between the Government of China and the Executive Committee for the implementation of stage II of the HPMP, and set the agency support costs for UNDP, UNIDO, and the World Bank at 6.5 per cent, on the understanding that the agency support costs could be reconsidered at the 81st meeting, and maintained the level of agency support costs for the bilateral agencies and UNEP in place under the current administrative cost regime.

80th and 81st meetings

4. At the 80th and 81st meetings, the Executive Committee approved the second tranches for all except the PU foam sector plans.

82nd meeting

5. At the 82nd meeting, on behalf of the Government of China, UNDP, UNEP, UNIDO, the World Bank and the Governments of Germany and Japan submitted requests amounting to US $29,199,492[26] for the second tranche of the PU foam sector plan (US $10,600,000), and the third tranches of the XPS foam (US $8,000,000), ICR (US $12,000,000), solvent (US $5,549,492), and refrigeration servicing (US $3,850,000) sector plans of stage II of the HPMP. The submission also included an independent verification of HCFC production and consumption in 2017 (submitted by the World Bank); annual implementation reports covering the activities undertaken so far, and annual implementation plans for the activities to be implemented in 2018-2019.

6. After reviewing the documents associated with the third tranche requests for the XPS foam, ICR, solvent and refrigeration servicing sector plans, the Secretariat concluded that all of them had merits to warrant their submission for consideration at the 82nd meeting. However, this was not the case for the second tranche of the PU foam sector plan, as no disbursements from the first tranche had taken place at the time of submission.

7. In discussing the tranche requests, several Committee members expressed serious concern at approving additional funding at that meeting given the unexplained emissions of trichlorofluoromethane (CFC-11) that were reported in East Asia. Pursuant to decision XXX/3 regarding these unexpected emissions, more information had been requested on their cause, and it was suggested that the funding request be deferred until a subsequent meeting when more information was available. At the time, the Foreign Environmental Cooperation Centre (FECO) still held over US $100 million that had not yet been disbursed to beneficiary enterprises; thus, it was considered that deferring the funding requests should have no significant effect. It was important to demonstrate to the international community that the Multilateral Fund took the issue of the illegal emission of CFC-11 seriously, but any decision to defer the funding should be without prejudice to any further actions to be taken by the Government of China.

8. Other members said that care needed to be taken, and that any decision to defer the funding requested should not put into jeopardy the 2020 reduction target for China. It was asked whether all funds had already been transferred to FECO or whether some of them remained with the implementing agencies, and what the effect on them might be if the present request for funding was deferred. The ongoing investigations into the cause of the emissions of CFC-11 meant that the Executive Committee needed to be cautious when reaching conclusions. It could take several years for all the relevant information to be assembled, and it was important to have clarity on what information was required and a timeline for assembling it.

9. Subsequent to deliberations on the issue in the contact group, the Committee decided (decision 82/71):

(a) To request the Government of China, through the relevant implementing agency, to submit at the 83rd meeting:

(i) A review of the current monitoring, reporting, verification and enforcement systems in line with its Agreements with the Executive Committee on the country's HPMP and HCFC production phase-out management plan, including information on the organizational structure and capacity at the national and local levels that demonstrated how the long-term sustainability of the phase-out of HCFCs in the consumption and production sectors was being ensured and on the efforts to

[26] The request for the third tranche of the RAC sector plan (US $18,000,000) was not submitted because the level of disbursement of funds approved for the second tranche had not reached 20 per cent.

address any illegal trade in those substances; and

(ii) A progress report regarding actions taken with a view to strengthening of legislation on ODS and implementation thereof in China; and

(b) To consider the requests for funding for the subsequent tranches of stage II at the 83rd meeting.

83rd meeting

10. In response to decision 82/71, UNDP also submitted, on behalf of the Government of China, the report of the current monitoring, reporting, verification and enforcement systems and the progress report regarding actions taken with a view to strengthening of legislation on ozone-depleting substances (ODS).[27] In addition, UNDP, UNEP, UNIDO, the World Bank and the Governments of Germany and Japan re-submitted requests for third tranches of the XPS foam, ICR, solvent and refrigeration servicing sector plans and for second tranche of the PU foam sector plan associated with stage II of the HPMP for China.

11. After reviewing the re-submission of the sector plans and associated documents, the Secretariat concluded that all of them merited consideration at the 83rd meeting, except the request for the second tranche of the PU foam sector plan, which did not meet the disbursement requirements; accordingly, this tranche request was not submitted.

12. In discussing the tranche requests, one Executive Committee member said that in light of the matter of the substantial increase in CFC-11 emissions from China, her delegation had concerns about the sustainability of reductions in ODS achieved using funding from the Fund, and was unable, at the present time, to support project funding for China; she further noted that there may need to be restitution for the environmental harm caused by the unexpected emissions. Another representative supported that stance, stating that until the matter had been clarified, his country was unable to approve new tranches for the HPMP, as that would undermine the credibility of the Montreal Protocol.

13. Following the discussion, the Executive Committee deferred, to the 84th meeting, consideration of the revision of the Agreement for stage II of the HPMP for China and the requests for the third tranches of the XPS foam, ICR, refrigeration servicing, and solvent sector plans under stage II of the HPMP (decision 83/55).

[27] UNEP/OzL.Pro/ExCom/83/11/Add.1

Annex II

FINANCIAL REPORT OF THE PROJECT MANAGEMENT UNIT ASSOCIATED WITH THE SECTOR PLANS OF STAGE I AND STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN AND HCFC PRODUCTION PHASE-OUT MANAGEMENT PLAN FOR CHINA

Stage I: cumulative project management unit (PMU) expenditure as of 31 December 2021 (US $)

Item	Sectors *						
	Production	**RAC**	**PU Foam**	**XPS Foam**	**ICR**	**Solvent**	**Servicing**
Sector costs							**11,324,644**
Project staff	1,768,942	1,770,161	1,590,980	1,199,717	1,737,143	235,859	260,452
Domestic travel	199,305	193,788	209,875	161,437	212,939	13,589	25,789
International travel	24,000	20,000	18,653	16,000	20,000	4,000	4,309
Domestic meeting **	176,004	153,157	170,391	130,008	172,076	12,000	20,382
International meetings	0	0	0	0	0	0	0
Consulting service ***	159,479	149,625	167,581	128,880	166,670	10,874	20,579
Sub-total sector costs	2,327,730	2,286,731	2,157,480	1,636,042	2,308,828	276,322	331,511
Share costs							**12,568,015**
Supporting staff ****							6,659,931
Computer, Internet, phone, printing, etc.							1,600,418
Office operation and maintenance, utilities							4,307,666
Total	**4,889,411**	**4,620,495**	**4,749,869**	**3,622,688**	**4,913,058**	**450,982**	**646,156**

Note: Total cumulative expenditure of the PMU in the implementation of stage I of the HPMP in 2011-2021 was US $23,892,659, comprising US $18,948,018 from the HPMP sector plans and US $4,944,641 from other individual projects or the Foreign Environmental Cooperation Centre's own budget. Expenditures for institutional strengthening and co-financing by the Government of China (about US $4.01 million in 2011-2021) are not included.

* PU = polyurethane; XPS = extruded polystyrene; RAC = room air-conditioning manufacturing and heat pump water heaters; ICR = industrial and commercial refrigeration and air-conditioning.

** Costs for venue, equipment rental and others.

*** Consulting institutions and experts hired for project evaluation, financial and technical verifications, technical review, bidding evaluations, technical support, etc.; contractual staff hired to help with high workload or special events, such as meetings, exhibitions and workshops, as well as translation-related costs.

**** Costs associated with the apportioned supporting staff in the financial division, contract management, general affairs, and other relevant divisions.

Stage II: Cumulative PMU expenditure as of 31 December 2021 (US $)

Item	Sectors*						
	Production	**RAC**	**PU foam**	**XPS foam**	**ICR**	**Solvent**	**Servicing**
Sector costs							7,543,609
Project staff	1,448,396	1,120,295	1,181,458	890,770	1,162,750	192,112	192,112
Domestic travel	114,589	56,766	72,585	111,135	128,682	52,133	49,031
International travel	13,305	0	0	3,821	4,000	0	0
Domestic meeting**	68,424	36,085	46,935	68,495	79,310	31,214	30,034
International meetings	0	0	0	0	0	0	0
Consulting service***	75,129	38,324	49,406	73,942	85,620	34,221	32,530
Sub-total for sector costs	1,719,843	1,251,470	1,350,384	1,148,163	1,460,362	309,680	303,707
Share costs							5,962,015
Supporting staff****							3,713,505
Computer, internet, phone, printing, etc.							664,222
Office operation and maintenance, utilities							1,584,288
Total	**2,865,900**	**1,841,033**	**2,112,174**	**2,280,947**	**2,772,005**	**831,918**	**801,647**

Note: Total cumulative expenditure of the PMU in the implementation of stage II of the HPMP in 2017-2021 was US $13,505,624, comprising US $6,819,620 from the HPMP sector plans and US $6,686,004 temporarily covered by the Foreign Environmental Cooperation Centre's budget, to be reimbursed by the implementing agencies from PMU costs for future tranches. Expenditures for institutional strengthening and co-financing by the Government of China are not included.

* PU = polyurethane; XPS = extruded polystyrene; RAC = room air-conditioning manufacturing and heat pump water heaters; ICR = industrial and commercial refrigeration and air-conditioning.

** Costs for venue, equipment rental and others.

*** Consulting institutions and experts hired for project evaluation, financial and technical verifications, technical review, bidding evaluations, technical support, etc.; contractual staff hired to help with high workload or special events, such as meetings, exhibitions and workshops, as well as translation-related costs.

**** Costs associated with the apportioned supporting staff in the financial division, contract management, general affairs, and other relevant divisions.