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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-seventh Meeting
Montreal, 1–5 December 2025
Item 9(d) of the provisional agenda¹

PROJECT PROPOSALS: CHINA

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

Phase-out

HCFC phase-out management plan (stage II):

Individual consideration

- | | |
|---|--------------------------|
| • Extruded polystyrene foam sector plan – eighth tranche | UNIDO and Germany |
| • Polyurethane foam sector plan – sixth tranche | World Bank |
| • Industrial and commercial refrigeration and air-conditioning sector plan – sixth tranche | UNDP |
| • Room air-conditioning manufacturing and heat pump water heaters sector plan – fifth tranche | UNIDO, Austria and Italy |
| • Solvent sector plan – seventh tranche | UNDP |
| • Refrigeration and air-conditioning servicing sector plan and the national enabling programme – eighth tranche | UNEP, Germany and Japan |

¹ UNEP/OzL.Pro/ExCom/97/1

Overarching strategy for stage II of the HCFC phase-out management plan for China

Note by the Secretariat

Background

1. At its 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 for the period 2016-2026, as per the Agreement for stage II of the HPMP approved at the 79th meeting, 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)):

- (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 subparagraph (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;
 - c) Tonnages associated with lines 4.1.1 to 4.6.3 to reflect the information in subparagraph (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 subparagraph (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 subparagraphs (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 implementing agencies submitted the revised plans of action for all sectors under stage II, addressing all elements of decision 84/69, including HCFC phase-out targets from 2021 to 2026, related activities, information on selected technologies, associated funding tranches, and a draft revised Agreement. The Executive Committee noted the revised sector plans and approved the revised Agreement for stage II of the HPMP (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. 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 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

8. At the 91st meeting, the Executive Committee approved² the requests for the fifth tranches of sector plans for XPS foam, solvent, and refrigeration and air-conditioning servicing and the national enabling programme,³ and at the 93rd meeting, the Executive Committee approved the requests for the sixth tranches of the XPS foam, solvent and refrigeration servicing sector plans, and for the fourth and fifth tranche, respectively, of the PU foam and ICR sector plans.⁴ At the 94th meeting, the Executive Committee approved the request for the fourth tranche of the RAC sector plan, on the understanding that UNIDO and the Government of Austria would not transfer any of the approved funds to the Foreign Environmental Cooperation Centre (FECO) of the Government of China until the Executive Committee had considered the report, to be submitted by UNDP, referred to in decision 94/11(b)(ii); that any unused incremental operating costs from stage II of the HPMP RAC sector plan would be returned to the Multilateral Fund taking into account sales of split R-290-based air-conditioning (AC) units that had taken place before

² Decisions 91/50 to 91/52

³ 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.

⁴ Decisions 93/49 to 93/53

31 December 2026; and that UNIDO would submit, to the 97th meeting, an update on consideration by the Government of China of the suggestions to facilitate the manufacturing of R-290 split AC units described in paragraph 32 of document UNEP/OzL.Pro/ExCom/94/29.⁵ At the 95th meeting, the Executive Committee approved the request for the seventh tranches of the XPS foam and refrigeration servicing sector plans and the fifth tranche of the PU foam sector plan.

Submission to the 97th meeting

9. Relevant bilateral and implementing agencies submitted requests for the following sector plans: XPS foam and servicing (eighth tranche), PU foam and ICR (sixth tranche), RAC (fifth tranche), and solvent (seventh tranche). 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 sector plans under stage II of the HPMP (US \$)

Sector plan	Lead and cooperating agencies	Funding approved	Funding requested
XPS foam	UNIDO, Germany	37,405,298	4,000,000
PU foam	World Bank	19,112,039	5,000,000
ICR	UNDP	52,464,531	7,559,464
RAC	UNIDO, Austria, Italy	43,062,981	8,717,105
Solvent	UNDP	25,045,909	523,431
Servicing	UNEP, Germany, Japan	16,329,132	1,200,000
Total		193,419,890	27,000,000

Status of ratification of the Kigali Amendment

10. 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 regulations with the purpose of including HFCs in its jurisdictional scope and further enhancing liability for engaging in illegal activities involving controlled substances. On 29 September 2021, the Ministry of Ecology and the Environment (MEE), the National Development and Reform Commission and the Ministry of Industry and Information Technology jointly issued an updated Catalogue of Controlled Ozone-Depleting Substances (ODSs) in China, including HFCs in its scope. Since 1 November 2021, the import and export license management system has applied to substances listed in the revised Catalogue, including HFCs.

HCFC consumption

11. The Government of China reported HCFC consumption for 2024 under Article 7 of the Montreal Protocol as shown in table 4.

Table 4. HCFC consumption in China from 2020 to 2024 (Article 7 data)

Year	2020	2021	2022	2023	2024	Starting point
Metric tonnes						
HCFC-22	133,450	127,809	134,065	110,634	110,311	209,006
HCFC-123	868	946	952	788	*429	507
HCFC-124	(23)	(32)	22	(17)	*3	140
HCFC-133/133a	(18)	0	0	0	0	0

⁵ Decision 94/34

Year	2020	2021	2022	2023	2024	Starting point
HCFC-141b	28,976	25,276	27,796	9,773	10,579	53,502
HCFC-142b	2,149	4,617	1,949	2,853	3,551	22,624
HCFC-225ca/cb	0	0	0	0	0	17
Total	165,403	158,617	164,784	124,030	124,866	285,796
ODP tonnes						
HCFC-22	7,339.77	7,029.52	7,373.58	6,084.88	6,067.10	11,495
HCFC-123	17.36	18.93	19.03	15.76	8.57	10
HCFC-124	(0.51)	(0.70)	0.48	(0.38)	(0.07)	3
HCFC-133/133a	(1.08)	0	0	0	0	0
HCFC-141b	3,187.41	2,780.30	3,057.54	1,075.03	1,163.69	5,885
HCFC-142b	139.71	300.13	126.71	185.41	230.79	1,471
HCFC-225ca/cb	0	0	0	0	0	1
Total	10,682.65	10,128.19	10,577.33	7,360.70	7,470.07	18,865

*The amounts of HCFC-123 and HCFC-124 in 2024 appeared as HCFC-123a and HCFC-124a under the Article 7 report. However, it is confirmed that these amounts correspond to HCFC-123 and HCFC-124, as also reported under the CP implementation report.

12. HCFC consumption in China continues to be dominated by three substances: HCFC-22, HCFC-141b and HCFC-142b, which collectively account for 99.7 per cent of the country's consumption expressed in ODP tonnes. The overall HCFC consumption in ODP tonnes in 2024 was slightly higher than in 2023, but below the reduction target established by the Montreal Protocol and the maximum allowable consumption stated in the Agreement with the Executive Committee for that year. Sectoral reductions in HCFC consumption are discussed in detail in the progress reports on the implementation of respective sector plans contained in the present document.

13. The Government has reported the country programme (CP) data for 2024. Table 5 presents the country's HCFC consumption per sector, confirming compliance with consumption limits for the manufacturing sector 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 for stage II of the HPMP.

Table 5. HCFC consumption per sector in China in 2024 (CP data) (ODP tonnes)

Substance	XPS foam	PU foam	ICR*	RAC*	Solvent	Servicing
HCFC-22	605.00		1,320.00	1,375.00		2,767.10
HCFC-141b		1,042.69			121.00	
HCFC-142b	97.50		3.57			129.71
HCFC-123			7.02			1.56
HCFC-124						-0.07
Total	702.50	1,042.69	1,330.59	1,375.00	121.00	2,898.30
Maximum allowable consumption	762.0	1,078.4	1,369.6	1,614.1	148.3	n/a

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

14. The Government of China continues to monitor HCFC consumption in each sector. Every year, 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 metric tonnes (mt) of HCFCs.

15. In cooperation with the local ecology and environment bureaus (EEBs), FECO continues to strengthen policies to support reductions in HCFC consumption, and the MEE oversees quota management while strengthening relevant control measures regarding HCFC production and consumption, including three bans on HCFC consumption issued in 2023 for three subsectors: pipelines, solar energy water heaters of the PU foam sector, and medical solvents. The MEE, jointly with the Ministry of Industry and Information Technology, has also issued a catalogue of recommended alternatives to ODSs to promote conversion and transformation in different sectors.

16. A revision of the Regulation on the Administration of ODSs entered into force on 1 March 2024, including further enhancement of the quota and licensing registration system; further strengthening of the legal responsibility (for ODSs as by-products during the production process should be disposed in an environmentally sound manner and not directly discharged); and specified more severe penalties for illegal acts. In February 2024, MEE issued a Notice on the Promotion and Implementation of the Revised Regulation on the Administration of ODSs, requiring local EEBs to attach great importance and take comprehensive measures to fully implement the revised Regulation. In April 2025, the State Council approved the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025–2030), which outlines the roadmap for the complete phase-out of HCFCs by 2030 and sets a target for a 10 per cent reduction of HFCs by 2029.

Verification of consumption of HCFCs in China

17. The World Bank commissioned an independent verification of the 2024 HCFC production and consumption figures in China, which confirmed that the consumption reported for 2024 was within the limits established by the Agreement. At the time of finalization of the present document, the Secretariat had not yet completed the review of the verification report, including whether based on the verification report any revisions might be needed to the data submitted under Article 7 of the Montreal Protocol and the CP data report.

Verification of the manufacturing sector conversions

18. UNDP, UNIDO and World Bank submitted technical reports to verify conversions completed in the XPS foam, PU foam, RAC, ICR and solvent sectors in 2024, in line with subparagraph 5(c) of the Agreement. An overview of verifications by sector is shown in table 6.

Table 6. Verified phase-out of HCFCs by sector achieved in 2024 through funded conversions

Sector	Number of lines and enterprises	Verified phase-out of HCFCs	
		mt	%
XPS foam	6 lines at 3 enterprises	1,129.00	100
PU foam	6 lines at 2 enterprises	170.63	100
RAC	4 lines at 3 enterprises	2,619.15	100
ICR	1 line at 1 enterprise	237.04	43
Solvent	27 lines at 2 enterprises	52.31	14

Progress overview of the implementation of stage II of the HCFC phase-out management plan

19. 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. Out of the 21 beneficiary enterprises, 14 have completed conversions to carbon dioxide (CO₂) and other co-blowing agents with low global-warming potential (GWP), phasing out 5,733 mt or 321.59 ODP tonnes of HCFCs; three enterprises with total HCFC consumption of 937 mt (51.64 ODP tonnes) completed trial production and installed new equipment; two additional enterprises have received equipment and stopped using HCFCs; and the last two are set to reach this milestone by the end of 2025, with project acceptance, final payments and closure planned for 2026. Several technical assistance activities including training, development of standards and research on optimization of CO₂-based technology have also been completed to support the sector's transition to low-GWP technologies. Regulations to prohibit the use of HCFCs in the XPS foam sector will be implemented from 2026;
- (c) *PU foam sector:* The contract between FECO and the World Bank was signed in January 2019; since then, 46 individual enterprises and systems houses have signed conversion contracts with FECO. Of those, 23 individual beneficiaries have completed conversions to HC, HFO or water-based technology, phasing out 2,234 mt (245.72 ODP tonnes) of HCFC-141b. The remaining eight enterprises and 15 systems houses using 6,308 mt (693.92 ODP tonnes) of HCFC-141b are in the process of procuring equipment and material and are set to complete their conversions by the end of 2025 (individual enterprises) or in the first half of 2026 (systems houses and associated downstream users). Several technical assistance activities including training, research on alternative technologies for specific applications, and capacity building for the enforcement of regulations have also been completed to support the sector's transition to low-GWP technologies. A ban on the consumption of HCFC-141b as a foaming agent will become effective for all subsectors except spray foam on 1 January 2026, and on 1 July 2026 for the latter subsector;
- (d) *ICR sector:* A total of 19 enterprises have signed contracts for converting 29 manufacturing lines to phase out 3,584.13 mt of HCFC-22; of those, 18 lines have completed national acceptance and phased out 2,558.73 mt of HCFC-22, four lines have completed the design and procurement contracts, and seven lines with signed contracts started to carry out the project design and procurement contracts. Several technical assistance activities have also been completed to support the sector's transition to non-HCFC technologies;
- (e) *RAC manufacturing sector:* The conversion of nine RAC manufacturing lines at eight enterprises, with an aggregated consumption of 4,117.31 mt (226.45 ODP tonnes) of HCFC-22, and four compressor manufacturers to be converted under the first to third tranches have been completed, enabling manufacturing with R-290. Manufacturing lines at a further three RAC enterprises and five manufacturers of heat pumps and water heaters (HPWH), with an aggregated consumption of 1,189.13 mt (65.40 ODP tonnes) of HCFC-22, were verified as eligible for participation under the fourth tranche; of these, one RAC enterprise (one line) and one HPWH enterprise (one line plus an additional six lines) have completed conversions using their own funding, five enterprises have signed agreements and are at various stages of implementation, and one HPWP manufacturer withdrew from the project. For technical assistance activities, 10 out of 13 research and development projects for the introduction of R-290 technology have been completed, with results shared through a workshop, and additional three projects were launched under the fourth tranche; several standards on appliances and safety were revised and are in the process of being approved; and events continued to take place to share lessons learned on R-290 RAC technology with other Article 5 countries;

- (f) *Solvent sector*: FECO signed contracts with four additional enterprises for phasing out 141.91 mt (15.6 ODP tonnes) of HCFC-141b; of these, three have completed conversions and one is set to complete it by the first quarter of 2026. Regulations to prohibit the use of HCFCs in the solvent sector will be implemented from 1 July 2026. Capacity-building activities, training, technology outreach on the adoption of alternatives to HCFCs, and targeted programmes to strengthen the local EEBs continue to be implemented; and
- (g) *Refrigeration servicing sector*: The seventh tranche agreement between FECO and UNEP was signed in June 2025. The development of standards for water chillers and multi-split air conditioners will be completed by industry associations, while related HPMP funds will instead support a study and development of standards for refrigerant reclamation traceability and a study on leakage prevention standards, initiated through a contract signed in July 2025. In the cold chain sector, FECO introduced national control measures on refrigerants and promoted energy-efficient, environmentally friendly alternatives at industry meetings; and sectoral surveys continued, resulting in an initiative to standardize equipment nomenclature for cold storage and commercial refrigeration. Over 600 participants attended workshops on ODS phase-out management and import/export control, and capacity-building programmes at six selected EEBs continued. The newly established law enforcement cooperation centre for combating illegal trade in ODSs has analyzed smuggling trends, led investigations, and supported enterprise assessments. The commercial refrigeration after-sales programme provided training to 469 participants (including 22 women) from 255 SMEs; a third batch of beneficiaries in the “pilot cities” project began implementing local capacity-building initiatives; and general promotional activities have continued.

Disbursement of funds

20. As of October 2025, of the US \$193,419,890 approved so far for all sector plans of stage II of the HPMP for China, US \$160,227,387 (83 per cent) had been disbursed from implementing agencies to FECO, and FECO had disbursed US \$153,455,836 (79 per cent) to beneficiaries,⁶ as shown in table 7.

Table 7. Disbursement by sector under stage II of the HPMP for China (as of October 2024)

Sector / agency		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Tranche 5	Tranche 6	Tranche 7	Total
XPS foam (UNIDO/Germany)									
Approved (US \$)		7,514,867	9,000,000	9,890,431	5,000,000	2,000,000	3,000,000	1,000,000	37,405,298
Disbursed from IAs to FECO	Amount (US \$)	7,514,867	9,000,000	9,890,431	4,219,286	1,800,000	2,700,000	300,000	35,424,584
	Ratio (%)	100	100	100	84	90	90	30	95
Disbursed by FECO to benefic.	Amount (US \$)	7,401,948	9,000,000	9,890,431	3,537,697	660,676	2,073,108	300,000	32,863,860
	Ratio (%)	98	100	100	71	33	69	30	88
PU foam (World Bank)									
Approved (US \$)		7,045,027	2,067,012	4,000,000	5,000,000	1,000,000			19,112,039
Disbursed from IA to FECO	Amount (US \$)	7,045,027	2,067,012	4,000,000	4,000,000	500,000			17,612,039
	Ratio (%)	100	100	100	80	50			92

⁶ 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); completion of prototype manufacture, conversion of lines and performance test (30 per cent); and trial production, training, and equipment disposal upon project acceptance (20 per cent).

Sector / agency		Tranche 1	Tranche 2	Tranche 3	Tranche 4	Tranche 5	Tranche 6	Tranche 7	Total
Disbursed by FECO to benefic.	Amount (US \$)	7,045,027	2,067,012	4,000,000	2,370,826	242,727			15,725,592
	Ratio (%)	100	100	100	47	24			82
ICR (UNDP)									
Approved (US \$)		13,368,756	20,000,000	2,095,775	9,000,000	8,000,000			52,464,531
Disbursed from IA to FECO ^[1]	Amount (US \$)	13,298,756	19,775,000	2,095,775	8,954,000	2,005,457			46,128,988
	Ratio (%)	99	99	100	99	25			88
Disbursed by FECO to benefic.	Amount (US \$)	13,298,756	19,775,000	2,095,775	5,999,496	1,651,830			42,820,857
	Ratio (%)	99	99	100	67	21			82
RAC (UNIDO/Austria/Italy)									
Approved (US \$)		15,562,981	16,000,000	4,500,000	7,000,000				43,062,981
Disbursed from IAs to FECO	Amount (US \$)	13,127,000	7,923,936	2,032,082	2,317,411				25,400,429
	Ratio (%)	84	49	45	33				59
Disbursed by FECO to benefic. ^[2]	Amount (US \$)	13,399,534	8,878,758	3,772,522	2,034,735				28,085,549
	Ratio (%)	86	55	84	29				65
Solvent (UNDP)									
Approved (US \$)		2,821,937	3,777,190	12,946,782	2,500,000	1,000,000	2,000,000		25,045,909
Disbursed from IA to FECO	Amount (US \$)	2,796,937	3,742,190	12,946,782	2,466,000	979,000	982,000		23,912,909
	Ratio (%)	99	99	100	99	98	49		95
Disbursed by FECO to benefic.	Amount (US \$)	2,796,937	^[3] 3,742,190	12,946,782	2,141,265	614,207	837,148		23,078,529
	Ratio (%)	99	99	100	86	61	42		92
Servicing (UNEP/Germany/Japan)^[4]									
Approved (US \$)		3,679,132	2,650,000	1,000,000	2,000,000	2,000,000	2,000,000	3,000,000	16,329,132
Disbursed from IAs to FECO ^[5]	Amount (US \$)	3,678,438	2,640,000	950,000	1,700,000	1,100,000	1,030,000	650,000	11,748,438
	Ratio (%)	100	100	95	85	55	51	22	72
Disbursed by FECO to benefic.	Amount (US \$)	3,678,438	^[6] 2,650,000	^[6] 989,840	1,393,489	1,021,515	534,660	613,507	10,881,449
	Ratio (%)	100	100	99	70	51	27	20	67
TOTAL funding for all sectors									
Approved by ExCom (US \$)		49,992,700	53,494,202	34,432,988	30,500,000	14,000,000	7,000,000	4,000,000	193,419,890
Disbursed from IAs to FECO	Amount (US \$)	47,461,025	45,148,138	31,915,070	23,656,697	6,384,457	4,712,000	950,000	160,227,387
	Ratio (%)	95	84	93	78	46	67	24	83
Disbursed by FECO to benefic.	Amount (US \$)	47,620,640	46,112,960	33,695,350	17,477,508	4,190,955	3,444,916	913,507	153,455,836
	Ratio (%)	95	86	98	57	30	49	23	79

^[1] Interest accrued from the funds held by FECO of US \$103,708, US \$97,468, US \$99,480, US \$159,433, and US \$22,240 for the period 2015-2023 was deducted from the approved funds before transfer.

^[2] Disbursement from FECO to beneficiaries is higher than from UNIDO to FECO given disbursements by FECO with its own resources. Disbursement does not include US \$25,725 disbursed by the Government of Italy to final beneficiaries.

^[3] 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).

^[4] An additional US \$1,000,000 was approved at the 84th meeting.

^[5] Reference for disbursement in the refrigeration servicing sector.

^[6] The disbursement from FECO to beneficiaries for the second and third tranches of the servicing sector plan includes direct disbursement from UNEP to beneficiaries.

21. At the time of submission of the tranche requests (12 weeks prior to the 97th meeting), the rate of fund disbursement from FECO to beneficiaries in all sectors was at or above 20 per cent.

Financial report of the project management unit

22. In line with decision 81/46(b), UNDP submitted the project management unit (PMU) expenditures for stage II of the HPMP as of December 2024, as presented in annex II to the present document.⁷

Report on the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the solvent, extruded polystyrene foam, room air-conditioning manufacturing and heat-pump water heater, and the refrigeration and air-conditioning servicing sectors of the HPMP (decision 94/11(b))

23. At the 94th meeting, the Executive Committee considered the report and the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the HPMP, and requested UNDP to apply to stage II of the ICR sector plan for China, on a trial basis, the overarching principles described in annex VI to the final report to the 94th meeting; and as the lead implementing agency for stage II of the HPMP for China, to coordinate with other implementing agencies and submit a report to the 95th meeting on how to implement the overarching principles in the solvent, XPS foam, RAC manufacturing and refrigeration servicing sector plans.

24. Accordingly, at the 95th meeting, the Executive Committee noted the report submitted by UNDP⁸ and requested UNDP, UNIDO and UNEP, as lead agencies of the relevant sector plans, to apply, on a trial basis, those overarching principles to the ICR, solvent, XPS foam, RAC manufacturing and refrigeration servicing sector plans under stage II of the HPMP (decision 95/43).

25. In advance of the 97th meeting, UNDP, UNIDO and UNEP confirmed that they were applying the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the relevant sector plans, as presented in the stand-alone progress reports by sector contained in the present document (paragraphs 37, 87, 115, 157 and 173).

Disbursement of funds and interest accrued under stage II⁹

26. In line with decision 77/49(b)(iii), information on interest accrued at the end of 2024 from funds previously transferred for the implementation of sector plans was provided through an audit report of disbursements made in all sectors,¹⁰ as shown in table 8. The report indicates that “the financial statement of project grant and disbursement of the HPMP (stage II) complies with the rules of the Montreal Protocol on ODSs and the Chinese Institution Accounting Standards. The statement of project grant and expenditure has been fairly and justly presented in all material respects from 1 January to 31 December 2024 by FECO.”

Table 8. Interest accrued under stage II of the HPMP in China as of 31 December 2024 (US \$)

Sector plan and implementing agencies	Interest accrued in stage II (US \$)
XPS foam (UNIDO/Germany)	1,721

⁷ No PMU expenditures for stage I of the HPMP have been included as stage I had been completed in 2023.

⁸ Annex III of document UNEP/OzL.Pro/ExCom/95/47

⁹ The financial audit report only includes stage II as stage I is already completed.

¹⁰ Submitted by UNDP on 9 October 2024.

Sector plan and implementing agencies	Interest accrued in stage II (US \$)
PU foam (World Bank)	170
ICR (UNDP)	7,244
RAC (UNIDO/Austria/Italy)	14,697
Solvent (UNDP)	4,878
Servicing (UNEP/Germany/Japan)	2,217
Total for all sector plans	30,927

Tranche progress reports and funding requests

27. Detailed stand-alone progress reports on the implementation of sector plans and associated requests for funding are included below the Note by the Secretariat. Each provides a report on the implementation of the ongoing tranche and a level of fund disbursement, an implementation plan for the next tranche, comments by the Fund Secretariat, and a recommendation.

28. The Secretariat notes that the Government of China has been in compliance 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

29. The Executive Committee may wish, with regard to the interest accrued by the Government of China up to 31 December 2024 on funds previously transferred for the implementation of sector plans under stage II of the HCFC phase-out management plan (HPMP), as per decision 77/49(b)(iii), to request the Treasurer:

- (a) To offset future transfers to UNIDO by US \$1,721, 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 UNIDO by US \$170, 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 \$7,244, representing interest accrued from funds previously transferred for the implementation of the industrial and commercial refrigeration sector plan under stage II of the HPMP;
- (d) To offset future transfers to UNIDO by US \$14,697, representing interest accrued from funds previously transferred for the implementation of the room air-conditioning manufacturing and heat-pump water heater sector plan under stage II of the HPMP;
- (e) To offset future transfers to UNDP by US \$4,878, 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 \$2,217, 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	UNIDO (lead) and Germany	Approved: 77 th ; Revised: 86 th	100% phase-out by 2026

(II) LATEST ARTICLE 7 DATA (Annex C, Group I)	Year: 2024	7,487.16 ODP tonnes
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2024
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		605.00	2,695.00	2,767.10		6,067.10
HCFC-123			7.02	1.56		8.57
HCFC-124				-0.07		-0.07
HCFC-141b		1,042.69			121.00	1,163.69
HCFC-142b		97.50	3.58	129.71		230.79

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

(V) ENDORSED BUSINESS PLAN		2025	2026	2027	Total
UNIDO	ODS phase-out (ODP tonnes)	203.47	179.80	0.0	434.14
	Funding (US \$)	4,280,000	3,782,080	0	9,132,080

(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	0	267,386	0	0	600,000	0	0	0	0	0	867,386
		Support costs	0	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	2,000,000	3,000,000	1,000,000		0	37,405,298
		Support costs	526,041	599,497	0	692,330	381,535	140,000	210,000	70,000		0	2,619,403
Total funds recommended for approval at this meeting (US \$)		Project costs									4,000,000		4,000,000
		Support costs									280,000		280,000

* 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 as approved at the 86th meeting in line with decision 86/34.

Secretariat's recommendation:	Individual consideration
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PROJECT DESCRIPTION

30. On behalf of the Government of China, UNIDO as the lead implementing agency has submitted a request for funding for the eighth tranche of the extruded polystyrene (XPS) foam sector plan of stage II of the HCFC phase-out management plan (HPMP), in the amount of US \$4,000,000, plus agency support costs of US \$280,000, for UNIDO only.¹ The submission includes a progress report on the implementation of the seventh tranche of the XPS foam sector plan, the tranche implementation plan for 2026, and verification reports, in line with subparagraph 5(c) of the Agreement between the Government of China and the Executive Committee.

31. This submission is based on the revised plan of action for the XPS foam sector for the period 2021-2026 in 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 (decisions 86/34 and 86/38).

32. 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 alternatives with low global-warming potential (GWP), 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 was to be phased out by non-assisted enterprises. The revised plan approved in 2020 sets out to directly assist 21 enterprises in phasing out 466.32 ODP tonnes of HCFCs, 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 in the implementation of the seventh tranche of stage II of extruded polystyrene foam sector plan

Investment activities

33. 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. Fourteen enterprises have already completed their conversions to carbon dioxide (CO₂) with other low-GWP co-blowing agents,² phasing out 5,733 metric tonnes (mt) or 321.59 ODP tonnes of HCFCs. Three enterprises with a consumption of 937 mt (51.64 ODP tonnes) of HCFCs have completed trial production with the new equipment installed, and the remaining four enterprises are at different stages of implementation, as summarized in table 1. Out of the remaining four enterprises with ongoing conversions, two have already received the equipment and stopped using HCFCs, while the remaining two will receive the equipment and stop using HCFCs by the end of 2025, with project acceptance, final payments and closure planned for 2026.

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

Status of implementation	Number of enterprises	HCFC consumption in 2016*		Value of contracts (US \$)
		mt	ODP tonnes**	
Project completed (passed project acceptance)	14	5,733.05	321.59	30,106,030
Completed trials	3	937.46	51.64	3,962,623
Received equipment	2	952.64	53.80	3,405,280
Equipment procurement completed	2	709.14	39.28	2,917,154
Total	21	8,332.29	466.31	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.

¹ As per the letter of 12 September 2025 from the Ministry of Ecology and the Environment of China to UNIDO.

² Alcohol for XPS board thickness below 60 mm; alcohol and small amounts of HFC-152a (GWP of 124) for XPS board thickness above 60 mm.

Verification of converted manufacturing lines

34. In 2025, in accordance with subparagraph 5(c)³ of the Agreement, UNIDO commissioned the verification of three XPS foam enterprises that had completed conversion to CO₂ in 2025, phasing out 1,129 mt (62.11 ODP tonnes) of HCFCs, which represents 100 per cent of phase-out achieved by assisted enterprises in the sector in 2025. The verification report confirmed that the enterprises had permanently ceased their use of HCFCs in XPS foam manufacturing and started using CO₂ and ethanol in line with the relevant national product standards. The verification also confirmed that the allocation of funds was transparent and within the cost-effectiveness thresholds, and that the replaced baseline equipment was destroyed, in line with the Multilateral Fund requirements.

Technical assistance activities

35. Technical assistance activities implemented over the period 2024–2025 included technical support provided by the implementation support agency (ISA) to FECO and the 10 enterprises with ongoing projects in their day-to-day operations, conversion processes, on-site baseline verifications and promotion of alternative technologies. The Government of Germany has continued to support regular updates of training materials and the organization of targeted training sessions on safety operation for XPS foam enterprises, and to hold working meetings with FECO to identify and address implementation challenges. The development of the “XPS foam for floor heating” standard is expected to be finalized by December 2025, and research to develop the ban on the use of HCFCs in the XPS foam sector continues. The local manufacturer selected to develop thermal bonding technology for the use of small- and medium-sized enterprises (SMEs) in the sector, has submitted the first set of prototype drawings for expert review. The prototype has been completed. In December 2024, a study tour on the use of recycled materials and novel XPS foam applications for buildings was held for five stakeholders who visited foam producers and equipment suppliers in Germany and the Netherlands.

Level of fund disbursement

36. As of September 2025, of the US \$37,405,298 approved so far, US \$32,863,860 (88 per cent) had been disbursed by FECO to beneficiaries, as shown in table 2. The balance of US \$4,541,438 will be disbursed in 2025–2026.

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

Description		Tranche							Total
		First	Second	Third	Fourth	Fifth	Sixth	Seventh	
Funds approved	UNIDO	7,514,867	8,732,614	9,890,431	4,400,000	2,000,000	3,000,000	1,000,000	36,537,912
	Germany	0	267,386	0	600,000	0	0	0	867,386
	Total	7,514,867	9,000,000	9,890,431	5,000,000	2,000,000	3,000,000	1,000,000	37,405,298
Disb. from IAs to FECO	UNIDO	7,514,867	8,732,614	9,890,431	3,960,000	1,800,000	2,700,000	300,000	34,897,912
	Germany*	0	267,386	0	259,286	0	0	0	526,672
	Total	7,514,867	9,000,000	9,890,431	4,219,286	1,800,000	2,700,000	300,000	35,424,584
	Rate (%)	100	100	100	84	90	90	30	95
Disb. from FECO to benefic.	Total	7,401,948	9,000,000	9,890,431	3,537,697	660,676	2,073,108	300,000	32,863,860
	Rate (%)	98	100	100	71	33	69	30	88
Fund balance		112,919	0	0	1,462,303	1,339,324	926,892	700,000	4,541,438

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

³ 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.

37. In line with decision 95/43(b), UNIDO confirmed that it had applied the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the XPS foam sector plan. As shown in table 2 above, the current balance of funds kept by FECO is US \$2,560,724, which represents 7.33 per cent of total funding transferred to FECO by UNIDO. UNIDO will continue to closely monitor disbursements by FECO to beneficiary enterprises before releasing additional funds.

Implementation plan for the eighth tranche of stage II of the extruded polystyrene foam sector plan

38. During the eighth tranche, FECO will continue enforcing quota permits for the XPS foam enterprises consuming more than 100 mt of HCFCs per year while supervising the ongoing conversions to CO₂-based technology at seven enterprises and providing them with technical and safety assistance. The ISA will support the enterprises through day-to-day operational management, supervision, training, guidance in the implementation of activities, facilitating safe conversions, and carrying out verifications.

39. Technical assistance to support conversions includes training on HCFC-related policies, XPS foam technology and safety offered to local environment and ecology bureaus (EEBs) to strengthen their supervisory capacity; monitoring and supervision exercised by FECO and EEBs to prevent the resurgence of HCFC use in XPS foam manufacturing, especially in enterprises that had undergone conversion; finalization of the “XPS foam for floor heating” standard; completion of the development of CO₂-based thermal bonding technology and related training for SMEs manufacturing XPS foam thicker than 60 mm; approval of the ban on the use of HCFCs in XPS foam sector; and consideration of further measures to ensure sustainable HCFC phase-out. Table 3 presents the budget for activities to be carried out under the eighth tranche.

Table 3. Budget for the eighth 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	3,680,000
Technical assistance including ISA's support, supervision, verifications and capacity building for EEBs	100,000
Project monitoring, including:	
- Project and support staff	130,020
- Domestic and international travel (respectively US \$9,900 and US \$1,540)	11,440
- Domestic meetings	8,800
- Consulting services	7,920
- Operating costs: office operation, facilities and equipment, computer, phone, other	61,820
Project monitoring subtotal	220,000
Total	4,000,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Report on HCFC consumption

40. The consumption of HCFCs in the XPS foam manufacturing sector in 2024 amounted to 12,500 mt (702.5 ODP tonnes), which is below the 762 ODP tonnes allowable consumption set out 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		2020	2021	2022	2023	2024
Consumption*	mt	24,500	23,500	24,500	12,500	12,500
	ODP tonnes	1,363	1,318	1,357	702	702
Maximum allowable consumption**	mt	24,296	24,296	24,296	13,252	13,252

Description		2020	2021	2022	2023	2024
	ODP tonnes	1,397	1,397	1,397	762	762
Phase-out targets	mt	11,043	n/a	n/a	11,044	n/a
	ODP tonnes	635	n/a	n/a	635	n/a

* As per the country programme implementation report.

** As per stage II Agreement (2016-2024) approved at the 86th meeting.

41. In 2025, three additional enterprises consuming 62.11 ODP tonnes of HCFCs completed their conversion projects. Additional reductions required to achieve the 2025 target of 165 ODP tonnes will be achieved through the completion of conversion projects in the remaining enterprises and the application of policy measures and regulations supporting HCFC phase-out in the XPS foam sector. The Government continues to implement the quota management system to ensure control over domestic HCFC production, import and export, including quotas required for manufacturing enterprises consuming over 100 mt of HCFCs. The registration of enterprises remains mandatory and EEBs continue exercising their supervisory and monitoring mandate. Technical assistance activities, including the revision of technical standards, provision of training and guides to enterprises, and research on the impact of applying a ban on the use of HCFCs in the XPS foam sector, are intended to strengthen the industry's technical capacity to adopt CO₂-based technology and ensure that further HCFC reductions are achieved and sustained.

Status of progress

42. The Secretariat notes that the investment projects are well advanced, with most enterprises having completed their conversions and the final two expected to receive equipment and phase out HCFCs by the end of 2025. In addition, policy measures and regulations are prompting non-assisted enterprises to transition away from HCFCs. Ongoing technical assistance to help facilitate this shift, particularly for SMEs, includes research on thermal bonding technology, which simplifies CO₂-based technology⁴ and avoids the use of HFC-152a in panels thicker than 60 mm.⁵

43. Providing more detail on the status of this research, UNIDO confirmed that the prototype of heat-bonding equipment and control system were completed, the pilot machine had been assembled, and trial runs were underway. Upon successful completion of the trial runs and production of relevant reports, the technology will be promoted among SMEs through demonstration projects, technical manuals, and training activities, to accelerate its application. UNIDO also informed the Secretariat that additional research on manufacturing process optimization and partial use of recycled resin⁶ had also been initiated, with the objective of reducing the manufacturing cost of CO₂-based XPS foam.

44. Given the planned phase-out of HCFCs in the XPS foam sector by 1 January 2026, the technical assistance component for the eighth tranche includes capacity building for EEBs, and focuses on enforcing the revised regulations, implementing the newly released regulatory documents on controlled substances, and strengthening relevant supportive policies at a local level. The objective is to enhance the understanding of relevant policies, strengthen domestic monitoring and enforcement, support the adoption of alternatives, explore supportive policies, integrate Montreal Protocol implementation into routine local management, and establish a long-term compliance framework.

⁴ Using thermal bonding technology, XPS foam enterprises can continuously produce boards of fixed thickness and bond two or three boards to meet order requirements, eliminating the need for frequent process adjustments.

⁵ CO₂-based technology requires co-blowing with alcohol for panels with thickness below 60 mm, or with alcohol and HFC-152a for panels with thickness above 60 mm.

⁶ As observed during the implementation of the XPS foam sector plan, the manufacturing of CO₂-based XPS foam requires the use of new polystyrene resin, which is more expensive than recycled resin used in the HCFC-based XPS foam.

Project implementation and monitoring

45. As the lead implementing agency for the HPMP in China, UNDP provided a cumulative report on the project management unit (PMU) expenditures, in line with decision 81/46(b). The PMU expenditures related to 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 (2017-2024)

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	1,703,142
	Domestic travel	148,990
	International travel	13,747
	Domestic meetings	108,603
	International meetings	0
	Consulting service	92,023
Subtotal for sector-specific costs		2,066,505
Operational costs	Shared costs (support staff, computers, internet, printing, office operation and maintenance)	1,711,743
Total disbursement		*3,778,248

* Including US \$1,808,121 funded by stage II of the HPMP and US \$1,970,127 co-financed by the Government of China.

Gender policy implementation

46. In line with the Multilateral Fund operational policy on gender mainstreaming (decisions 84/92 and 90/48(c)), the Government of China continues to promote women's participation in the plan through ongoing support for their involvement in training, technical assistance, and expert recruitment. For instance, three women (38 per cent) are part of the Beijing Technology and Business University team reviewing technical standards, three of the five members of the research group on the ban are women, and four of the five participants of a recent study tour organized by FECO and the Government of Germany to visit XPS foam producers and equipment suppliers in the Netherlands and in Germany were women.

Sustainability of the HCFC phase-out and assessment of risks

47. The Secretariat discussed with UNIDO the potential risk of not achieving full HCFC phase-out by 1 January 2026 or an incomplete adoption of low-GWP technologies, particularly due to the large number of SMEs in the sector. UNIDO emphasized that the implementation of quota management in recent years had gradually reduced supply and increased prices of HCFCs, prompting many SMEs to discontinue HCFC use. All reduction targets in the XPS foam sector have been met, and the CO₂-based technology has been widely accepted. Following the ban on HCFCs in the sector, FECO and local EEBs will maintain regular monitoring and supervision in key provinces and cities where XPS foam enterprises are concentrated. The EEBs will conduct regular inspections and spot checks, and any identified violations will be subject to correction actions, penalties and, when necessary, coordinated enforcement with other government departments.

Conclusion

48. 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 2024. Three additional plant conversions were completed in 2025, for a total of 14 enterprises converted to CO₂-based technology under the plan, with an associated phase-out of 5,733 mt (321.59 ODP tonnes) of HCFCs. The verification of three conversions confirmed that the enterprises had permanently ceased using HCFCs in XPS foam manufacturing and started manufacturing using CO₂ and ethanol, in line with the relevant national product standards. A total of 30 per cent of funds approved for the seventh tranche has been disbursed to beneficiary enterprises. Funds from the eighth tranche will be

used to complete the ongoing conversions to low-GWP alternatives in the remaining two enterprises and to continue the implementation of policy-related and technical assistance activities, including *inter alia* training on HCFC-related policies and XPS foam technology and safety aspects offered to EEBs to strengthen their supervisory capacity; monitoring and supervision by FECO and EEBs to prevent the resurgence of HCFC use in XPS foam manufacturing, especially in enterprises that had undergone conversion; finalization of the research on the use of thermal bonding in XPS foam manufacturing; approval of the ban on the use of HCFCs in XPS foam sector; and consideration of further measures to ensure sustainable HCFC phase-out.

RECOMMENDATION

49. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the seventh 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 eighth tranche of the XPS foam sector plan of stage II of the HPMP for China, and the corresponding 2026 tranche implementation plan, in the amount of US \$4,000,000, plus agency support costs of US \$280,000, for UNIDO.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) PU foam sector	World Bank	Approved: 77 th Revised: 86 th	100% phase-out by 2026

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2024	7,487.16 ODP tonnes
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2024
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		605.00	2,695.00	2,767.10		6,067.10
HCFC-123			7.02	1.56		8.57
HCFC-124				-0.07		-0.07
HCFC-141b		1,042.69			121.00	1,163.69
HCFC-142b		97.50	3.58	129.71		230.79

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

(V) ENDORSED BUSINESS PLAN		2025	2026	2027	Total
World Bank	ODS phase-out (ODP tonnes)	785.81	660.08	0.0	1,445.89
	Funding (US \$)	5,350,000	4,494,000	0	9,844,000

(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)			4,449.6	4,449.6	3,774.5	2,965.7	2,965.7	2,965.7	1,078.4	1,078.4	330.0	0.0	n/a
Agreed funding (US \$)**	World Bank	Project costs	7,045,027	0	0	2,067,012	4,000,000	0	5,000,000	1,000,000	5,000,000	4,200,000	28,312,039
		Support costs	493,152	0	0	144,691	280,000	0	350,000	70,000	350,000	294,000	1,981,843
Funds approved by ExCom (US \$)		Project costs	7,045,027	0	0	2,067,012	4,000,000	0	5,000,000	1,000,000		0	19,112,039
		Support costs	493,152	0	0	144,691	280,000	0	350,000	70,000		0	1,337,843
Total funds requested for approval at this meeting (US \$)		Project costs									5,000,000		5,000,000
		Support costs									350,000		350,000

* The second (2017) tranche was submitted to the 84th meeting and deferred for consideration at the 85th meeting (decision 84/69(a)).

** Total adjusted value of stage II of the HPMP for the PU 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
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PROJECT DESCRIPTION

50. On behalf of the Government of China, the World Bank as the designated implementing agency has submitted a request for funding for the sixth tranche of the polyurethane (PU) rigid foam sector plan of stage II of the HCFC phase-out management plan (HPMP), at a total cost of US \$5,000,000, plus agency support costs of US \$350,000.¹ The submission includes a progress report on the implementation of the fifth tranche, the tranche implementation plan for 2026, and verification reports in line with subparagraph 5(c) of the Agreement between the Government of China and the Executive Committee.²

51. This submission is based on the revised plan of action for the PU foam sector for the period 2021-2026 in the total amount of US \$19,200,000, 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 PU foam sector plan is US \$28,312,039, plus agency support costs (decisions 86/34 and 86/39).

52. Stage II of the PU foam sector plan comprises four groups of activities: policy and regulatory interventions, an investment component to assist enterprises with conversions, technical assistance to support the sector's conversion to alternatives with low global-warming potential (GWP), and project management. The investment component proposes to phase out 939.64 ODP tonnes or 8,542.21 metric tonnes (mt) of HCFC-141b through conversions of 31 individual enterprises, and to channel technical assistance activities, including the development of foam-blowing formulations, through 15 systems houses to an estimated 190 downstream users, many of them small- and medium-sized enterprises (SMEs).

Progress report on the implementation of the fifth tranche of stage II of the polyurethane foam plan

Investment activities

53. The contract between the Foreign Environmental Cooperation Centre (FECO) and the World Bank for the implementation of stage II of the PU rigid foam sector plan was signed on 8 January 2019. All 46 beneficiary individual enterprises and systems houses have signed conversion contracts with FECO; of these, 23 individual enterprises have completed conversions. The remaining eight enterprises and 15 systems houses using HCFC-141b are in the process of procuring equipment and material and are set to complete their conversions by the end of 2025 (individual enterprises) or in the first half of 2026 (systems houses and associated downstream users). The status of progress of all conversions is presented in table 1.

Table 1. Conversion progress at PU foam enterprises assisted under the first five tranches of stage I

Status of implementation		Number of enterprises	HCFC consumption in 2016* (mt)	Value of contract (US \$)
Individual enterprises with completed conversions				
Water-based		11	1,172.24	5,169,237
HC		7	727.46	5,271,049
HFO		5	334.12	2,331,093
Subtotal for completed enterprise conversions		23	2,233.82	12,771,379
Individual enterprises with ongoing conversions				
Water-based	Conducting equipment/ material procurement	3	87.81	351,224
HC		2	114.12	684,696
HFO		3	187.39	749,548
Subtotal for ongoing enterprise conversions		8	389.31	1,785,468
Systems houses with ongoing conversions				
Water-based		1	83.50	270,000

¹ As per the letter of 12 September 2025 from the Ministry of Ecology and Environment of China to the World Bank.

² 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.

Status of implementation		Number of enterprises	HCFC consumption in 2016* (mt)	Value of contract (US \$)
Water and HFO	Conducting equipment/ material procurement	11	5,080.07	4,620,000
HFO		3	755.52	900,000
Subtotal for ongoing systems house conversions		15	5,919.09	5,790,000
Total		46	8,542.21	20,346,847

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

Verification of converted manufacturing lines

54. The World Bank submitted verification reports for two PU foam enterprises that converted to hydrofluoroolefins (HFOs), hydrocarbons (HCs), and water-based technology in 2025, with associated phase-out of 170.63 mt (18.77 ODP tonnes) of HCFCs. This represents 100 per cent of the lines that completed conversions in 2025 and 100 per cent of HCFC phase-out for the same period.

55. The verification reports confirmed *inter alia* that the enterprises had permanently ceased using HCFCs in PU foam production and started manufacturing with selected alternative technologies, and that, where relevant, the replaced baseline equipment was destroyed and necessary permits and approvals were obtained from local authorities. The level of funds provided was consistent with the signed contracts and the enterprises co-financed capital and operational costs.

Technical assistance activities

56. In 2025, the implementation support agency (ISA) continued to provide technical assistance to FECO regarding baseline verification of the last group of enterprises and systems houses that entered the plan, project implementation, financial appraisal and performance verifications at enterprises undergoing conversions, and project acceptance workshops for completed conversions. FECO also organized a subproject implementation training meeting for the enterprises and systems houses that had yet to finalize conversions, as well as a workshop to raise the foam enterprises' awareness on the ongoing domestic and global HCFC-141b phase-out, exchange experience gained from the conversions to low-GWP alternatives, and to inform stakeholders about the upcoming bans.

57. In June 2025, Nanjing Forestry University and Zhejiang Huafeng New Materials Co., Ltd began a research study that would result in a pilot demonstration of suitable alternatives to HCFC-141b used in the production of medium- and low-density PU foam shoe soles, where there had been difficulties in substituting HCFC-141b. A report on the shoe sole subsector status was submitted to FECO in July 2025, and research is expected to be completed by the end of 2025.

58. FECO continues to assist the Ministry of Ecology and the Environment (MEE) in enforcing the established policies and regulations on the management of ozone-depleting substances (ODSs), and to enhance the ODS monitoring and management capacity of local ecology and environment bureaus (EEBs). Upon completion of the research study on the impact of issuing a ban on the consumption of HCFC-141b as a foaming agent, the ban has been drafted and presented for stakeholder consultations and is currently undergoing the internal MEE approval process. The ban, initially planned for 1 January 2025, will be issued by the end of 2025, becoming effective for systems houses and all subsectors except spray foam on 1 January 2026, and on 1 July 2026 for the latter subsector.

Monitoring by the local ecology and environment bureaus

59. In line with decision 84/39(c)(iii),³ the Government of China reported through the World Bank that the local EEBs continued to enforce the established policies and regulations on ODS management and

³ The Executive Committee requested the Government of China through the relevant implementing agency to report on the results of the monitoring efforts of local EEBs, including cases where CFC-11 had been detected, in future

registration of HCFC consumers, and to routinely monitor and manage enterprises dealing with ODSs in the regions. Since the submission of the last progress report, no illegal production or consumption of CFC-11 has been found.

Level of fund disbursement

60. As of July 2025, of the US \$19,112,039 approved for the sector so far, US \$17,612,039 had been disbursed by the World Bank to FECO, and US \$15,725,592 (82 per cent of the total funding approved) had been disbursed by FECO to beneficiary enterprises, as shown in table 2. The balance of US \$3,386,447 will be disbursed in 2026 and 2027.

Table 2. Status of disbursements for stage II of the PU foam sector plan (US \$)

Funding tranche	Funds approved	Disbursement from the World Bank to FECO		Disbursement from FECO to beneficiaries		Fund balance
		Amount	Rate (%)	Amount	Rate (%)	
First	7,045,027	7,045,027	100	7,045,027	100	0
Second	2,067,012	2,067,012	100	2,067,012	100	0
Third	4,000,000	4,000,000	100	4,000,000	100	0
Fourth	5,000,000	4,000,000	80	2,370,826	47	2,629,174
Fifth	1,000,000	500,000	50	242,727	24	757,273
Total	19,112,039	17,612,039	92	15,725,592	82	3,386,447

Implementation plan for the sixth tranche of stage II of the polyurethane foam sector plan

61. During the sixth tranche, ISA will continue supporting FECO in overseeing the completion of conversion activities at the remaining eight beneficiary enterprises and 15 systems houses with ongoing projects. In turn, the systems houses will offer guidance, technical and safety training, on-site support, consultations, and subsidized HFO- and water-based polyols to an estimated 190 downstream foam users to adopt these alternatives.

62. FECO will also provide technical support in the form of training, consulting and on-site guidance to enterprises, especially SMEs, to facilitate alternative technology adoption and sustained HCFC phase-out; work with research institutes on studying and optimizing foaming systems with alternative technologies, especially for SMEs; and revise existing standards or formulate new ones for foam products in different applications, taking into account experience gained from the implementation of the sector plan.

63. To ensure compliance with the 2026 target, FECO will continue supporting the MEE in enforcing relevant policies and regulations on ODS management, particularly the upcoming bans on the use of HCFC-141b in PU foam, all the while enhancing the local EEBs' monitoring and management capacity, with focus on the Liaoning and Hebei provinces,⁴ where many PU foam enterprises are concentrated. This includes training on policy implementation, monitoring and enforcement, use of the MEE's management and information system, and support for the integration of the Montreal Protocol implementation work in the scope of day-to-day EEB work to ensure the sustainability of both HCFC and CFC phase-out.

64. Table 3 presents the budget for activities included in the implementation plan of the sixth tranche.

financial audit reports and, once all the remaining balances under the projects included in the financial audit had been disbursed and those projects had been completed, to continue such reporting under the annual progress reports of stage II of the PU foam sector plan of the HPMP.

⁴ Other provinces that have already received similar assistance over the course of the HPMP are Shandong, Zhejiang, Jiangsu, Jiangxi, Fujian, Inner Mongolia, Guangdong, Anhui, Sichuan, Henan, Chongqing, and Shanghai.

Table 3. Budget for the sixth tranche of stage II of the PU foam sector plan in China (World Bank)

Activity	Cost (US \$)
Completion of the conversion of eight PU foam enterprises to water-based, HFO, and HC technology, and conversion of 190 SMEs through 15 participating systems houses	3,570,000
Technical assistance including enterprise performance verification, research on alternatives in specific applications, technical support and training for SMEs, capacity building for EEBs with focus on Liaoning and Hebei provinces, public awareness and outreach, and formulation and revision of sector standards	1,155,000
Project monitoring, including:	
- Project staff – programme management, support, financial procurement, legal support	108,832
- Domestic travel	9,451
- Domestic meetings	7,297
- Consulting services	8,077
- Operating costs – daily operating expenses, support staff, office facilities and equipment	141,343
Subtotal for project monitoring	275,000
Total	5,000,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Report on HCFC consumption

65. The consumption of HCFC-141b in the PU foam manufacturing sector in 2024 amounted to 1,042.7 ODP tonnes, remaining below the 1,078.4 ODP tonnes of allowable consumption set out in the Agreement between the Government of China and the Executive Committee, as shown in table 4.

Table 4. HCFC-141b consumption and phase-out targets for the PU foam sector in 2020-2024

PU foam sector		2020	2021	2022	2023	2024
Consumption*	mt	26,176	22,776	25,296	8,673	9,479
	ODP tonnes	2,879.4	2,505.3	2,782.5	954.03	1,042.69
Maximum allowable consumption**	mt	26,961	26,961	26,961	9,804	9,804
	ODP tonnes	2,965.7	2,965.7	2,965.7	1,078.4	1,078.4
Phase-out targets	mt	7,353	n/a	n/a	17,877	n/a
	ODP tonnes	808.8	n/a	n/a	1,887.3	n/a

* As per the country programme implementation report.

** As per the Agreement for stage II (2016-2024) approved at the 86th meeting.

66. Although HCFC-141b consumption in the PU foam sector increased in 2024 compared to 2023, it remained within the maximum allowable limit for the year. Acknowledging that the ban on the use of HCFCs in the PU foam sector—excluding spray foam—has been postponed to 1 January 2026, the World Bank outlined a series of measures being implemented to ensure compliance with the maximum allowable HCFC consumption of 330 ODP tonnes in the PU foam sector for 2025. These measures include strict enforcement of the HCFC-141b production quotas for the two remaining producers and the closure of one in 2024; three enforcement training sessions for provincial and local EEBs on supervision and monitoring practices and the upcoming regulatory changes; expansion of the registration system for ODS and HFC producers and users within MEE's management and information system, ensuring these entities are included in annual monitoring plans; and targeted industry outreach and public awareness campaigns at national, provincial and local levels. Additionally, the completion of conversions at the remaining individual enterprises and systems houses will support the next reduction milestone and contribute to the full phase-out of HCFC-141b by 1 January 2026.

Status of progress

67. The World Bank confirmed that all individual enterprises were expected to complete conversions by the end of 2025, while the delivery of training and raw materials by systems houses to SMEs would continue during 2026. The World Bank explained that the ban on the use of HCFC-141b in the PU foam sector was postponed based on the findings of the study on the ban and consultations with the foam association, which indicated that, while most large manufacturers had made the transition away from HCFCs, some foam manufacturers, particularly SMEs across the remaining subsectors, but particularly in the spray foam application, were not ready for a complete phase-out.

68. In addition, in line with the Government's efforts to streamline the rule promulgation process, the planned bans for the PU foam and solvents sectors would be combined into a single ban on HCFC-141b use starting on 1 January 2026, with the exception of the spray foam subsector, which, up to 30 June 2026, would be allowed to continue using HCFCs that had been stockpiled either in bulk or in the form of pre-blended polyols produced prior to 2026, in line with China's commitment to achieve zero consumption of HCFC-141b in the PU foam sector in 2026.

69. In providing more detail on how the systems houses were aiding the SMEs to convert to low-GWP alternatives in a sustained manner, the World Bank explained that assistance was provided in the form of lower cost pre-blended polyols for trials, as well as testing and technical, hands-on assistance. Upon receipt of the assistance, each downstream SME is to submit a letter of commitment to FECO that they would no longer use HCFC-141b in pre-blended polyols. FECO will monitor and verify phase-out progress at downstream users and gauge the systems houses' performance in delivering the support. Under the sixth tranche, a relevant industry association will provide additional technical assistance to SMEs, including training and on-site support based on SMEs' needs.

70. Regarding the ongoing research on alternatives for the shoe sole application,⁵ the World Bank reported that it was manufactured mostly by SMEs and included high-density soles (e.g., for work boots and beach shoes) using water as a foaming agent, and low-density, wear-resistant soles that relied solely on HCFC-141b. Although cyclopentane is a proven alternative, it is not viable for SMEs due to the cost and capacity limits. HFOs offer good quality but are still expensive for SMEs, even though their prices have slightly decreased; water-blown technology has several drawbacks, including brittleness, poor adhesion, and stiffness; and methylal was found to be flammable, unstable, and poorly insulating. Based on the research results, a cost-effective solution is being developed in the form of water-based foam with additives in the polyol to improve performance and foam characteristics. Expected to be completed by the end of 2025, this solution will facilitate adoption of low-GWP alternatives by SMEs in the affected subsector.

Project implementation and monitoring

71. As the lead implementing agency for the HPMP for China, UNDP provided a cumulative report on the project management unit (PMU) expenditures, in line with decision 81/46(b). The PMU expenditures related to stage II of the PU foam sector are summarized in table 5.

Table 5. PMU cumulative expenditures for stage II of the PU foam sector plan (2017-2024)

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	1,845,548
	Domestic travel	100,623
	International travel	7,205
	Domestic meetings	76,136
	International meetings	0
	Consulting services	63,681
Subtotal for sector-specific costs		2,093,193

⁵ Estimated to use around 220 ODP tonnes of HCFC-141b per year.

Item	Description	Cost (US \$)
Operational costs	Shared costs (support staff, computers, internet, printing, office operation and maintenance)	1,234,214
Total disbursement		*3,327,407

* Including US \$962,658 funded by stage II of the HPMP and US \$2,364,749 co-financed by the Government of China.

Gender policy implementation

72. In line with the Fund's gender mainstreaming policy (decisions 84/92 and 90/48(c)), FECO continued to encourage women's participation in all activities implemented under the plan. Accordingly, women accounted for about 15 per cent of participants in FECO's workshop on HCFC-141b phase-out implementation progress, 18 per cent of the staff at the enterprises and systems houses that started projects under the current tranche, and 40 per cent of consultants working on technical assistance activities. Under the sixth tranche, the gender ratio of training and workshops attendees will continue to be monitored and women will be encouraged to participate in activities organized under the plan.

Sustainability of the HCFC phase-out and assessment of risks

73. The implementation of the upcoming bans on the use of HCFC-141b for all PU foam applications, effective 1 January 2026 for all uses except spray foam, and 1 July 2026 for spray foam, will contribute significantly to the sustained phase-out of HCFC-141b in the sector. To support the long-term adoption of low-GWP technologies, stage II includes a comprehensive package of training sessions, materials, workshops, and stakeholder meetings, with the goal of strengthening enterprise capabilities, enhance the understanding of relevant policies, and promote knowledge-sharing and dissemination of lessons learned.

74. The recent study on the impact of the ban confirmed that enterprises not receiving Multilateral Fund assistance were primarily adopting HCs and water-based technologies. For example, around 200 solar water heater and 200 panel manufacturers adopted HCs; 300 refrigeration manufacturers adopted water with HCs or HFOs; 250 pipe manufacturers adopted HC or water-based technology; the largest electric water heater manufacturers converted to HCs; a few enterprises focused on flame-retardant applications adopted HFCs; nearly 3,000 shoe-sole manufacturers and 80 integral skin foam manufacturers adopted water-based technology; and around 180 spray foam enterprises adopted water-based and HFC alternatives.

Conclusion

75. The Government of China remains in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the PU foam sector plan. Out of the 46 beneficiaries (31 individual enterprises and 15 systems houses) having signed contracts with FECO, 23 individual enterprises completed conversions, eight enterprises are scheduled to complete conversions by the end of 2025, and 15 systems houses, along with the estimated 190 SMEs they supply, are set to complete their conversions in 2026. Technical assistance activities implemented to support conversions to low-GWP alternatives included completion of the study on the impact of issuing the ban on the use of HCFCs in the PU foam sector, research on alternatives for the shoe sole application, and assistance to enhance the EEBs' monitoring and enforcement capacity. The planned ban on HCFC-141b use in the PU foam sector was postponed to 1 January 2026, with spray foam application to follow by 30 June 2026. The level of disbursement of funds approved under the fifth tranche is 24 per cent, and 82 per cent for all funds approved under the stage. Funding for the sixth tranche is required to complete the conversion to low-GWP alternatives of the remaining individual enterprises, systems houses and SMEs supplied by them, and to comply with the next HCFC reduction targets for the sector.

RECOMMENDATION

76. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the fifth tranche of the polyurethane (PU) foam sector plan of stage II of the HCFC phase-out management plan (HPMP) for China; and
- (b) Approving the sixth tranche of the PU foam sector plan of stage II of the HPMP for China, and the corresponding 2026 tranche implementation plan, in the amount of US \$5,000,000, plus agency support costs of US \$350,000, for the World Bank.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) ICR sector	UNDP	Approved: 77 th Revised: 86 th	67.5% phase-out by 2026

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2024	7,487.16 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2024
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		605.00	2,695.00	2,767.10		6,067.10
HCFC-123			7.02	1.56		8.57
HCFC-124				-0.07		-0.07
HCFC-141b		1,042.69			121.00	1,163.69
HCFC-142b		97.50	3.58	129.71		230.79

(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		2025	2026	2027	Total
UNDP	ODS phase-out (ODP tonnes)	153.23	164.89	0.00	318.12
	Funding (US \$)	8,088,626	8,703,643	0	16,792,269

(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)			2,162.5	2,162.5	2,042.4	1,609.9	1,609.9	1,609.9	1,369.6	1,369.6	780.9	780.9	n/a
Agreed funding (US \$)*	UNDP	Project costs	13,368,756	20,000,000	0	2,095,775	9,000,000	0	8,000,000	0	7,559,464	8,134,246	68,158,241
		Support costs	935,813	1,400,000	0	146,704	630,000	0	560,000	0	529,162	569,397	4,771,076
Funds approved by ExCom (US \$)		Project costs	13,368,756	20,000,000	0	2,095,775	9,000,000	0	8,000,000	0	0	0	52,464,531
		Support costs	935,813	1,400,000	0	146,704	630,000	0	560,000	0	0	0	3,672,517
Total funds requested for approval at this meeting (US \$)		Project costs									7,559,464		7,559,464
		Support costs									529,162		529,162

* The total adjusted value of stage II of the HPMP for the ICR 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
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PROJECT DESCRIPTION

77. On behalf of the Government of China, UNDP as the designated implementing agency has submitted a request for funding for the sixth tranche of the industrial and commercial refrigeration and air-conditioning (ICR) sector plan of stage II of the HCFC phase-out management plan (HPMP), in the amount of US \$7,559,464, plus agency support costs of US \$529,162.¹ The submission includes the progress report on the implementation of the fifth tranche, the tranche implementation plan for 2026 to 2027, and verification reports in line with subparagraph 5(c) of the Agreement between the Government of China and the Executive Committee.

78. This submission is based on the revised extended plan of action for the ICR sector for the 2021-2026 period, at a total amount of US \$32,693,710, plus agency support costs, approved by the Executive Committee at its 86th meeting. The adjusted total funding approved in principle for the entire stage II of the ICR sector plan is US \$68,158,241, plus agency support costs (decisions 86/34 and 86/35).

79. The stage II extension (2020–2026) will reduce 15,225.28 metric tonnes (mt) (828.99 ODP tonnes) of HCFC consumption in order to achieve a 67.5 per cent reduction of the ICR sector baseline by 2025. Of the 15,225.28 mt, 1,980.00 mt will be phased out through the conversion of manufacturing lines to technologies with low global-warming potential (GWP), and 13,245.28 mt will be phased out through the conversion of compressors, policy and regulatory measures, technical assistance activities, and a reduction in foreign-owned enterprises.

Progress report on the implementation of the fifth tranche of stage II of the industrial and commercial refrigeration and air-conditioning sector plan

Enterprise-level activities

80. As of 31 July 2025, contracts were signed with 19 enterprises for the conversion of 29 manufacturing lines to phase out 3,584.13 mt of HCFC-22 after verification of the baseline consumption and capacity of these lines. The implementation of the conversion of the manufacturing lines is progressing and is being closely monitored according to the defined milestones.² For the conversion projects that have contracts signed under the first five tranches, 18 lines have completed national acceptance and phased out 2,558.73 mt of HCFC-22, four lines have completed the design and procurement contracts, and seven lines with signed contracts started to carry out project design and procurement. After the approval of the fifth tranche at the 93rd meeting in 2023, the conversion of one line was completed, conversions of two lines have passed the national acceptance, four lines have completed the design and started the procurement of equipment, and seven contracts have been signed to convert seven manufacturing lines; these enterprises have started to carry out project design. Table 1 shows the progress in the conversion of manufacturing lines achieved to date.

Table 1. Progress in the conversions of manufacturing lines under the first five tranches of stage II

#	Enterprise	Phase-out (mt)	# of lines	Product type	Alternative technology	Funding (US \$)	Milestones achieved
First tranche							
1-1	Yantai Moon	590.23	1	Water chiller (heat pump)	R-290	9,319,613	Operationally and financially complete

¹ As per the letter of 12 September 2025 from the Ministry of Ecology and the Environment of China to UNDP.

² The milestones 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).

#	Enterprise	Phase-out (mt)	# of lines	Product type	Alternative technology	Funding (US \$)	Milestones achieved
1-2	Dunham-Bush	20.42	1	Heat pump water heater	HFC-32	282,762	Operationally and financially complete
1-3	Nanjing TICA	91.58	1	Freezers, refrigeration and condensing units	NH ₃ /CO ₂	968,400	Operationally and financially complete
1-4	Nanjing TICA	32.52	1	Heat pump water heater	CO ₂	547,038	Operationally and financially complete
1-5	TCL Zhong Shan	115.31	1	Unitary air conditioners	HFC-32	1,020,456	Operationally and financially complete
1-6	Guangdong Jirong	21.13	1		HFC-32	292,769	Operationally complete, some financials remain
Subtotal 1st tranche		871.19	6			12,431,038	
Second tranche							
2-1,2	Yantai Aowei	183.35	2	Freezers, refrigeration and condensing units	NH ₃ /CO ₂	2,730,088	Operationally and financially complete
2-3	Zhejiang Guoxiang	42.18	1	Unitary air conditioners	HFC-32	504,288	Operationally and financially complete
2-4,5	Haixin Shandong	190.57	2		HFC-32	1,772,583	Operationally and financially complete
2-6	Qingdao Haier	*493.31	1		HFC-32	3,265,986	Operationally and financially complete
2-7	Dunham-Bush	112.20	1	Water chiller (heat pump)	R-513A	1,610,512	Operationally and financially complete
2-8	Dunan Environment	147.34	1		R-513A	2,030,774	Operationally and financially complete
2-9	Zhejiang Guoxiang	95.22	1		R-513A	1,407,457	Operationally complete, some financials remain
2-10	Bingshan Refrigeration & Heat Transfer Technologies**	237.04	1		R-290	3,373,561	Operationally and financially complete
2-11	Shandong Shenzhou	114.09	1	Freezers, refrigeration and condensing units	NH ₃ /CO ₂	1,633,116	Operationally and financially complete
Subtotal 2nd tranche		*1,615.30	11			18,328,365	
Third tranche							
3-1	Bingshan Refrigeration & Heat Transfer Technologies**	72.24	1	Water chiller (heat pump)	R-290	1,231,414	Operationally and financially complete
Subtotal 3rd tranche		72.24	1			1,231,414	
Fourth tranche							
4-1,2	Jinan Oufeite	334.89	2	Freezers and refrigeration and condensing units	NH ₃ /CO ₂	3,858,356	Project designs and procurement contracts completed
4-3,4	Jinan Dasen	213.67	2		NH ₃ /CO ₂	2,667,108	
4-5	Dunham *** Bush/Hartford	0	1	Screw compressor	R-513A	1,200,000	Contract signed and project design started
Subtotal 4th tranche		548.56	5			7,725,464	

#	Enterprise	Phase-out (mt)	# of lines	Product type	Alternative technology	Funding (US \$)	Milestones achieved
Fifth tranche							
5-1	Qingdao Haier	140.27	1	Unitary air conditioners	HFC-32	1,121,697	Contract signed and project design started
5-2	Nanjing TICA	62.36	1	Water chiller (heat pump)	R-513A	941,356	Contract signed and project design started
5-3	Zhejiang Zhongguang	55.03	1	Heat pump water heater	HFC-32	584,695	Contract signed and project design started
5-4	Nanjing Jiuding	54.90	1	Water chiller (heat pump)	R-513A	871,232	Contract signed and project design started
5-5	Guangdong Ruixing	42.84	1	Heat pump water heater	HFC-32	487,878	Contract signed and project design started
5-6	Zhejiang Kaidi	121.44	1	Freezers and refrigeration and condensing units	NH ₃ /CO ₂	1,496,755	Contract signed and project design started
Subtotal 5th tranche		476.84	6			5,503,612	
Total		3,584.13	29			45,219,893	

* The consumption of line 2-6 at Qingdao Haier was erroneously reported to the 93rd meeting as 492.00 mt.

** Dalian Refrigeration was renamed to Bingshan Refrigeration & Heat Transfer Technologies Corp. Ltd. in 2020.

*** Dunham Bush was renamed to Hartford in 2022.

Verification of the converted lines

81. The completion of conversions of four manufacturing lines³ in 2023 has resulted in the phase-out of 548.20 mt of HCFC consumption. In accordance with subparagraph 5(c) of the Agreement,⁴ the verification of converted lines was conducted at Bingshan Refrigeration & Heat Transfer Technologies Corp. Ltd. (previously named Dalian Refrigeration), covering one manufacturing line and 237.04 mt of HCFC-22 consumption. The verification covers 43 per cent of the total phase-out and 25 per cent of the total number of lines converted in 2023. The verification confirmed that the production line using HCFC-22 had been converted to the use of R-290; that the old equipment had been destroyed; and that the enterprises were committed to not using HCFC-22 in the converted line. The enterprise started producing units with the designed alternatives and has produced 43 units of equipment with capacity up to 20 kW.

Technical assistance activities

82. Several technical assistance activities have been undertaken to enable the smooth conversion of manufacturing lines at the enterprises. The progress is summarized as follows:

- (a) The feasibility study and impact assessment on banning the use of HCFCs as refrigerants in the multi-link air-conditioning (heat pump) subsector was planned in the fourth tranche. The objective of the ban is to create market conditions for adopting low-GWP technologies to support the sustainability of the phase-out. The technical assistance includes plans to solicit views from industry stakeholders (enterprises, industry associations and other relevant parties) and conduct an assessment on the social economic and environmental impact of the ban, and proposes technical and policy recommendations. The technical assistance was completed in March 2025. Based on the technical and policy recommendations proposed, a ban will be implemented starting from 31 December 2026;

³ Nanjing TICA (line no. 1-3), Dunan Environment (line no. 2-8), and Bingshan Refrigeration (line no. 2-10 and 3-1).

⁴ 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.

- (b) Development of a technical guide for adoption of alternative technologies to HCFCs in small- and medium-sized enterprises (SMEs) was planned to support the HCFC phase-out at SMEs in the ICR sector. An expert will be employed to prepare a guide for selecting and adopting alternative technologies suitable for SMEs. The expert will provide support to SMEs during project publicity, mobilization and implementation to guide them in understanding the national phase-out policy and mobilize their participation in HPMP implementation. The expert will also provide targeted technical assistance to SMEs during the adoption of alternatives in stage II. A contract was signed with Tianjin University in May 2023. As of July 2025, the contractor has drafted the alternative technology guidelines for SMEs, provided targeted technical guidance to 40 individual SMEs in their alternative technology transformation, and provided technical support to the implementation of the ICR sector plan, with a total 120 enterprises having benefited from the technical assistance. The technical assistance will be completed by the end of 2025;
- (c) The assessment of environmental benefits of low-GWP alternative refrigeration technologies in the ICR sector was planned under the fourth tranche. The technical assistance aims to assess the costs, performance and energy efficiency of the alternative technologies adopted in the ICR sector from 2010 to 2020 to further promote these technologies. The contract was signed with Hefei General Machinery Research Institute Co. Ltd. in May 2023. The contractor has developed a methodology for the assessment of environmental benefits and costs of major alternative refrigerants of different applications in the ICR sector. Currently, the contractor is analyzing data and carrying out case studies on low-GWP alternatives so far adopted in the ICR sector to further promote them. The project is expected to be completed by the end of 2025;
- (d) Revision of technical standards for refrigeration equipment (ice-making units for direct cooling ice rinks) and screw refrigerant compressors (GB/T 19410-2008) for the use of zero-ODP low-GWP alternatives in the ICR sector has been cancelled and instead a revision of the standard on the safety and environmental requirements of refrigeration systems and heat pumps (GB/T 9237) has been drafted. This is to prioritize the update of standard GB/T 9237 which is a fundamental safety standard for the application of alternative refrigerants, specifying the usage thresholds for flammable refrigerants. The standard revision is essential for enabling the commercialization and wider deployment of alternative refrigerants and will play a crucial role in promoting their market adoption;
- (e) An action plan for the research on the improvement of product quality and efficiency of transcritical carbon dioxide (CO₂) technology is under consultation with stakeholders;
- (f) The terms of reference have been drafted for the research on the revision of the building and fire suppression standard to address the barriers to using flammable refrigerants (HFC-32) in building ventilation systems, and the bidding process is ongoing;
- (g) The study on technical and safety requirements for products and components in the ICR sector aims to address the technical needs of alternative technologies to HCFCs while ensuring compliance with safety standards. The technical assistance will review existing safety requirements and assessment methods for ICR equipment in various standards and make recommendations to support the development of a new mandatory national standard. A contract was signed with Hefei General Machinery Research Institute Co., Ltd in December 2023. The contractor has reviewed relevant literatures and domestic and international standards, conducted site visits to equipment manufacturers, and conducted research on the performance indicators, parameters and methods through testing and analytical experiments. Based on the research, the contractor developed a draft standard

for public consultation and for submission. The project was officially completed, and a national standard is in the stage of review and approval;

- (h) Regulations and standards impose refrigerant charge limits on HFC-32-based equipment due to its flammability. A study aimed at reducing the HFC-32 charge limit is planned to lower costs while ensuring safety, thereby supporting the market adoption of HFC-32-based units. The technical assistance will focus on methods to minimize the flammable refrigerant charge in the cooling circuit, as well as on safety measures and best practices. A contract was signed with the University of Shanghai for Science and Technology and Zhuhai Gree Electric Appliances Co., Ltd. in December 2024, and the project is currently in progress; and
- (i) The refrigeration subsector mainly consists of SMEs producing small- and medium-sized compression condensing units, which are mostly non-standard and customized products. These SMEs often have limited technical capacity and experience and are facing significant challenges in adopting NH₃ or CO₂ technologies. Technical assistance is planned to conduct research on the use of HFC/HFO refrigerants with CO₂, applied either as a cascade system or as a secondary refrigerant system, as alternatives to HCFCs in small- and medium-sized refrigeration equipment. It will also assess the applicability of these technologies for wider use in the ICR sector. A contract was signed with a group of contractors (Xi'an Jiaotong University, Hefei General Machinery Research Institute Co. Ltd, Technical Institute of Physics and Chemistry CAS and Zhengzhou Kaixue Cold-chain Co. Ltd) in April 2025, and the project is currently in progress.

83. Other technical assistance activities include verification of manufacturing lines conversion (baseline, milestones and completion) by an accounting firm and coordination and support from the China Refrigeration and Air-Conditioning Industry Association (CRAA) in implementation.

84. Meetings, conference, seminars, exhibitions and workshops were held to raise public awareness on the HCFC phase-out, low-GWP alternatives, and energy conservation and provide training on project implementation, as summarized below:

- (a) Two Ozone2Climate Technology Road Shows and Industry Roundtable Series activities were organized to raise awareness and promote low-GWP technologies. The road shows provide a platform for all stakeholders to demonstrate new technologies and products; exchange information on the technology development trends in the ICR industry; discuss policy and technological issues; and raise awareness on HCFC phase-out achievements and targets and the introduction of low-GWP technologies. Over 40 manufacturers exhibited their products, including low-GWP technologies based on CO₂, ammonia (NH₃), hydrocarbons, HFC-32, HFO and other zero-ODP, lower-GWP, energy-efficient alternatives and solutions. Representatives and experts, including international institutions, enterprises, and universities, shared the latest implementation policies, technology developments and practical experience abroad and in China. Over 5,000 people attended the two exhibitions in-person and online, including a delegation from Bangladesh;
- (b) An international forum on the sustainable development of the refrigeration and air-conditioning industry was held in Hefei Province, where close to 400 people attended (including 120 women), with the theme of working together to promote energy transformation. The conference focused on the current domestic and international situation of the industry, analyzed international policies on market access and regulatory mechanisms, shared the latest global trends in sustainable development, discussed green

and low-carbon innovation initiatives and application scenarios across product life cycle, and explored green growth paths for the industry;

- (c) The 12th China Automotive Thermal Management Technology Annual Conference was held in Shanghai. The conference focused on key technical challenges and solutions, including refrigerant replacement for heat pump air conditioners and integration of vehicle thermal management and battery thermal management. Close to 300 representatives (including 100 women) from automotive original equipment manufacturers, thermal management system and component suppliers, technology companies, universities, and investment institutions participated in the conference; and
- (d) Other meetings were held, covering carbon emission reductions in data centres, industry transformation, green refrigeration and air-conditioning industry and the dissemination of key policies and standards, and applications of artificial intelligence technologies in the refrigeration and air-conditioning industry, as well as the CRAA annual meeting to inform the progress in fulfilling the obligation under the Montreal Protocol and policy requirements. These meetings support technological innovation and transition towards energy-efficient, low-GWP replacement technologies.

Project implementation and monitoring unit

85. The project management unit (PMU) continues to monitor progress, coordinate implementation, and prepare relevant progress reports under the assistance of UNDP. Of the total budget of US \$421,600 allocated to the PMU under the fifth tranche of the ICR sector plan, US \$257,290 has been disbursed for project staff (US \$142,281), domestic travel (US \$11,320), international travel (US \$1,029), meetings (US \$8,233), consultancy (US \$6,947), and office expenses (US \$87,480). The cumulative disbursement of the PMU in the ICR sector is presented in table 4 below.

Level of fund disbursement

86. As of October 2025, of the US \$52,464,531 approved so far, US \$46,128,988 (88 per cent) had been transferred from UNDP to the Foreign Environmental Cooperation Centre (FECO), and US \$43,180,732 had been disbursed to final beneficiaries (enterprises and contractors for technical assistance activities) by FECO and directly by UNDP, accounting for 82 per cent of the total funding approved, as shown in table 2.

Table 2. Status of disbursement of stage II of the ICR sector plan as of September 2025

Funding tranche	Funds approved	Disbursement from UNDP to FECO*		Disbursement to final beneficiaries**		Fund balance
	Amount (US \$)	Amount (US \$)	Rate (%)	Amount (US \$)	Rate (%)	Amount (US \$)
First	13,368,756	13,298,756	99	13,368,756	100	0
Second	20,000,000	19,775,000	99	20,000,000	100	0
Third	2,095,775	2,095,775	100	2,095,775	100	0
Fourth	9,000,000	8,954,000	99	6,045,496	67	2,954,504
Fifth	8,000,000	2,005,457	25	1,670,705	21	6,329,295
Total	52,464,531	46,128,988	88	43,180,732	82	9,283,799

* The interest accrued from the funds held by FECO of US \$103,708, US \$97,468, US \$99,480, US \$159,433, and US \$22,240 for the period of 2015 to 2025 was deducted from the approved funds before transfer. Therefore, the actual amount transferred equals the disbursement from UNDP to FECO, net of the interests accrued.

** Includes disbursements directly from UNDP to final beneficiaries of US \$359,875 under the first (US \$70,000), second (US \$225,000), fourth (US \$46,000), and fifth (US \$18,875) tranches.

87. In line with decision 95/43(b), UNDP confirmed that it applied the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the ICR sector plan. UNDP has closely monitored the level of funds disbursed to FECO and from FECO to beneficiaries. The balance of funds held by FECO, as of October 2025, would be US \$2,954,504 against the fourth tranche, approved at the 88th meeting in November 2021 and US \$353,627 against the fifth tranche, approved at the 93rd meeting in December 2023. These represent 33 per cent of the total funding approved for the fourth tranche that were disbursed by UNDP to FECO through the years 2022 to 2025, and 4 per cent of the total funding approved under the fifth tranche, disbursed by UNDP to FECO through the years 2024 to 2025. UNDP will continue monitoring closely the disbursements by FECO to beneficiary enterprises before releasing additional funds.

Implementation plan for the sixth tranche of stage II of the industrial and commercial refrigeration and air-conditioning sector plan

88. The sixth tranche of the ICR sector plan in China, with a total budget of US \$7,559,464, will be implemented from 2026 to 2027 and include the following activities:

- (a) SMEs constitute a large proportion of the ICR sector. The phase-out of HCFCs in SMEs is crucial for China to meet its compliance targets. The sixth tranche includes the conversion of five manufacturing lines, prioritizing support to SMEs and the transition to low-GWP technologies, as well as the establishment of regional technical support centres in key provinces and cities to provide technical assistance to SMEs (US \$4,843,694);
- (b) Seven demonstration projects are planned to showcase the use of low-GWP alternative technologies⁵ in each stage of the cold chain⁶ to support the HCFC phase-out and promote a sustainable, energy-efficient cold chain in the ICR sector (US \$1,500,000):
 - (i) *Food cold processing and frozen storage in the industrial sector*: Three projects to demonstrate alternative technologies for end users in food cold processing and frozen storage stages. The demonstration will include the use of various refrigeration equipment such as chilling of livestock and poultry meat with cold air chilling and water cooling, achieving quick-freezing through blast freezing, indirect contact freezing; and direct contact freezing; and cold storage facilities (US \$750,000);
 - (ii) *Commercial logistics platforms and urban fresh food distribution centres*: Three projects to demonstrate alternative technologies in small- to medium-sized cold storage facilities at logistics platforms and fresh food distribution centres, supermarkets. This will include the demonstration of key equipment such as commercial refrigerators, commercial ice makers and cold storage refrigeration equipment (US \$600,000);
 - (iii) *Small- to medium-sized cold processing and plant terminal users at production sites*: One project to demonstrate alternative technology in cold processing, controlled atmosphere cold storage, and cooling equipment for vegetable cultivation at production sites. This will include key equipment applications such as pre-cooling of fruits and vegetables, quick-freezing of foods, and controlled atmosphere cold storage (US \$150,000);

⁵ Technologies under consideration include CO₂, NH₃, CO₂ cascade technology, and HFC-32.

⁶ The cold chain logistics consist of several key stages that ensure temperature-sensitive products (fresh food, frozen goods, pharmaceuticals, etc.) maintain their quality and safety until use. The key stages include pre-cooling, cold storage, refrigerated transportation, distribution, and retail display.

- (c) Technical assistance activities (US \$800,000):
- (i) Establishment of a new technical standard on refrigeration units for small- and medium-sized cold storage applications (US \$50,000);
 - (ii) Research and develop a report on technical and policy coordination for relevant authorities in the ICR sector to facilitate the development of supportive policies that promote sustainable compliance (US \$200,000);
 - (iii) Verification of manufacturing line conversion: The accounting firm will assist FECO to do the beneficiary performance verification based on the project implementation (US \$100,000);
 - (iv) A comprehensive assessment of HCFC refrigerant use across the ICR industry, and a feasibility study to evaluate a potential ban on the manufacture and use of HCFC-based ICR equipment, taking into account the new regulations, related policy measures, the progress of HCFC phase-out, and the maturity of alternative technologies (US \$200,000);
 - (v) Consultants to provide technical advice and serve as independent peer reviewers of the research studies; provide independent third-party advice on technical assessments and strategies and support informed decision-making; and conduct a gender assessment in line with decision 92/40 (US \$50,000);
 - (vi) Implementation support agency to assist FECO in supporting the enterprises to achieve their milestones (US \$200,000): Includes technical staff (US \$135,000), travel and accommodation (US \$34,800), office operations (US \$19,000), and conferences (US \$11,200); and
- (d) PMU (US \$415,770): Monitoring and management of project activities in the ICR sector, including staff (US \$259,800), consultants (US \$14,470), domestic travel (US \$19,200), meetings (US \$15,000), and office expenses (US \$107,300).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Report on HCFC consumption

89. The consumption of HCFCs in the ICR sector in 2024 was 24,406 mt (1,330.59 ODP tonnes), which is below the allowable level of consumption in the Agreement between the Government of China and the Executive Committee, as shown in table 3.

Table 3. Reduction in HCFC consumption in the ICR sector

	2020	2021	2022	2023	2024
mt					
Maximum allowable consumption	29,603	29,603	29,603	25,191	25,191
Actual consumption in the ICR sector*	28,575	27,605	29,105	24,535	24,406
Reduction targets set in the HPMP	7,872	0	0	4,411	0
ODP tonnes					
Maximum allowable consumption	1,609.90	1,609.90	1,609.90	1,369.62	1,369.62
Actual consumption in the ICR sector*	1,554.43	1,500.03	1,582.53	1,333.63	1,330.59
Reduction targets set in the HPMP	432.50	0.00	0.00	240.28	0.00

* Based on estimated amounts, as actual amounts cannot be accurately verified.

90. HCFC consumption in the ICR sector in 2023 and 2024 has significantly decreased compared to the increasing trend observed in 2022. This reduction is primarily attributed to the targeted phase-out of 4,411 mt (240.28 ODP tonnes) of HCFCs through the conversion of manufacturing lines and the enforcement of the quota system implemented under the ICR sector plan of stage II of the HPMP. The consumption level in 2024 has remained similar to that in 2023, indicating that the reduction achieved in 2023 has been effectively sustained. It is expected that HCFC consumption will continue to decline with the ongoing implementation of the ICR sector plan and the introduction of alternatives to HCFCs.

Technical issues

91. The implementation of the ICR sector plan is progressing, and the 18 manufacturing lines converted to alternative technologies (R-290, NH₃, CO₂, R-513A, HFC-32) have manufactured and sold 715,196 units of ICR equipment to the market. As a result of the implementation of the ICR sector plan, alternative technologies are gradually gaining market penetration. However, UNDP also reported that low-GWP alternative technologies have not yet achieved widespread adoption and still require further promotion and support. The high cost of refrigerants, along with increased expenses in equipment manufacturing and servicing, remain barriers to their broader adoption. The component supply chain for some technologies has made progress but compared to the supply chain for the refrigerants being replaced, the supply chain for components is not yet fully developed, and short-term manufacturing costs have risen more than expected.

92. To address these challenges, some manufacturing enterprises are striving to improve product safety, operational stability, and energy efficiency through research and development in order to enhance market competitiveness and meet customer demands. Yet only limited enterprises have inherent research and development capacity. SMEs face greater difficulties in adopting low-GWP alternatives due to limited technical and financial capacity, compounded by increased costs, economic contraction, and a highly competitive market with narrow profit margins, all of which challenge business continuity.

93. The sixth tranche includes seven demonstration projects at end-user sites to address challenges in the market adoption of alternative technologies in the cold chain industry. These demonstrations will showcase low-GWP technologies produced by the converted lines, raise awareness and visibility of these technologies, and support their adoption in the cold chain sector. UNDP has confirmed that various awareness-raising activities will be conducted to disseminate information on these demonstrations, and that detailed reports on their results will be submitted upon completion, enabling the Secretariat to develop fact sheets to inform future projects.

Project implementation and monitoring unit

94. UNDP, as the lead agency for stage II of the HPMP, provided a cumulative report on PMU expenditures in line with decision 81/46(b). Based on that report, the expenditures related to the PMU for stage II of the ICR sector plan implemented by UNDP are summarized in table 4.

Table 4. PMU cumulative expenditures for stage II of the ICR sector plan from 2017 to 2024

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	2,298,496
	Domestic travel	181,119
	International travel	17,723
	Domestic meetings	134,785
	International meetings	0
	Consulting service	110,815
Subtotal for sector-specific costs		2,742,938
Operational costs		2,120,923
Total disbursement*		4,863,861

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

Gender policy implementation

95. The implementation of stage II of the HPMP has been taking into account the gender mainstreaming policies of the Multilateral Fund, UNDP, and the related guidance from the Ministry of Ecology and Environment to the extent possible to encourage the full engagement of women in various steps such as planning, policy and decision-making, brainstorming and advisory, and monitoring and evaluation. In the sixth tranche, the mandatory requirements and performance indicators under decision 92/40 will also be incorporated, and a gender assessment will be carried out. Women will continue to be encouraged to participate in all events and activities organized under stage II of the ICR sector plan, including meetings, trainings, workshops, capacity-building activities and outreach activities. All training centres will be further guided and advised to encourage female instructors/trainers to deliver trainings and encourage female technicians and students to join the training workshops. Outreach and training materials will also be developed to highlight and promote the participation of women when applicable.

Conclusion

96. The Secretariat notes that the implementation of the fifth tranche of the ICR sector plan has been progressing well. Conversions of 18 manufacturing lines have been completed, resulting in the elimination of 2,558.73 mt of HCFC-22, replaced with low/zero-GWP (1,321 mt, 52 per cent), HFC-32 (882.93 mt, 35 per cent), and R-513A (354.76 mt, 14 per cent) technologies. The conversion of the remaining manufacturing lines is ongoing. Several technical assistance activities have been implemented to support the manufacturing conversions, including research and technology studies to promote market adoption of alternatives; the development and updating of technical guidelines and standards to ensure compliance with safety regulations and facilitate manufacturing conversions; and training and awareness-raising activities to promote alternative technologies. SMEs are facing challenges in adopting low-GWP technologies in an increasingly competitive market due to limited technical and financial capacity. The sixth tranche will therefore prioritize support for the transition of SMEs. The implementation plan for the sixth tranche includes demonstration projects to further promote the market adoption of low-GWP technologies. In view of the progress made and the overall funding disbursement of 82 per cent, the Secretariat recommends approval of the sixth tranche.

RECOMMENDATION

97. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the fifth tranche of the industrial and commercial refrigeration and air-conditioning (ICR) sector plan of stage II of the HCFC phase-out management plan (HPMP) for China;
- (b) Approving the sixth tranche of the ICR sector plan of stage II of the HPMP for China, and the corresponding 2026–2027 tranche implementation plan, in the amount of US \$7,559,464, plus agency support costs of US \$529,162 for UNDP; and
- (c) Requesting UNDP to submit detailed reports on the results of the demonstration projects on technologies with low global-warming potential in the cold chain industry, once they are completed, to enable the Secretariat to develop fact sheets that will inform future projects.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

CHINA

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) RAC sector	UNIDO (lead), Italy, Austria	77th	37.6% phase-out by 2020

(II) LATEST ARTICLE 7 DATA (Annex C, Group I)	Year: 2024	7,487.16 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2024
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		605.00	2,695.00	2,767.10		6,067.10
HCFC-123			7.02	1.56		8.57
HCFC-124				-0.07		-0.07
HCFC-141b		1,042.69			121.00	1,163.69
HCFC-142b		97.50	3.58	129.71		230.79

(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		2025	2026	2027	Total
UNIDO	ODS phase-out (ODP tonnes)	355.81	351.60	0.00	707.41
	Funding (US \$)	9,327,302	9,216,975	0	18,544,277
Austria	ODS phase-out (ODP tonnes)	0.00	0.00	0.00	0.0
	Funding (US \$)	0	0	0	0
Italy	ODS phase-out (ODP tonnes)	0.00	0.00	0.00	0.00
	Funding (US \$)	0	0	0	0

(VI) PROJECT DATA			2016	2017	2018	2019	2020	2021	2022	2023	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)			3,697.7	3,697.7	2,876.0	2,876.0	2,259.7	2,259.7	2,259.7	1,614.1	1,614.1	1,232.6	1,232.6	n/a
Funding agreed in principle (US \$)*	UNIDO	Project costs	14,671,089	16,000,000	0	0	0	4,150,000	0	6,300,000	0	8,717,105	8,613,995	58,452,189
		Support costs	1,026,976	1,120,000	0	0	0	290,500	0	441,000	0	610,197	602,980	4,091,653
	Italy	Project costs	891,892	0	0	0	0	0	0	0	0	0	0	891,892
		Support costs	108,108	0	0	0	0	0	0	0	0	0	0	108,108
	Austria	Project costs	0	0	0	0	0	350,000	0	700,000	0	0	0	1,050,000
		Support costs	0	0	0	0	0	41,833	0	83,667	0	0	0	125,500
Funds approved by ExCom (US \$)		Project costs	15,562,981		16,000,000			4,500,000			7,000,000			43,062,981
		Support costs	1,135,084		1,040,000			332,333			524,667			3,032,084
Total funds recommended for approval at this meeting (US \$)		Project costs										8,717,105		8,717,105
		Support costs										610,197		610,197

* Total adjusted value of stage II of the HPMP for the RAC sector plan and the funding level of tranches between 2018 and 2026 were approved at the 86th meeting (decision 86/34).

Secretariat's recommendation:	Individual consideration
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PROJECT DESCRIPTION

98. On behalf of the Government of China, UNIDO as the lead implementing agency has submitted a request for funding for the fifth tranche of stage II of the room air-conditioning (RAC) manufacturing and heat pump water heaters (HPWHs) sector plan (RAC sector plan) of the HCFC phase-out management plan (HPMP) for China, in the amount of US \$8,717,105, plus agency support costs of US \$610,197, for UNIDO only.¹ The submission includes a progress report on the implementation of the fourth tranche of the RAC sector plan, the tranche implementation plan for 2025 to 2026, and a verification report in line with subparagraph 5(c) of the Agreement between the Government of China and the Executive Committee.

99. The present document also describes an approach developed by the Secretariat, in consultation with UNIDO, to estimate the tonnage of possible HFCs phased in by Multilateral Fund-assisted enterprises to meet the demand associated with the HCFC-based manufacturing capacity converted to R-290 under the RAC sector plan, in line with decision 94/34(c).

Overview of stage II of the room air-conditioning manufacturing and heat pump water heaters sector plan

100. Stage II of the RAC sector plan comprises an investment component to convert at least 12 RAC manufacturing lines, four compressor manufacturing lines, and three HPWH manufacturing lines to R-290, regulatory actions and technical assistance to facilitate the market uptake of R-290 RAC technology, and project management. The conversion of the manufacturing lines will result in the phase out of 237 ODP tonnes of HCFC-22; an additional 2,228 ODP tonnes of HCFC-22 would be phased out by non-assisted enterprises.

Progress report on the implementation of the fourth tranche of stage II of the room air-conditioning manufacturing and heat pump water heaters sector plan

Legal framework

101. China's import and export licensing system was updated to include HFCs following the ratification of the Kigali Amendment in 2021. The revised regulation on ODS management came into force in March 2025, which added HFCs to the list of controlled substances and included requirements for distributors of controlled substances to register with the ODS management system and to report data; for enterprises to properly dispose of controlled substances; and for large producers and consumers of controlled substances to install monitoring equipment. In April 2025, the State Council approved the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025-2030), which includes specific goals to reduce the consumption and production of substances to meet the complete phase-out of HCFCs by 2030 and the 10 per cent reduction target of the HFC baseline by 2029.

Enterprise-level activities

102. The five RAC manufacturing and four compressor manufacturing enterprises to be converted in the first and second tranches, as well as the three additional RAC enterprises (four lines) added to the third tranche, have completed their conversions, with all incremental capital costs (ICCs) paid, as shown in table 1.

¹ As per the letter of 12 September 2025 from the Ministry of Ecology and Environment of China to UNIDO.

Table 1. RAC and compressor manufacturing enterprises for conversion in the first three tranches

Enterprise name	Manufacturing (units)	Consumption (mt)	ICC (US \$)	Disbursement (US \$)
RAC enterprises				
Changhong Zhongshan	82,536	83.36	1,352,355	1,352,355
Hisense Jiangmen	143,213	110.19	1,147,920	1,147,920
TCL Wuhan	849,042	829.59	1,352,355	1,352,355
TCL Zhongshan	925,867	875.87	1,352,355	1,352,355
Yangzi Chuzhou	294,454	322.11	1,340,805	1,340,805
Guangdong Midea*	153,093	106.63	741,370	741,370
Wuhu Midea – line 1	427,363	951.20	1,015,576	1,015,576
Wuhu Midea – line 2	242,700	781.98	1,015,576	1,015,576
Hefei/Chongqing Haier**	32,792	56.38	1,000,000	1,000,000
Total	3,151,060	4,117.31	10,318,312	10,318,312
Compressor enterprises				
GMCC*	1,384,268	-	861,490	861,490
Shanghai Highly	891,288	-	924,479	924,479
Shenyang Sanyo*	1,465,635	-	969,136	969,136
Xi'an Qing'an	1,682,250	-	1,744,895	1,744,895
Total	5,423,441	-	4,500,000	4,500,000

* Includes non-Article 5 ownership, which is reflected in the ICCs.

** The converted line was relocated to Chongqing Haier.

103. A further three RAC and five HPWH manufacturing lines, with an aggregated consumption of 1,189.13 mt of HCFC-22, had been verified as eligible for participation under the fourth tranche. The conversion of one of the RAC manufacturing lines (AUX (102.15 mt)) to R-290 had been completed using the enterprise's own funding, and two HPWH manufacturing lines (TCL Heating and Ventilation (7.89 mt) and Zhejiang AMA (21.63 mt)) signed agreements and submitted procurement plans, with the equipment delivered and installed. Of the remaining five manufacturing lines to be included under the fourth tranche, the two RAC lines (Guangzhou Hualing (26.57 mt) and Midea Wuhan (935.26 mt)) have signed agreements, submitted procurement plans, and signed equipment contracts; one HPWH manufacturing enterprise (Guangdong Tongyi (85.75 mt)) has signed their agreement and submitted procurement plans; the HPWH line at Zhongshan Amitime (3.28 mt) was shifted to a new enterprise established in 2023 and that line plus an additional six HPWH manufacturing lines were converted to R-290 using the enterprise's own funding; and the final HPWP manufacturer Foshan Kelin (6.60 mt) decided to withdraw from the project due to market and operational reasons. Table 2 summarizes the manufacturing enterprises eligible for conversion.

Table 2. RAC manufacturing enterprises for conversion in the fourth tranche

Enterprise name	Manufacturing (units)	Consumption (mt)	ICC (US \$)	Disbursement (US \$)
RAC enterprises				
Guangzhou Hualing*	45,953	26.57	761,682	685,513
Midea Wuhan*	1,375,523	935.26	741,371	667,233
AUX	53,395	102.15	0	0
Total	1,474,871	1,063.98	1,503,053	1,352,746
HPWH enterprises				
TCL Heating and Ventilation	1,203	7.89	302,000	271,800
Zhejiang AMA	22,005	21.63	302,000	271,800
Guangdong Tongyi	24,474	85.75	302,571	90,771
Zhongshan Amitime	60,000	3.28	0	0
Total	107,682	118.55	906,571	634,371

* Includes non-Article 5 ownership, which is reflected in the ICCs.

104. A total of US \$26,674,200 was allocated to incremental operating costs (IOCs) for RAC under stage II; a total of RMB 64,837,520 (ca. US \$9.1 million) has been disbursed so far.

Sales of R-290 split air-conditioning units

105. As of August 2025, a total of 764,449 R-290 split units had been manufactured and installed; in addition, more than 57,000 R-290 HPWH² and more than 10 million factory-sealed (i.e., dehumidifiers, portable air-conditioning (AC)) R-290 units have been sold.³ In line with decision 84/68(d)(ii), UNIDO provided information on the effect of the incremental IOC incentive scheme on the market uptake of R-290 split AC units: all 764,449 R-290 split units were sold locally; 88 per cent of the sales were for inverter units, and 62 per cent of the sales (including inverter and fixed-speed units) were for the most energy-efficient units, as shown in table 3. Further to this, Midea exported approximately 55,000 split R-290 units with varying energy efficiency levels.

Table 3. Percentage of R-290 RAC split units by energy class sold by August 2025

Split units	Inverter (%)	Fixed-speed (%)
Local sales		
Grade 1 energy efficiency	55	7
Grade 2 energy efficiency	33	5
Grade 3 energy efficiency	0	1

106. In line with decision 94/34(d)(iii), an update on consideration by the Government of China of the suggestions to facilitate the manufacturing of R-290 split AC units described in paragraph 32 of document UNEP/OzL.Pro/ExCom/94/29 can be found in paragraphs 124 to 126 below.

Verification of converted manufacturing lines

107. The verification report confirmed that RAC manufacturing enterprises Chongqing Haier, TCL Wuhan, and Wuhu Midea (lines 1 and 2) completed manufacturing line conversions from HCFC-22 to R-290 technology, and concluded that the new equipment installations and manufacturing processes met the relevant national product and safety standards, that the new lines were capable of running at or above the original manufacturing capacity, and that the baseline equipment was destroyed. Funding allocation for the project was found to be transparent, with funds disbursed cost-effectively and in line with the Foreign Environmental Cooperation Centre's (FECO's) allocation guidelines.

Technical assistance activities

108. Of sixteen research and development projects for the introduction of R-290 technology, with an associated budget of US \$4,265,748, ten have been completed and the remaining six, of which three were launched under the fourth tranche (noise reduction in R-290 AC units and heat pumps, noise reduction in R-290 rotary compressors, and development of test and evaluation systems), continue to progress. Terms of reference for those three projects were prepared, and contractors will be selected through national public bidding. The China Household Electric Appliances Association (CHEAA) and FECO organized a workshop on HFC alternatives where project teams shared results of the completed research and development projects in December 2024.

109. Following the 2022 update to domestic appliance safety standard IEC 60335-2-40, China revised its standard related to safety for household heat pumps, AC units, and dehumidifiers (GB 4706.32) in

² R-290 HPWHs are mostly for export.

³ IOCs will only be provided based on the sale of split R-290 AC units to China and other Article 5 countries. IOCs will not be paid based on sale of factory-sealed units, such as portable AC, window-type AC, and dehumidifiers, which are already established in the marketplace.

July 2024; that revised standard will be implemented on 1 August 2026. The following standards were revised and submitted to the national standardization authority for final confirmation and approval: safety technical specification for manufacturing household and similar use room air conditioners using flammable refrigerants (QB/T 4975-2016); technical requirements for the installation, servicing and transportation of room air conditioners using flammable refrigerants (QB/T 4835-2015), and special requirements for the transportation of room air conditioner products using flammable refrigerants (QB/T 4976-2016).

110. Implementation related to the “Clean Cooling Hub,” in cooperation with the Government of Austria to identify and remove barriers to the global uptake of R-290 in RAC, included preparatory coordination meetings with key stakeholders that resulted in the development of draft terms of reference and an updated implementation proposal, which are currently under internal review.

111. A tentative location has been found for the pilot installation of 10,000 R-290 RAC units; that installation is expected to be undertaken in 2026. Activities to promote the 2017 ecolabel for R-290 RAC units had not yet started.

112. China continued to share lessons learned on R-290 RAC technology with other Article 5 countries, including by organizing: with UNIDO, a side event during the 47th meeting of the Open-ended Working Group in Bangkok; an event on R-290 RAC technology on 21 March 2025 at the Appliance and Electronics World Expo; and a workshop in December 2024; as well as by hosting a delegation led by the Bangladesh Environmental Agency that undertook a study tour to China where they participated in the Ozone2Climate roundtable and roadshow, met with FECO to share progress on their projects, and visited Midea in Wuhu to discuss the R-290 RAC manufacturing line conversions and issues related to safety, market promotion, and energy efficiency of R-290-based AC equipment.

Project implementation and monitoring unit

113. Of the US \$2,277,056 allocated to the project implementation and monitoring unit (PMU) under the first four tranches, US \$3,801,181 was disbursed for staff (US \$2,186,803), domestic travel (US \$104,619), international travel (US \$12,454), domestic meetings (US \$86,467), consulting services (US \$61,741), and shared costs (US \$1,349,097) across the six other sectors in the HPMP and the production sector, as reported to the present meeting.⁴ The cumulative disbursement is higher than the funding allocated under the project; this difference was covered by FECO’s own budget and may be partially reimbursed from PMU of future tranches.

Level of fund disbursement

114. As of September 2025, of the total US \$43,062,981 approved so far (US \$41,121,089 for UNIDO, US \$891,892 for the Government of Italy, and US \$1,050,000 for the Government of Austria), US \$25,400,429 (62 per cent) had been transferred to FECO, and US \$28,111,274 (65 per cent) disbursed to final beneficiaries, as shown in table 4.

Table 4. Status of disbursements for stage II of the RAC sector plan as of September 2025 (US \$)

Particular	Tranche				Total	Disbursement rate (%)
	First	Second	Third	Fourth		
UNIDO						
Funds approved	14,671,089	16,000,000	4,150,000	6,300,000	41,121,089	62
Disbursed by agency	*13,127,000	7,923,936	2,032,082	2,317,411	25,400,429	
Disbursed by FECO**	13,399,534	8,878,758	3,772,522	2,034,735	28,085,549	68
Italy						
Funds approved	891,892	0	0	0	891,892	3

⁴ Annex II to the present document.

Particular	Tranche				Total	Disbursement rate (%)
	First	Second	Third	Fourth		
Disbursed by agency	25,725	0	0	0	25,725	
Austria						
Funds approved	0	0	350,000	700,000	1,050,000	0
Disbursed by agency	0	0	0	0	0	
Total						
Funds approved	15,562,981	16,000,000	4,500,000	7,000,000	43,062,981	59
Disbursed by agencies	13,152,725	7,923,936	2,032,082	2,317,411	25,426,154	
Disbursed to final beneficiaries	13,425,259	8,878,758	3,772,522	2,034,735	28,111,274	65

* At the 94th meeting, UNIDO had reported a higher level of disbursement as it had inadvertently included commitments in the disbursement reported to that meeting.

** Disbursement from FECO to final beneficiaries includes disbursement related to the PMU.

115. In line with decision 95/43(b), UNIDO confirmed that it has applied the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the RAC sector plan. UNIDO has closely monitored the level of funds disbursed to FECO and from FECO to beneficiaries. As shown in table 4 above, the total funds disbursed by FECO to final beneficiaries is higher than UNIDO's disbursement to FECO; UNIDO was planning to disburse an additional US \$10,380,283 to FECO by the 97th meeting in light of that shortfall, and FECO planned additional disbursements in 2025 of US \$3,933,329. The balance of funds held by FECO in January 2026 would thus be US \$3,761,834, which would represent 10.6 per cent of the total funding that will be disbursed by UNIDO to FECO through 2025. UNIDO will continue monitoring closely the disbursements by FECO to beneficiary enterprises before releasing additional funds.

Implementation plan for the fifth tranche of stage II of the room air-conditioning manufacturing and heat pump water heaters sector plan

116. The following activities will be implemented under the fifth tranche for UNIDO:

- (a) Support to enterprises that had converted to manufacturing R-290-based RAC units and HPWHs by providing IOCs (US \$3,699,997);
- (b) Technical assistance (US \$4,389,476):
 - (i) Verifications of completed manufacturing conversions (i.e., review and verify conversion activities, use of funds, and number of R-290 units produced and sold) (US \$112,000);
 - (ii) Completion of the three remaining and three new research and development projects on R-290 technology (US \$430,218);
 - (iii) Organize study tours to Southeast Asian countries to explore cooperation opportunities to promote R-290 technology in RAC and facilitate the HFC phase-down (US \$50,000);
 - (iv) Capacity-building for local environmental bureaus, relevant Government departments, and servicing enterprises on the safe and effective management of flammable refrigerants to ensure sustainability of the uptake of R-290 technology; training curricula will continue to be updated based on practical experiences, technological developments, and evolving policy requirements (US \$120,000);

- (v) Advancing market uptake of R-290 products through policy support and new initiatives; includes feasibility studies and pilot initiatives, and may include evaluating the integration of R-290 products into Government green procurement catalogues, partnering with online platforms to provide purchase incentives, and implementing targeted multimedia campaigns to raise awareness among consumers and industry stakeholders (US \$3,477,258);
- (vi) Conduct data surveys on small- and medium-sized enterprises that install R-290 RAC to understand their technical capacity to safely install R-290-based RAC units, analyze the feasibility of a complete phase-out of HCFC-22 in the industry in 2030, and develop future strategies for HFC phase-down (US \$200,000);
- (c) Continued support from CHEAA to assist UNIDO and FECO in the day-to-day operational management of the HPMP (US \$148,191); and
- (d) Project implementation and monitoring (US \$479,441): Project staff (US \$427,572); domestic travel (US \$20,456); domestic meetings (US \$16,906); consulting services (US \$12,072); and operating costs, including daily operating expenses, support staff, office facilities and equipment (US \$2,435).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Report on HCFC consumption and verification

117. China reported RAC manufacturing consumption of 1,375 ODP tonnes in 2023 and 2024, below the target of 1,614.1 ODP tonnes for those years.

Progress report on the implementation of the fourth tranche of stage II of the room air-conditioning manufacturing and heat pump water heaters sector plan

Legal framework

118. FECO will continue enforcing the quota permits to RAC enterprises consuming more than 100 mt of HCFCs per year.

119. The Secretariat noted with appreciation that in April 2025, the State Council approved the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025-2030). This strategic plan outlines the roadmap for the complete phase-out of HCFCs by 2030 and sets a target for a 10 per cent reduction of HFCs by 2029. Among other measures, it includes a prohibition on the manufacture of RAC charged with refrigerants with a global-warming potential (GWP) greater than 750 for domestic sales by 1 January 2029, except for household multi-split AC (heat pump) units; the use of R-290 is encouraged.

120. The prohibition on the manufacture and sale of R-410A-based (and other HFCs with a GWP above 750) RAC for domestic sales is a testament to China's commitment to implementing the Kigali Amendment. The Secretariat queried whether such prohibition could be also applied to manufacturing for export. UNIDO clarified that extending the prohibition to exports had not been considered because R-410A-based RAC units are relatively cheap and some less-developed countries still need such equipment as a transitional option; it remains uncertain whether all overseas markets will be ready to adopt flammable refrigerants such as HFC-32 and R-290 by 2029; and the formulation of export-related policies requires

coordination with the Ministry of Commerce, and such inter-ministerial discussions had not yet been initiated.

121. The Secretariat also sought to better understand how the use of R-290 would be encouraged under the plan and noted that the domestic RAC market has already largely shifted from R-410A to HFC-32: the greatest competition R-290 RAC faces in China's domestic market is not from R-410A but from HFC-32. It is therefore unlikely that the prohibition by itself will materially affect the market uptake of R-290 RAC technology in China's domestic market. UNIDO emphasized that the prohibition represents part of China's broader policy framework to promote low-GWP alternatives and to ensure a smooth transition towards compliance with the Kigali Amendment. While HFC-32 currently dominates the domestic market, the Government continues to encourage the development and deployment of R-290 RAC technology through various initiatives, including policy support, standard development, and pilot demonstrations. The prohibition on R-410A manufacturing for the domestic market is therefore one of several coordinated measures intended to create favourable conditions for the gradual market transformation toward lower-GWP- and R-290-based technologies. Regarding how R-290 would be encouraged under the plan, UNIDO indicated that specific measures were being considered and assessed, including green procurement programmes, energy efficiency standards, and financial incentive mechanisms to encourage wider adoption.

Revision to the incremental operating cost incentive scheme

122. Sales of R-290 split RAC units remain low in part because of the higher price of R-290-based compressors relative to HFC-32-based compressors. To overcome this barrier, UNIDO suggested to not annually decrease IOC by 50 per cent as agreed under decision 94/34(b)(i) but rather to maintain the IOC level at those agreed for 2025 (e.g., 55 RMB/unit for units with grade 1 energy efficiency), as: reducing the incentive would undermine manufacturers' ability to scale manufacturing and invest in R-290 technology; the economic downturn in the country has further constrained consumer spending, making consumers less willing to pay a premium for R-290 units; there is competition from HFC-32-based units, whose rapid adoption has significantly disrupted the original strategy for promoting R-290; and decreasing the IOCs would increase the risk of delaying R-290 sales and industry action. While sympathetic to the challenges faced by manufacturers and the concerns raised by UNIDO, the Secretariat was concerned that not implementing the agreed annual decrease could send a confusing signal to industry: if manufacturers can receive the same incentive now or in the future, they may choose to wait. Moreover, while agreeing that with increased manufacturing, component costs will decrease, enabling R-290 units to become cost-competitive without subsidies, the Secretariat considered that there are mechanisms other than the IOC incentive scheme that China could use to encourage the manufacture and sales of R-290 RAC units.

123. The Secretariat considered the proposal to partner with online platforms to be an innovative alternative approach to provide the agreed IOC incentive: rather than provide the incentive to manufacturers, the incentive would be provided to the marketers and distributors of the equipment, thereby providing a more direct connection to the consumer. UNIDO confirmed that the total incentive to be provided would be in line with that specified under decision 94/34(b)(i) irrespective of whether that is provided to the manufacturer, via the online platform, or some combination thereof.

Consideration of measures described in paragraph 32 of document UNEP/OzL.Pro/ExCom/94/29 (decision 94/34(d)(iii))

124. In line with decision 94/34(d)(iii), China continued to consider and implement measures to facilitate the manufacture and market uptake of R-290 split-type RAC units. A range of policy, market, and servicing initiatives are under discussion or development that aim to create a comprehensive enabling environment for the sustainable manufacturing, deployment, and servicing of R-290 split-type air conditioners in China, including:

- (a) A ban on the manufacture of R-410A-based RAC units for the domestic market by 1 January 2029, and a freeze on quotas for manufacturers using refrigerants with a GWP higher than 750 by 2028; and
- (b) Review and update to the national safety standards related to the use of flammable refrigerants to further support the safe adoption of R-290 technology.

125. Complementary initiatives that are being explored include collaboration with the International Copper Association to enhance the visibility of R-290 products; engagement with major online shopping platforms to increase consumer awareness and accessibility, and a feasibility study on integrating R-290 RAC into public procurement programmes to lead market transformation through green purchasing. Further, a series of capacity-building and safety-enhancement activities are planned or ongoing under the servicing HPMP, including after-sales training during installation, training on new standards related to the transportation of RAC charged with flammable refrigerants, and dedicated courses on the safe handling of R-290 during servicing operations. Efforts are also being made to improve the availability of appropriate tools and equipment for flammable refrigerants and to strengthen refrigerant recovery, recycling, and reuse practices.

126. At the 94th meeting, the Secretariat had noted with appreciation the promulgation of the list of recommended ODS alternatives, which included R-290 among the list of recommended alternatives for the sector, and excluded HFC-32, the dominant technology in the sector, as well as R-410A.⁵ While noting that FECO may not be able to dictate Government and provincial government procurement policies, the successful implementation of the RAC sector plan is a Government priority and ensuring that Government, including provincial government, procurement follows the recommended list of ODS alternatives for RAC could meaningfully advance that priority. Accordingly, the Secretariat invited UNIDO and FECO to consider feasible mechanisms to ensure that Government, including provincial government, procurement follows the recommended list of ODS alternatives for RAC. UNIDO and FECO confirmed that they would cooperate with other relevant ministries, including the Ministry of Industry and Information Technology, to develop a feasibility study to implement such a procurement policy that will be sent to the Ministry of Finance for review and consideration.

Conversions to R-290 with enterprises' own funding

127. In addition to the manufacturers AUX and Zhongshan Amite that had converted their RAC and HPWH manufacturing lines to R-290,⁶ three RAC manufacturers had converted seven of their manufacturing lines with an aggregated manufacturing capacity of 5.2 million units per year to R-290, and one HPWH manufacturer had converted one of its manufacturing lines with a manufacturing capacity of 30,000 units to R-290 with its own resources. The Secretariat considers the decision by manufacturers to use their own resources to convert to R-290 to be an important signal by industry of confidence that the market is ready to accept R-290 technology.

Estimate of tonnage of possible HFCs phased in by Multilateral Fund-assisted enterprises (decision 94/34(c))

128. The Secretariat and UNIDO had detailed discussions on an approach to estimate the tonnage of possible HFCs phased in by Multilateral Fund-assisted enterprises to meet the demand associated with the HCFC-based manufacturing capacity converted to R-290 under the HPMP RAC sector plan. A total of 30 manufacturing lines with an aggregated capacity of 18,348,000 RAC units have to date been converted to R-290 under stage I and stage II of the RAC sector plan. Of those 30 lines, 20 had completed their conversion by 1 January 2023, with an aggregated capacity of 10,375,472 R-290 units in 2020, and

⁵ UNEP/OzL.Pro/ExCom/94/29

⁶ See table 2

11,796,305 R-290 units in 2021 and 2022; those lines manufactured a total of 201,526 R-290 RAC units in the 2020-2022 period.

129. While information on the number of R-290 RAC units manufactured in the 2020–2022 period was available at those lines, information was not available on an enterprise basis on HFC manufacturing capacity, HFC capacity utilization, and the relative proportion of R-410A- and HFC-32-based AC units manufactured in that period. UNIDO therefore provided the following industry-wide data:

- (a) China's RAC manufacturing capacity increased from 245 million units in 2020 to 246 million units in 2021, and to 248 million units in 2022. RAC manufacturing (all refrigerants) in those years was 144 million, 157 million, and 154 million units, respectively. RAC manufacturing capacity utilization was 58.8 per cent in 2020, 63.8 per cent in 2021, and 62.1 per cent in 2022, reflecting fluctuations in market demand; and
- (b) Manufacturing of HFC-based RAC was 134.97 million units in 2020, 149.53 million units in 2021, and 141.61 million units in 2022. R-410A accounted for 23.1 per cent of that manufacturing in 2020, 20.4 per cent in 2021, and 21.6 per cent in 2022, while HFC-32 was 69.2 per cent in 2020, 68.6 per cent in 2021, and 74.9 per cent in 2022.

130. The increased uptake of HFC-32 relative to R-410A is consistent with China's ratification of the Kigali Amendment, the higher price of R-410A relative to HFC-32, the excellent performance and energy efficiency of HFC-32-based units, the smaller refrigerant charge of HFC-32 relative to R-410A, and the gradual expiration of HFC-32 patents.

131. UNIDO further noted that the 20 converted lines had manufactured 1,918,024, 1,954,138, and 1,103,835 R-290 factory-sealed units in 2020, 2021, and 2022, respectively, and suggested that this manufacturing should be taken into account when estimating the tonnage of possible HFCs phased in by Multilateral Fund-assisted enterprises.

132. The Secretariat estimated that between 2020 and 2022, the average HFCs phased in to meet the demand associated with the HCFC-based manufacturing capacity converted to R-290 under the HPMP RAC sector plan that was idle was between 4.75 million CO₂-eq tonnes and 5.57 million CO₂-eq tonnes, based on the following assumptions, and as further summarized in annex III to the present document:

- (a) The average charge per unit with HCFC-22 was 1.14 kg/unit, with an estimated 30 per cent reduction in charge when converting to R-410A or HFC-32;
- (b) The proportion of R-410A- and HFC-32-based manufacturing was normalized based on the relative manufacturing of each refrigerant provided by UNIDO by year; and
- (c) The converted lines would have manufactured R-290 RAC units at approximately the same capacity utilization as the RAC manufacturing industry in general. In that regard, immediately prior to conversion, the converted lines had an average and median capacity utilization of 64 and 71 per cent, which is higher than the industry average (of 58.8 to 63.8 per cent). Such higher capacity utilization could be seen as a more representative capacity utilization for the high-end scenario presented by the Secretariat.

133. It is not clear that factory-sealed R-290 RAC units are fungible with HFC-32- and R-410A-based RAC units. While it is laudable that the converted lines have found limited use to manufacture portable R-290-based RAC units, it is unlikely that such manufacturing will materially affect the demand for HFC-32-based and R-410A-based split AC units, which dominate both the market in China and in many other Article 5 countries. Moreover, the Secretariat assumed the converted lines would be used at the same

capacity utilization rate as other manufacturing lines and it is not clear that the unused capacity (i.e., approximately 40 per cent) could not be used to manufacture factory-sealed units. The Secretariat has therefore considered two scenarios: one where the factory-sealed R-290 RAC units are considered fungible (i.e., such equipment would offset demand for HFC-based RAC units) and one where they are not (i.e., demand for HFC-based RAC units would be independent of such manufacturing), resulting in a low-end and a high-end estimate for the demand associated with the idle converted R-290 manufacturing capacity.

134. The Secretariat noted that notwithstanding best efforts, there was some uncertainty in the industry-wide data as evidenced by discrepancies between estimated HCFC-22 consumption for RAC manufacturing and that reported by the country, and minor internal inconsistencies in the data provided.

135. UNIDO concurred that some uncertainty in the data was inevitable and considered that the assumptions used—particularly regarding charge size, capacity utilization, and market fungibility—were critical to estimating the potential HFC demand associated with the converted R-290 manufacturing capacity that had remained idle. UNIDO also emphasized that the utilization of capacity of the converted R-290 lines had been constrained not only by market factors but also by safety and flammability concerns. Consequently, assuming equivalence between the utilization of converted R-290 lines and that of the general RAC industry may overstate the substitution effect. Furthermore, recent data indicate a gradual increase in the adoption of factory-sealed R-290 RAC units, but their market segment remains niche and does not overlap directly with the split-type HFC-32 or R-410A systems. Therefore, UNIDO concurred that the fungibility between those product types is limited. UNIDO considered the Secretariat's two-scenario approach as a prudent means to capture this uncertainty and suggested that continued monitoring of manufacturing, market trends, and technology deployment under the HPMP framework will help refine these estimates and support a more accurate assessment of the climate benefits of R-290 transition in the RAC sector.

“Clean Cooling Hub,” in cooperation with the Government of Austria

136. The Secretariat sought to better understand the reasons for the delay in implementation of the Government of Austria's bilateral project and sought assurance that the project would be completed in line with the date of completion of the project so that China could benefit from the planned assistance. UNIDO reiterated the Government of Austria's commitment to complete all activities by the date of completion of stage II and explained that the delay was primarily due to the complexity of establishing a bilateral cooperation framework involving the Austrian Government, FECO, and UNIDO, and the administrative procedures required to finalize the Trust Fund Agreement (TFA). Following the TFA, a detailed preparatory phase was required to align technical scope and implementation modalities between stakeholders in Austria and China. While these preparatory activities did not trigger disbursements, they have now been completed. Draft terms of reference and a technical proposal have been finalized and are under internal review, with contract finalization expected by the end of 2025 and implementation beginning in early 2026. Planned activities include the development of specialized training modules on the safe installation, servicing, and maintenance of R-290 RAC, including flammability risk mitigation, targeting technicians and trainers in China; demonstration of European best practices in training delivery, curricula, and equipment handling for R-290 technologies, tailored to the China context; joint development of training materials and toolkits to support national ozone units (NOUs) and manufacturers in building technician readiness across the supply chain; knowledge exchange workshops and technical site visits for Chinese stakeholders (e.g. FECO, manufacturers, training centres) to observe R-290 uptake in the Austrian and European context; and development of modular training content that can be adapted and disseminated within China's vocational training ecosystem. As appropriate, the project may also seek to implement innovative approaches to market uptake of R-290 RAC, such as through virtual safety training simulations or showcasing solar-powered R-290 AC demonstration units for off-grid or hybrid applications.

Level of fund disbursement

137. Noting that only 3 per cent of the funding approved under the first tranche for bilateral cooperation with the Government of Italy had been disbursed, the Secretariat inquired about the reasons for the limited progress and the corrective actions taken and requested a plan of action clearly identifying how the remaining balances will be used, including budget and timeline by activity.

138. The Government of Italy clarified that the limited progress was due to the need for extended coordination between Italy's Ministry of Environment and Energy Security, FECO, and UNIDO to agree on a workplan and governance structure; the need to revise the original scope of technical assistance to align with current priorities, following feedback from FECO; COVID-19 restrictions; and the need to synchronize the implementation timeline with ongoing activities and bilateral project procedures. Implementation was reactivated in 2024, including three coordination meetings to develop a workplan, and four expert positions (two international experts from Italy, two national experts from China) have been finalized, with recruitment for those positions underway. Additional disbursement is planned for December 2025 following the signature of contracts and commencement of research activities and is expected to increase substantially during 2026 in line with the plan of action indicated in table 5.

Table 5. Plan of action for Italy's bilateral assistance

Activity	Description	Timeline	Budget (US \$)
Research and development on R-290 and CO ₂ heat pump technologies	Collaborative research between Italian and Chinese experts on safety, charge reduction, efficiency, and optimized component design.	2025–2026	400,000
Sustainable Cooling Workshop ("Kigali in Action")	Includes opening session by Italy and side event launching the Net-Zero-Emission Initiative for Cooling Enterprises by 2050.	April 2026	150,000
Training in Italy	Training on R-290 AC and heat pump promotion and market acceptance for NOUs and master trainers from African countries.	February 2026	75,000
Training in China	Training for R-290 and heat pump application and energy efficiency improvement for ASEAN* NOUs and trainers, with Italian experts' participation.	February 2026	75,000
Total			700,000

* Association of Southeast Asian Nations

Gender policy implementation

139. The Government of China continues to incorporate gender mainstreaming into the implementation of the RAC sector plan. Under the fourth tranche, manufacturers focused on improving women's participation and empowerment: at Midea, the number of female workers increased to above 30 per cent; at TCL, the enterprise has set up women-only spaces in their factories for female workers; and CHEAA has incorporated awareness-raising on the issue into their training programme and included a special training specifically for women.

Sustainability of the HCFC phase-out and assessment of risks

140. The most significant risk to the project remains that the manufacturing lines that converted to R-290 continue to be largely idle due to continued limited uptake of R-290-based RAC equipment in China and in markets around the world. While annual manufacturing of R-290 split RAC remains substantially below the converted capacity, part of that capacity is being used to manufacture factory-sealed R-290 AC units, which will build confidence in the technology and help build up the supply chain for R-290 products. Similarly, the conversion of HPWH manufacturing lines to R-290, and the sale of such equipment, while mostly for export, will help build confidence in the technology.

141. The higher price of R-290-based compressors relative to HFC-32-based compressors remains a key challenge given the sensitivity of consumers to the price of split RAC units. Mass manufacturing of R-290 compressors would help reduce that price differential. While the implementation of Government procurement would be helpful, by itself it would be unlikely to spur enough demand to enable such mass manufacturing. Rather, joint and parallel implementation of Government procurement and activities being planned under the HPMP, including building the capacity of installers and technicians, awareness-raising, pilot installations, partnering with online platforms, and the implementation of the IOC incentive scheme could help spur demand. In addition, HFC-32-based manufacturing, the primary competition for R-290, will be restricted by the implementation of China's HFC quota system; manufacturing of R-410A will similarly be restricted by the implementation of quota system, as well as the upcoming prohibition on manufacturing for the domestic market of RAC based on HFCs with a GWP greater than 750. The Secretariat notes with appreciation that the HFC quota system and upcoming prohibition were implemented without Multilateral Fund assistance and in line with China's implementation of the Kigali Amendment.

142. Continued progress in updating relevant safety standards will similarly build confidence in the technology, and continued research and development will help reduce costs and refrigerant charge, while increasing energy efficiency and safety. Approval of the fifth tranche at this meeting would also help minimize the risk of a delay in the transfer of funding from UNIDO to FECO in the event there was a rapid uptake of R-290 split AC in the market.

143. In the absence of corrective measures, there was a risk that the planned bilateral activities to be undertaken with the Governments of Austria and Italy would not be completed by the date of completion of stage II of the RAC sector plan, which would deprive China of the benefit of the planned assistance. The Governments of Austria and Italy have presented workplans that aim to substantially accelerate implementation, and committed to ensuring the planned activities will be completed by the date of completion of stage II of the RAC sector plan.

Conclusion

144. Implementation of the first four tranches of stage II of the RAC sector plan is progressing, including the conversion of twelve RAC manufacturing lines, four compressor manufacturing lines, and four HPWH manufacturing lines. A broad range of technical assistance activities have either been completed or are in an advanced stage of implementation. The decision of enterprises to convert eight RAC and eight HPWH manufacturing lines to R-290 with their own resources is an important signal by industry of confidence that the market is increasingly ready to accept R-290 technology. The level of disbursement of the funds approved in the fourth tranche is 29 per cent.

145. Notwithstanding continued efforts by the Government of China, CHEAA, industry and UNIDO, manufacturing of R-290 RAC split units on the converted lines continues to be very low, reflecting limited local and global market penetration; in contrast, R-290 is well-established for factory-sealed equipment. The decision by the Government of China not to use the IOC incentive scheme for factory-sealed equipment, but to instead focus the IOC incentive scheme on R-290 split units, reflects the Government's commitment to ensure the successful uptake of the technology. The continued implementation of activities, including partnering with online platforms and the provision of IOCs to help facilitate the sale of energy efficient, R-290 split AC units; research and development activities to help lower the cost of R-290 technology; and development of policies and regulations to promote the market uptake of R-290 split RAC units in China, including those planned under stage II, will likely be required to ensure a sustained and substantial market uptake of R-290. The sustained manufacturing of R-290 split AC equipment in China will also be furthered by the acceptance of the technology in other markets.

RECOMMENDATION

146. The Executive Committee may wish:

- (a) To note the progress report on the implementation of the fourth tranche of the room air-conditioning manufacturing and heat pump water heaters sector plan (RAC sector plan) of stage II of the HCFC phase-out management plan (HPMP) for China;
- (b) To consider the approach developed by the Secretariat, in consultation with UNIDO and in line with decision 94/34(c), to estimate the tonnage of possible HFCs phased in by Multilateral Fund-assisted enterprises to meet the demand associated with the HCFC-based manufacturing capacity converted to R-290 under the HPMP RAC sector plan contained in document UNEP/OzL.Pro/ExCom/94/29; and
- (c) To approve the fifth tranche of the RAC sector plan of stage II of the HPMP for China, and the corresponding 2025–2026 tranche implementation plan, in the amount of US \$8,717,105, plus agency support costs of US \$610,197, 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	Approved: 76 th Revised: 86 th	100% phase-out by 2026

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2024	7,487.16 ODP tonnes
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2024
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		605.00	2,695.00	2,767.1		6,067.10
HCFC-123			7.02	1.56		8.57
HCFC-124				-0.07		-0.07
HCFC-141b		1,042.69			121.00	1,163.69
HCFC-142b		97.50	3.58	129.71		230.79

(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		2025	2026	2027	Total
UNDP	ODS phase-out (ODP tonnes)	9.32	0.0	0.0	9.32
	Funding (US \$)	560,071	0	0	560,071

(VI) PROJECT DATA			2016	2017	2018 – 2019	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	1,000,000	2,000,000	0			25,045,909
		Support costs	197,536	264,403	0	906,275	175,000	70,000	140,000	0			1,753,214
Total funds recommended for approval at this meeting (US \$)		Project costs									523,431		523,431
		Support costs									36,640		36,640

* 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
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PROJECT DESCRIPTION

147. On behalf of the Government of China, UNDP, as the designated implementing agency, has submitted a request for funding for the seventh and final tranche of the solvent sector plan of stage II of the HCFC phase-out management plan (HPMP), at the amount of US \$523,431, plus agency support costs of US \$36,640.¹ The submission includes a progress report on the implementation of the sixth tranche of the solvent sector plan, verification reports in line with subparagraph 5(c) of the Agreement between the Government of China and the Executive Committee, and the tranche implementation plan for 2025-2026.

148. 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. A revised plan of action for 2021-2026 was approved at the 86th meeting² and comprised policy and regulatory interventions, technical assistance, project management activities and investment activities to convert 18 small- and medium-sized enterprises (SMEs) in the disposable medical devices (DMD) subsector and seven SMEs in the electronic degreasing subsector, 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 for 24 enterprises as originally approved (US \$13.00/kg). All enterprises will be using alternatives with low global-warming potential (GWP) (e.g., hydrocarbons or diluents, trans-1, 2-dichloroethylene and hydrofluoroethers, 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 3 million CO₂-equivalent tonnes.

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

149. The work plan of the solvent sector activities covering 2024-2025 (for the sixth tranche) was signed in 2023 between FECO and UNDP.

Regulatory activities

150. FECO has continued to issue quota permits to solvent enterprises and, as reported in the previous progress report, had issued a circular 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; and issued a ban on the use of HCFCs in the DMD subsector which has been enforced since 1 December 2023.

151. A contract was signed with Beijing University of Chemical Technology to study the ban on using HCFCs in the solvent sector in China. After completion of a survey and 40 site-visits a report was drafted and is currently under review. The ban is expected to be in force from July 2026. A contract was also signed with China Electronic Components Association to prepare the technical guidelines for conversions in the metal and electronics subsectors. Draft technical guidelines were submitted for review and are expected to be finalized by the end of 2025.

¹ As per the letter of 12 September 2025 from the Ministry of Ecology and the Environment of China to UNDP.

² 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 (decisions 86/34 and 86/40).

Investment activities

152. Out of the 53 solvent enterprises that initially signed contracts with FECO in three batches, their implementation progress as of August 2025, is summarized below:

- (a) From the first batch of 24 enterprises, comprising 514 manufacturing lines and phasing out 1,176.2 mt (129.4 ODP tonnes) of HCFC-141b consumption, 22 received national acceptance; one enterprise had withdrawn from the project due to closure in 2020³ and another had completed procurement and installation but subsequently withdrew from the project due to temporary closure in 2023;⁴
- (b) The second batch of 25 eligible enterprises, including 18 in the DMD subsector and seven in the metal and electronics subsectors, encompasses 347 manufacturing lines and comprises mostly SMEs with annual consumption of no more than 5 mt of HCFC-141b. All have completed conversion activities, passed national acceptance, and verified the phase out of 372.2 mt (40.9 ODP tonnes) of HCFC-141b. Five of the seven enterprises from the metal and electronics subsectors are using solvent-free alternatives and therefore did not incur incremental operating costs (IOCs) and all funding was invested in the incremental capital costs; and
- (c) The third batch includes four solvent enterprises, covering 30 manufacturing lines, which will phase out 141.91 mt (15.6 ODP tonnes) of HCFC-141b consumption. Among these enterprises, two are from the solvent formulation subsector and the other two are from the metal and electronic subsectors. Of the four enterprises three of them converted to water-based technology and one to HC-HFE based technology and three of them have completed manufacturing line conversions and the remaining one is conducting the procurement of equipment and conversion is expected to be completed by March 2026.

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

Table 1. Status of progress of enterprise conversions in the solvent sector

Status of implementation	# of enterpr.	HCFC-141b consumption*		Contract value (US \$)	Status of conversion
		mt	ODP tonnes		
First batch of enterprises**	22	1,176.2	129.4	17,657,765	Completed
Second batch of enterprises	25	372.2	40.9	2,000,907	Completed implementation and passed the national acceptance
Third batch of enterprises	4	141.91	15.6	2,240,804	Three (3) enterprises completed production conversions and one (1) is procuring equipment
Total	51	1,690.31	185.9	21,899,476	n/a

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

** Two enterprises withdrew with 15.9 ODP tonnes (144.8 mt) of consumption considered phased out and US \$2,382,781 was reallocated to the third batch of projects.

³ One beneficiary (Dechang Beihai) withdrew its participation in the HPMP due to closure thereby eliminating the enterprise's consumption; thus, the overall phase-out of HCFC-141b remains unchanged. The contract value for this enterprise of US \$1,846,784 was reallocated to the third batch of enterprises.

⁴ FECO decided to terminate the contract with one beneficiary (Jiangsu Yile) due to a temporary shutdown of the factory. The enterprise was not required to return funds already disbursed, as the first payment of US \$85,200 was used in converting the manufacturing line and the first milestone was met; the enterprise is no longer using HCFC-141b; and when it reopens it will need to comply with the HCFC ban for the DMD subsector. The remaining US \$535,997 was reallocated to the third batch of enterprises.

Verification of converted manufacturing lines

154. As of December 2023, all 25 enterprises from the second batch had completed their conversion activities and passed the national acceptance. The verification exercise is based on the projects completed between July 2023 and June 2024, in accordance with subparagraph 5(c)⁵ of the Agreement. The two verification reports confirmed, inter alia, that two enterprises had a total of 27 converted lines with a total phase-out of 52.31 mt (5.75 ODP tonnes), representing 14 per cent of the total HCFC-141b phased out and 8 per cent of the manufacturing lines in the second batch of projects. Both enterprises introduced solvent-free, clean-air alternatives, and in one case, this was in combination with trans-1,2-dichloroethylene. Both enterprises have completely stopped using HCFC-141b and destroyed the replaced baseline equipment, as verified through documentation confirming its disposal and through consultations with FECO, MEE, and relevant personnel from each enterprise. For the enterprise using only solvent-free, clean-air technology, no IOCs were paid and for the other enterprise, the payment of IOCs was made after confirmation that the manufacturing lines were operational for at least six months after the trial run was completed.

Technical assistance activities

155. The following technical assistance activities were implemented between 2024 and 2025:

- (a) FECO initiated the procurements and signed a contract with the accounting firm LiXin to conduct baseline consumption and performance verification for the third batch of projects, which will serve as the reference during the project evaluation;
- (b) FECO signed a contract with the implementation support agency (ISA) to assist the four enterprises in conducting HCFC phase-out activities under the third batch of projects. The ISA interacted closely with FECO to provide appropriate technical guidance and to identify and find collaborative solutions for technical issues; and
- (c) A contract was signed with the China Cleaning Industry Association to conduct training on alternative technologies for the DMD, metal, electronics and solvent formulation subsectors to improve knowledge and build practical skills to reduce the environmental and safety risks in the practice. As the ban on HCFCs in the solvent sector takes effect in 2026, the association will begin to conduct training activities in each subsector.

Level of fund disbursement

156. As of September 2025, of the US \$25,045,909 approved so far, US \$23,912,909 had been disbursed by UNDP to FECO, and US \$23,078,529 (92 per cent) by FECO to beneficiaries, as shown in table 2. The balance of US \$1,967,380 will be disbursed in 2026.

Table 2. Status of disbursement for stage II of the solvent sector plan as of September 2025 (US \$)

Description		Tr. 1	Tr. 2	Tr. 3	Tr. 4	Tr. 5	Tr. 6	Total
Funds approved for UNDP		2,821,937	3,777,190	12,946,782	2,500,000	1,000,000	2,000,000	25,045,909
Disb. from UNDP to FECO	Total	2,796,937	3,742,190	12,946,782	2,466,000	979,000	982,000	23,912,909
	Ratio (%)	100	100	100	99	98	49	95
Disb. from FECO to beneficiaries	Total	2,796,937	3,742,190	12,946,782	2,141,265	614,207	837,148	23,078,529
	Ratio (%)	99	99	100	86	61	42	92
Fund balance		25,000	35,000	0	358,735	385,793	1,162,852	1,967,380

⁵ 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.

157. In line with decision 95/43(b), UNDP confirmed that it has applied the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the solvent sector plan. UNDP has closely monitored the level of funds disbursed to FECO and from FECO to beneficiaries. As shown in table 2, the current balance of funds kept by FECO is US \$834,380, which represents 3.5 per cent of the total funding that has been transferred by UNDP to FECO. UNDP will continue monitoring closely the disbursements by FECO to beneficiary enterprises before releasing additional funds.

Implementation plan for the seventh and final tranche of stage II of the solvent sector plan

158. The following activities will be implemented by UNDP until December 2026:

- (a) Policy actions: FECO will continue to enforce quota management in the solvent sector, and collaborate with the local ecology and environment bureaus (EEBs) to strengthen the registration system for HCFC consumption and sales and EEBs will continue to conduct inspections to support the enforcement of the ban on the use of HCFCs in the DMD subsector, in force as of 1 December 2023; EEBs and beneficiary enterprises will receive technical support from the ISA as necessary for effective implementation of the ban; the final report on the ban for using HCFCs in the solvent sector will be finalized and the ban will come into force in July 2026 (ongoing activities);
- (b) Ongoing enterprise-level activities: The conversion activities in the final enterprise will be completed, and performance verifications to receive national acceptance will be conducted for the four enterprises; disbursements will be made to enterprises after milestones stipulated in the conversion contracts are achieved (US \$212,220);
- (c) Technical assistance activities: ISA will continue providing technical and management support for the third batch of projects; using the previously developed technical guidelines for the application of hydrocarbon and chlorinated solvent as degreasers and the technical guidelines for HCFC conversions in the metal and electronics subsectors as a foundation, standards for the solvent sector will be developed for the adoption of alternative technologies; an evaluation of the HPMP to review and summarize the outcomes of the implementation of the solvent sector plan, including the energy efficiency of cleaning equipment, the use of low-GWP alternatives, the direct emission reduction, and the economic and social impact of HCFC phase-out in the solvent sector; public awareness activities to publicize HCFC-alternatives and the sustainable compliance targets (US \$282,423); and
- (d) Project management (US \$28,788): Project management costs will cover project staff (US \$9,272), travel (US \$1,365), meetings and consultancy services (US \$1,745) and operational costs (US \$16,406).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Report on HCFC consumption

159. The consumption of HCFCs in the solvent sector in 2024 was reported at 1,100 mt (121 ODP tonnes), which is below the maximum allowable consumption established in the Agreement between the Government of China and the Executive Committee, as shown in table 3.

Table 3. Consumption of HCFCs in the solvent sector

Description		2020	2021	2022	2023	2024
Consumption *	mt	2,800.00	2,500.00	2,500.00	1,100.00	1,100.00
	ODP tonnes	308.00	275.00	275.00	121.00	121.00
Maximum allowable consumption **	mt	2,944.91	2,944.91	2,944.91	1,359.19	1,359.19
	ODP tonnes	321.2	321.2	321.2	148.3	148.3
Phase-out targets	mt	679.60	n/a	n/a	1,585.72	n/a
	ODP tonnes	74.16	n/a	n/a	172.97	n/a

* As per the country programme implementation report.

** As per the Agreement revised at the 86th meeting for stage II from 2016-2026.

160. Reductions in consumption since 2018 have been achieved through the conversion of solvent enterprises; strict implementation of production, domestic sales, and consumption quotas required for manufacturing enterprises consuming over 100 mt of HCFCs; mandatory registration of enterprises; and the involvement of EEBs in supervision and monitoring in the subsector. 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 under the first and second batch of enterprises in stage II also contributed to the reduction in HCFC-141b consumption. Through the technical assistance component, the Government continues to strengthen the industry's technical capacity to adopt low-GWP alternatives to ensure that further reductions are achieved and sustained. The Government has implemented the ban on the use of HCFC-141b for the DMD subsector since 1 December 2023 and the ban on the use of HCFCs in the solvent sector will be effective from 1 July 2026; with this the consumption of HCFCs in solvent sector will be phased out.

Status of implementation of activities

161. On the development of the technical guidelines for the use of hydrocarbon and chlorinated solvents as a degreaser, UNDP explained that the guidelines have been completed. Training was also conducted for relevant enterprises based on the guidelines with over 80 participants. The guidelines are being publicized on the website of industry association for free access.

162. On the implementation of the prohibition on the use of HCFCs in the solvent sector and the sustainable transition to alternatives, UNDP confirmed that the prohibition would be enforced from 1 July 2026. Training activities were undertaken for the local EEBs focusing on raising awareness of the national plans for achieving HCFC phase-out in solvent applications, and regulations for phasing out HCFCs in the solvent sector. The technical guidelines on alternatives were also prepared and publicized so that end users are better prepared for managing the HCFC ban in the sector.

Project implementation and monitoring

163. As the lead implementing agency for the HPMP in China, UNDP provided a cumulative report on the project management unit (PMU) expenditures, in line with decision 81/46(b). The PMU expenditures related to stage II of the solvent sector plan are summarized in table 4.

Table 4. PMU cumulative expenditures for stage II of the solvent sector plan in China (2017-2024)

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	730,930
	Domestic travel	77,794
	International travel	6,756
	Domestic meetings	58,498
	International meetings	
	Consulting service	46,310
Subtotal for sector-specific costs		920,288

Item	Description	Cost (US \$)
Operational costs	Support staff, computers, internet, printing, office operation and maintenance (shared costs)	906,405
Total disbursement		1,826,693

Gender policy implementation

164. In line with decisions 84/92(d) and 90/48(c) on the Multilateral Fund gender mainstreaming policy, the implementation of stage II of the solvent sector plan will continue to take into account women's participation. Engagement of women will be sought and encouraged in all project stages, including planning, policy and decision making, monitoring and evaluation. Disaggregated data will be collected from training and workshops. Capacity-building activities will take into consideration the participation of women during the technical assistance activities, including in outreach and training materials, promoting equity when applicable, and discussing women's related issues during the thematic workshops to share experiences and lessons learned. The Government will continue to take steps to maximize the involvement of women in the project activities during the implementation of the last tranche during the 2025-2026 period through outreach and capacity-building activities.

Completion of stage II of the solvent sector plan

165. UNDP has confirmed that stage II of the solvent sector plan will be completed by December 2027 as established in paragraph 14 of the Agreement.

Sustainability of the HCFC phase-out and assessment of risks

166. The sustainability of the HCFC phase-out in the solvent sector has been considered throughout the implementation of the project. The Government provided support to the industries using HCFCs in different solvent applications in the form of project funding support, as well as the dissemination of technical information through outreach, which will help in the safe adoption of different alternatives to HCFCs. Specific characteristics of industries such as DMD, electronics, and metal degreasing were taken into consideration, and technical support was provided accordingly. SMEs, which have limited technical and financial capacity, were supported and this reduced the risks of their transition to safe and sustainable alternatives. The risk of non-compliance with regulations was mitigated through training and capacity building of local EEBs and targeted awareness/technical information outreach programmes for the adoption of alternatives. The above activities will facilitate the effective implementation of the phase-out of HCFCs in the solvent sector by 1 July 2026 and the ban that will come into force by 1 July 2026 will help sustain HCFC phase-out in the solvent sector.

Conclusion

167. The Government of China remains in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the solvent sector plan, including with the consumption targets agreed for 2023 and 2024. Significant progress achieved in the implementation of stage II of the sector plan so far includes the full conversion of 47 enterprises with an associated phase-out of 1,548.4 mt (170.3 ODP tonnes) of HCFC-141b. During the sixth tranche implementation, an additional four enterprises were covered. Of these, three enterprises have completed the conversion, and one enterprise is expected to complete the conversion by the first quarter of 2026. The phase-out associated with these four enterprises is 141.91 mt (15.61 ODP tonnes). The findings of the verification of two enterprises submitted to this meeting have been positive and noted that the enterprises have fully converted and are operating using the agreed alternatives. About 42 per cent of the funds approved for the sixth tranche have been disbursed to the beneficiary enterprises. The seventh tranche will include technical assistance with relevant stakeholders on regulations for HCFC phase-out and technical support for the adoption of alternative technologies, the

formulation of standards for the solvent sector the adoption of alternative technology, and continued monitoring support for sustaining the HCFC phaseout in solvent sector.

RECOMMENDATION

168. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the sixth tranche of the solvent sector plan of stage II of the HCFC phase-out management plan (HPMP) for China;
- (b) Requesting the Government of China and UNDP to submit, on a yearly basis, progress reports on the implementation of the work programme associated and with the final tranche through completion of project, enterprise verification reports, and the project completion report to the first meeting of 2028; and
- (c) Approving the seventh and final tranche of the solvent sector plan of stage II of the HPMP for China, and the corresponding 2025-2026 tranche implementation plan, in the amount of US \$523,431, plus agency support costs of US \$36,640 for UNDP.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II) servicing sector	UNEP (lead), Germany and Japan	Approved: 76 th Revised: 86 th	n/a

(II) LATEST ARTICLE 7 DATA (Annex C, Group I)	Year: 2024	7,487.16 ODP tonnes
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2024
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		605.00	2,695.00	2,767.1		6,067.10
HCFC-123			7.02	1.56		8.57
HCFC-124				-0.07		-0.07
HCFC-141b		1,042.69			121.00	1,163.69
HCFC-142b		97.50	3.58	129.71		230.79

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

(V) ENDORSED BUSINESS PLAN		2025	2026	2027	Total
UNEP	ODS phase-out (ODP tonnes)	31.06	65.16	0.0	96.22
	Funding (US \$)	1,331,680	2,793,316	0	4,124,996
Germany	ODS phase-out (ODP tonnes)	0.0	0.0	0.0	0.0
	Funding (US \$)	0	0	0	0
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	2,000,000	2,000,000	3,000,000	0	0	16,329,132
		Support costs	411,051	0	294,461	120,000	0	229,613	221,403	219,467	329,200	0	0	1,825,195
Total funds recommended for approval at this meeting (US \$)		Project costs										1,200,000		1,200,000
		Support costs											131,680	

* 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
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PROJECT DESCRIPTION

169. On behalf of the Government of China, UNEP as the lead implementing agency, has submitted a request for funding for the eighth tranche of the refrigeration and air-conditioning servicing sector and the national enabling programme,¹ in the amount of US \$1,200,000, plus agency support costs of US \$131,680 for UNEP only.² The submission includes a progress report on the implementation of the seventh tranche, and the tranche implementation plan for 2026 to 2027.

170. This submission is based on the revised plan of action for the refrigeration servicing sector for the period 2021-2026 in the total amount of US \$12,717,105, plus agency support costs, as approved by the Executive Committee at the 86th meeting.³ Stage II of the refrigeration servicing sector plan comprises a component related to phase-out activities in the servicing 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 illegal trade in ozone-depleting substances (ODSs).⁴

Progress report on the implementation of the seventh tranche of stage II of the servicing sector plan

171. As of September 2025, the following activities were implemented:

- (a) The project cooperation agreement (PCA) for the seventh tranche, was signed in June 2025 between UNEP and the Foreign Environmental Cooperation Centre (FECO) and the first installment of US \$650,000 under this PCA was transferred from UNEP to FECO on 9 July 2025;
- (b) Based on findings from the survey of cold storage and commercial refrigeration end users, which highlighted equipment diversity and inconsistent naming, an effort was launched to standardize equipment nomenclature; FECO introduced national control measures on ODS and HFC refrigerants; promoted energy-efficient, environmentally friendly alternatives at industry meetings, which led to increased adoption of ammonia-based systems; and began prioritizing key areas for standards development in the cold chain sector and exploring partnerships with industry stakeholders; the updating and maintenance of the filing management system and promotion of refrigerant recycling and reuse continued during the reporting period;
- (c) A revision of the Circular on the Management of HCFCs production, sales, and consumption was initiated, which aims to strengthen controls in specific sectors, and is expected to be completed by year-end; the study on revised ODS regulations and the national phase-out plan was completed, and in April 2025, the State Council approved the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025–2030), outlining full HCFC phase-out by 2030 and a 10 per cent HFC

¹ 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.

² As per the letter of 12 September 2025 the Ministry of Ecology and the Environment of China to UNEP.

³ 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 (decisions 86/34 and 86/37).

⁴ Policy studies, revision of standards and codes, technician training and certification, and awareness and outreach activities included in the refrigeration servicing sector plan 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.

reduction by 2029; the Ministry of Ecology and Environment (MEE) convened a meeting of the National Leading Group for Ozone Layer Protection and over a dozen national authorities to introduce the national plan from 2025 to 2030 and review progress;

- (d) Work continued on the development of technical standards in the ICR servicing sector; it was reported at the 95th meeting of the Executive Committee that bidding was underway for two technical standards,⁵ and terms of reference (TOR) were developed for three more;⁶ however, considering the priority tasks outlined in the newly released National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025–2030) and limited funding, the standards development plan was adjusted: the standards for water chillers and multi-split air conditioners will be developed by industry associations without HPMP support and funds will instead support a study and standards development for refrigerant reclamation traceability, for which a contract was signed in July 2025, and a study on leakage prevention standards, for which a contract is expected to be signed by November 2025; codes developed under earlier tranches were translated into English and technical workshops on the codes were held for 400 technicians; final drafts of two standards for the transportation, installation, and servicing of room air conditioners using flammable refrigerants were submitted to the standards committee for approval in September 2024;
- (e) A coordination meeting for HPMP implementation was held in September 2025; FECO/MEE compiled a handbook of the latest regulations to be distributed during training sessions for local officials and technical personnel and drafted management measures for ODS to provide guidance for enterprises on quota application, registration, and filing procedures; two national workshops on ODS phase-out management were held with 300 participants from local Ecology and Environment Bureaus (EEB) and/or law enforcement officers from 31 provinces focusing on regulatory updates, compliance trends, and enforcement practices; technical and policy assistance for daily ODS phase-out management continued, including two thematic training sessions organized for 157 law enforcement officers from local EEBs, covering revised regulations, compliance status, enforcement methods, field monitoring technologies, and disposal practices; the capacity building programme in six selected EEBs continued with the six participating EEBs developing work plans, which included conducting enterprise surveys from ODS producers and distributors, refrigeration and foam enterprises and servicing workshops, and promoting the filing management system;
- (f) A coordination meeting between the General Administration of Customs (GAC), Ministry of Commerce (MOC), and MEE was held to enhance the licensing and quota system; two workshops on ODS import and export (I/E) control were held, one for 218 representatives from I/E enterprises and the other for 85 participants from commerce departments; the revision of the training manual for customs and law enforcement officials is progressing and expected to be completed by year-end; I/E officers participated in two customs border dialogues; a total of 1,138 export permits were issued, and nine export batches of ODS were rejected via the iPIC⁷ mechanism, preventing 209 metric tonnes (mt) of potentially illegal trade and one ODS import permit was issued for returned goods;

⁵ The technical specification for servicing and maintenance of water chillers (heat pumps) and the technical specification for servicing and maintenance of cold storage refrigeration system

⁶ The technical specification for servicing and maintenance of multi-split air conditioner, technical specification for servicing and maintenance of refrigeration and air-conditioning for ICR and similar applications and safety technical requirements for the maintenance of equipment with flammable refrigerants.

⁷ Informal Prior Informed Consent

- (g) The project to establish the Ningbo Customs Anti-smuggling Bureau as a law enforcement cooperation centre (the Centre) for combating illegal ODS trade was completed; with technical support from FECO/MEE, the Centre analyzed ODS smuggling trends, submitted quarterly and annual reports, led investigations, and supported enterprise assessments; the work plan for a study to strengthen the capacity for investigating and processing illegal ODS trade cases was completed, with a contract expected to be signed by year-end; the project to enhance customs capacity to combat illegal ODS trade was completed with eight anti-smuggling bureaus, which conducted field surveys, data collection, policy studies, and inspections of enterprises handling controlled substances, organized online and in-person training workshops for customs officers, outreach activities, and delivered a final report on project outputs;
- (h) Based on an analysis of the regional distribution of refrigeration and air-conditioning servicing enterprises in China, six provinces (Hubei, Guangxi, Hainan, Guizhou, Yunnan, and Shaanxi) signed contracts for the third batch of the pilot cities programme and each began developing project implementation plans focused on strengthening the filing and data management system; conducting surveys in the servicing sector and inventories of enterprises; promoting good practices through training, outreach, and demonstrations of refrigerant management, recycling, and reuse;
- (i) Under a programme organized by the China Association of Refrigeration (CAR), 298 technicians and trainers were trained in provinces previously lacking training centres, in collaboration with local vocational schools; a workshop for women was also held, with 31 participants; an additional 300 planned to be trained under the seventh tranche in 2026, a study tour to Belgium and the Netherlands was organized in December 2024 involving five representatives from MEE and FECO, which focused on F-gas regulations, the promotion of low/zero-GWP refrigerants, recovery and reclamation, and technician training programmes;
- (j) Through the manufacturers' commercial refrigeration after-sales programme, the fourth tranche training target was met by May 2025, with a total of 469 individuals (including 22 women) from 255 small-and-medium-sized enterprises (SMEs) completing the programme, and 402 passing the exam covering ODS policies, equipment installation and servicing, alternative technologies, and refrigerant recovery; the China Refrigeration and Air-conditioning Industry Association (CRAA) continues to organize training and expects to meet the fifth tranche target in early 2026; as for the training through the manufacturers' after-sales programme for R-290 refrigeration and air-conditioning servicing, based on the results from the pilot training, a contract was signed between the Government of Germany and the China Household Electrical Appliances Association (CHEAA) to train another 300 technicians by the end of 2025 and 900 technicians in 2026;
- (k) The China Chain Store and Franchise Association (CCFA) developed and released, on 13 May 2025, the Guidelines for Refrigerant Management in Retail Refrigeration Equipment and Systems, which were promoted through an awareness raising workshop in the supermarket sector with training provided to 61 participants from supermarkets and retail enterprises;
- (l) Promotional activities included a technical seminar with the household appliance industry, updates on association websites, translated publications on ozone protection, promotional videos, media and social media coverage, industry news articles, posters on ozone policies, and updates on the OzonAction in China website; the annual Ozone2Climate industry roundtable and the Ozone2Climate roadshow were held; World Ozone Day was celebrated

with a campus event featuring guest lectures, interactive experiences, and art activities, and received local media coverage with over 600,000 views; and

- (m) Of the US \$255,000 approved for project management and monitoring US \$55,250 was disbursed for staff (US \$43,863), travel (US \$4,972), and meetings and consultations (US \$6,415).

Level of fund disbursement

172. As of 31 August 2025, of the US \$16,329,132 approved so far, US \$10,881,435 (66.64 per cent) had been disbursed by FECO to beneficiaries, as shown in table 1. The balance of US \$5,447,697, including US \$2,386,493 from the seventh tranche will be disbursed in conjunction with the eighth tranche implementation.

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

Description		Tr. 1	Tr. 2	Tr. 3	Tr. 4	Tr. 5	Tr. 6	Tr. 7	Total
Funds approved	UNEP	3,299,132	2,570,000	1,000,000	1,160,000	1,780,000	2,000,000	3,000,000	14,809,132
	Japan	80,000	80,000	0	240,000	0	0	0	400,000
	Germany	300,000	0	0	600,000	220,000	0	0	1,120,000
	Total	3,679,132	2,650,000	1,000,000	2,000,000	2,000,000	2,000,000	3,000,000	16,329,132
Disb. from IAs to FECO	UNEP	3,378,438	2,640,000	950,000	1,350,000	1,100,000	1,030,000	650,000	11,098,438
	Japan								
	Germany	300,000	0	0	350,000	0	0	0	650,000
	Total	3,678,438	**2,640,000	950,000	1,700,000	1,100,000	1,030,000	650,000	11,748,438
	Ratio (%)	99.98	99.62	95.00	85.00	55.00	51.50	21.67	71.95
Disb. from FECO to benefic.*	Total	3,678,438	2,650,000	989,840	1,393,489	1,021,515	534,660	613,507	10,881,449
	Ratio (%)	99.98	100.00	98.98	69.67	51.08	26.73	20.45	66.64
Fund balance		694	0	10,160	606,511	978,485	1,465,340	2,386,493	5,447,683

* The disbursement includes both from FECO to beneficiaries and from UNEP for direct implementation.

** Activities under the PCA have been completed and FECO has submitted final progress and expenditure reports. UNEP is working on processing the final payment of US \$10,000 to FECO.

173. In line with decision 95/43(b), UNEP confirmed that it has applied the overarching principles for managing funds transferred from implementing agencies to FECO for stage II of the servicing sector plan. UNEP has closely monitored the level of funds disbursed to FECO and from FECO to beneficiaries, and has disbursed funds to FECO in installments, aligned with a six-month reporting cycle. Disbursements are guided by cash flow projections through an activity-based budgeting approach to ensure that disbursements are directly linked to specific, time-bound activities that reflect the financial requirements necessary to fulfill obligations and maintain sufficient liquidity for effective project implementation. To mitigate foreign exchange exposure, UNEP reports expenditures using the spot exchange rate at the time of each transfer to FECO. FECO must disclose subcontracting criteria at the time of signing the PCA. All subcontracted activities are explicitly outlined in the PCA to ensure transparency and accountability. As shown in table 1 above, the current balance of funds kept by FECO is US \$866,989, which represents 7.4 per cent of the from the total funding that has been transferred by UNEP to FECO. UNEP will continue monitoring closely the disbursements by FECO to beneficiary enterprises before releasing additional funds.

Implementation plan for the eighth tranche of stage II of the servicing sector plan

174. The following activities will be implemented between January 2026 and December 2027:

- (a) Enhanced inter-agency policy research and coordination in preparation for the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025–2030), including assessments of distributors and end users to ensure accurate consumption data; a feasibility study on developing specialized tools for registering micro-enterprises; continued surveys in cold chain subsectors; ongoing policy research to strengthen ODS management in the servicing sector, including maintenance practices and local enforcement measures (UNEP) (US \$250,000 and funds from previous tranches); continued support for the ODS Management Information System (MIS), an online platform designed for enterprises to register and submit data and promotion of refrigerant recycling and reuse; ongoing development of three codes and standards from previous tranches,⁸ and initiation of the studies on standards for refrigerant reclamation traceability and leakage prevention (UNEP) (funds from previous tranches);
- (b) Annual coordination meeting on the HPMP; continued studies to support national policy and law enforcement on ODS management (UNEP) (US \$38,000 and funds from previous tranches); training on ODS enforcement at provincial and municipal levels for at least 80 staff from local EEBs and/or law enforcement officers; continued technical and policy assistance for daily ODS phase-out management and support for training workshops held by local EEBs for environmental protection personnel (UNEP) (US \$60,000 and funds from previous tranches); overseas study tour and/or NOU participation in international workshops and meetings (UNEP) (US \$50,000 and funds from previous tranches); continued support for six selected EEBs and selection of two new EEBs for capacity building in policy development, filing management system implementation, monitoring, enforcement, public awareness, and training (UNEP) (US \$50,000 and funds from previous tranches);
- (c) Continued support for routine management of ODS I/E and the licensing and quota system; formulation of implementation rules for the newly revised Measures for the Administration of the Import and Export of Ozone-Depleting Substances; continuation of the study on laws and penalties for illegal trade, including case studies, and the study on national trade policies (UNEP) (funds from previous tranches); two workshops to train a total of 150 staff from Customs supervision and anti-smuggling departments, two workshops for enterprises with 200 participants in total, and one workshops for 200 staff from commerce departments, covering, among other matters, Montreal Protocol progress, related control requirements, import and export policies, national laws and regulations, and efforts in combating illegal trade in ODS (UNEP) (US \$150,000 and funds from previous tranche); continued operation, updates, and maintenance of the ODS I/E paperless management approval system (UNEP) (US \$150,000 and funds from previous tranche);
- (d) The six pilot cities selected for a third batch of capacity-building activities will conduct planned activities and submit progress reports, including data collection, strengthening of local the filing management systems; promoting good practices through training and outreach; and demonstration of refrigerant management, recycling, and reuse (UNEP) (US \$40,000 and funds from previous tranche);
- (e) Training of 1,050 technicians and trainers through CAR, in partnership with the vocational system, on good servicing practices for alternative refrigerants, including at least one training workshop for technicians from international/regional countries to promote South-South cooperation; one international training and four domestic trainings for

⁸ Technical standards for the servicing and maintenance of cold storage systems, refrigeration and air-conditioning equipment for industrial and commercial applications, and for equipment with flammable refrigerants.

120 technicians; one overseas study tour to a country with experience in ODS recovery; strengthened coordination with national associations, industry experts, and experienced staff to deliver enhanced technical support and assistance for locally organized training programmes and workshops (UNEP) (US \$100,000 and funds from the previous tranche);

- (f) Continuation of the manufacturers' commercial refrigeration after-sales programme at selected enterprises by CRAA, through training of a total of 780 technicians on the use of alternative technologies in commercial refrigeration, including two trainings for women (UNEP) (funds from previous tranches); continuation of the programme by manufacturers of room air conditioners, led by CHEAA, to train 1,000 after-sales technicians on R-290-based equipment (Government of Germany) (funds from previous tranches);
- (g) Continued training of 140 technicians in the supermarket subsector on good practices and alternative technologies, along with the ongoing updating of training materials and the promotion of alternative technologies at relevant industry meetings (Government of Germany) (funds from previous tranches);
- (h) Awareness-raising activities including celebration of the World Ozone Day; design, production, and dissemination of outreach materials; maintenance and updates of the OzonAction in China website (UNEP) (US \$160,000 and funds from previous tranches); and organization of the Ozone2Climate roadshow and roundtable events and an online exhibition for Ozone2Climate technology (UNEP) (US \$50,000 and funds from previous tranches); and
- (i) Project management and monitoring for UNEP (US \$102,000), comprising the cost of staff (US \$80,000), travel (US \$10,000), and meetings and consultations (US \$12,000).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Report on HCFC consumption

175. In 2024, consumption of HCFCs in the servicing sector was 52,380.82 mt, or 2,898.29 ODP tonnes, as shown in table 2.⁹

Table 2. HCFC consumption in the refrigeration servicing sector (2020-2024 country programme data)

HCFC	2020	2021	2022	2023	2024	Average*
mt						
HCFC-22	53,450.32	51,720.55	53,065.05	50,637.00	50,310.83	64,466.58
HCFC-123	358.18	406.30	411.69	318.03	77.83	113.75
HCFC-124	(23.20)	(31.65)	21.73	(17.49)	(3.38)	139.56
HCFC-142b	584.36	2,011.60	884.31	1,287.51	1,995.54	5,338.58
Total (mt)	54,369.66	54,106.80	54,382.78	52,225.05	52,380.82	70,058.47
ODP tonnes						
HCFC-22	2,939.77	2,844.63	2,918.58	2,785.04	2,767.10	3,545.68
HCFC-123	7.16	8.13	8.23	6.36	1.56	2.30
HCFC-124	(0.51)	(0.70)	0.48	(0.38)	(0.07)	3.05
HCFC-142b	37.98	130.75	57.48	83.69	129.71	347.03
Total (ODP tonnes)	2,984.40	2,982.81	2,984.77	2,874.70	2,898.29	3,898.06

* Average consumption in 2009 and 2010.

⁹ 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.

176. 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 the refrigeration servicing sector of stage II of the HPMP, while supporting the concomitant phase-out in the RAC and ICR manufacturing sectors. The 2024 HCFC consumption in the servicing sector is about 26 per cent less, in ODP tonnes, than the average consumption in 2009 and 2010 but showing a slight increase of around 1 per cent compared to the consumption in 2023. Since 2022, there has been a large reduction in HCFC-123 and HCFC-124, and the consumption of HCFC-22 decreased by 5 per cent; however, the consumption of HCFC-142b in the servicing sector increased by 126 per cent over the same period.

177. UNEP clarified that, based on the quota for manufacturing, the estimated manufacturing consumption in new ICR applications based on HCFC-142b, which includes bridge crane air conditioners, is around 55 to 65 mt annually and is decreasing while older applications require more frequent servicing and recharging compared to newly installed ones. Over the past decade, the HCFC-22 servicing demand was affected by the rapid growth in refrigeration equipment in China and the servicing needs of existing equipment, which led to some fluctuations in consumption in recent years. Nevertheless, overall consumption remains within controlled limits.

178. Under the newly approved National Implementation Plan for the Montreal Protocol (2025–2030), manufacturing of certain HCFC-based air-conditioning and refrigeration applications will be prohibited step by step, starting from 2027. Accordingly, the servicing needs of HCFC-22 and HCFC-142b are expected to decrease in the next few years. This is in addition to the ongoing implementation of a registration/filing system for refrigeration servicing enterprises in the servicing sector, which will enforce stricter management of refrigerant usage.

Progress report on the implementation of the seventh tranche of stage II of the servicing sector plan and activities proposed for the eighth tranche

179. Noting the detailed progress report and the level and diversity of activities, the Secretariat requested additional overarching analysis of what was achieved in the last reporting period of 2024–2025 vis-à-vis the planned related activities under the eighth tranche in relation to three overarching areas: (a) implementation of the technician certification scheme, (b) development of standards and codes, and (c) supporting policy actions.

180. Regarding the technician certification scheme, during the 2024–2025 reporting period, China released the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025–2030), which underlined the need to strengthen the certification of refrigeration servicing technicians, enhance the certification system for the handling of refrigerants, and encourage the organization of skills competitions for servicing technicians, to improve good practices in refrigeration servicing. The new tranche, in line with the National Implementation Plan's commitment to strengthen the refrigeration vocational competency certification, will support research projects on certification policies. A study on certification methods for specific subsectors is planned to support the implementation of the certification policies. In line with MEE's internal procedures, the detailed work plan of the policy studies will be approved by MEE after the approval of the tranche.

181. As for the development of standards and codes, given that refrigerant recovery will be critically important over the next five years, two standards were prioritized, with work initiated under the seventh tranche. These are the technical standards and study on traceability management for refrigerant reclamation in refrigeration systems, and the study on technical standards for leakage prevention of refrigerants in the process of recovery and reuse. Although the new tranche does not include a budget for the development of both standards, the work will continue on the two standards in synergy with the policy research component

to promote the recovery and recycling of refrigerants in China. This is in addition to the several codes¹⁰ that were developed or updated by UNEP and the Government of Germany in 2022 and 2024.

182. Regarding the supporting policy actions, during the reporting period, the third batch of beneficiaries in the pilot cities project began implementation of the local capacity-building initiatives, providing direct assistance to provincial-level management capacity, building and supporting the enhancement of local technical capabilities, thereby effectively facilitating the management of ODS and policy actions and enhancing the understanding of consumption sectors at the local level. FECO/MEE also continued to conduct surveys in the subsectors of the cold chain sector including among cold storage and commercial refrigeration end users in the seventh tranche, based on the results of the initial cold chain sector survey and study previously conducted under the fourth tranche, to better understand the existing situation of the servicing companies and technicians in the cold chain industry. The online platform for data submission, MIS, is also being continuously improved to meet filing management needs. Since its launch in 2023, the MIS has undergone two upgrades: one to optimize the system's functionality to facilitate easier data entry for enterprises, and another to ensure the accuracy of reported data, with regular assistance provided to enterprises in completing their submissions. The new tranche will continue to support policy research, covering the entire refrigeration industry. Surveys within the refrigeration sector will also involve the use of foam materials, such as insulation foam materials in cold storage and waste household refrigeration equipment. Policy studies conducted under local capacity-building initiatives will also encompass all consumption sectors.

183. Due to the size of the country and the scale of the number of enterprises involved in the servicing sector, the local-level enforcement of policy actions is crucial for compliance. Therefore, under the ongoing approved tranches and the requested eighth tranche, FECO/MEE will continue to engage with local-level authorities to enhance their capacity to strengthen policy enforcement at all levels. The proposed capacity building activities under the Enabling component will target local authorities and enforcement officers from all 31 provinces.

184. On the level of disbursement, UNEP explained that the time needed for the preparation and signing of PCAs for each tranche left only a few months for the disbursement of funds in the same year. Furthermore, subcontracts signed under each tranche usually have a two- or three-year implementation period, and FECO/MEE issues the interim disbursement or final payment to local partners only after accepting their work.

185. UNEP confirmed that there was no overlap in the awareness and outreach activities being implemented under the refrigeration servicing sector plan with that under other projects in China.

Project implementation and monitoring

186. 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.

¹⁰¹⁰ UNEP supported the development of three codes, i.e., “Specific codes for the servicing and maintenance of air-conditioning units (heat pumps) with focus on the refrigerant emissions”, “Specific code of the refrigeration equipment operational requirements for refrigeration management”, and “Technical codes on requirements for training tools/equipment and space for conducting hand-on session of good practices training of refrigeration servicing technicians” and the Government of Germany supported the revision and update of two codes i.e. “Particular requirements for transportation of room air-conditioner employed the flammable refrigerants (QB/T 4976-2016)” and “Technical requirements for installation, servicing and transportation of room air conditioner employed flammable refrigerants (QB/T 4835-2015)”.

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	681,678
	Domestic travel	71,430
	International travel	5,853
	Domestic meeting	53,695
	International meetings	0
	Consulting service	43,354
Subtotal for sector-specific costs		856,010
Operations costs	Shared costs (support staff, computers, Internet, printing, office operations and maintenance)	846,723
Total disbursements (2017-2024)		1,702,733

Gender policy implementation

187. In line with the Multilateral Fund's gender policy (decisions 84/92, 90/48(c), and 92/40(b)), one technician training session was held for women during the implementation of the seventh tranche, with a total of 31 participants. Additionally, 22 women participated in training delivered through the manufacturers' commercial refrigeration after-sales programme. Relevant data was collected, and the participation of women was considered throughout the implementation of all project components. During the eighth tranche, women will be encouraged to serve as instructors/trainers and participate in workshops. FECO/MEE will continue collecting relevant data for all implemented activities, including the number of women participating in meetings, trainings, workshops, capacity-building, and outreach activities. Outreach and training materials will be developed to further promote women's participation.

Sustainability of the HCFC phase-out and assessment of risks

188. In China, one of the primary goals of training activities in the servicing sector is to improve and enhance the infrastructure for the safe use of the new generation of refrigerants, including flammable and toxic refrigerants which are entering the market. Over the past few years, with ongoing efforts based on the enforcement of ODS regulations and a series of technical assistance activities, including the revision of standards, training, pilot projects, and outreach in the servicing sector, local partners have developed a clear understanding of the trend towards lower-GWP alternatives. The industry recognizes the timeline for the HCFC phase-out and is progressing toward it by preparing for the adoption of lower-GWP refrigerants from multiple angles. China has set out a strong commitment in the National Implementation Plan for the Montreal Protocol on Substances that Deplete the Ozone Layer (2025–2030) outlining the plan for full HCFC phase-out by 2030 and a 10 per cent HFC reduction by 2029 and continues to address the emerging challenges in adopting these new alternatives in multiple sectors through implementing of activities that will strongly support the adoption of flammable and other lower-GWP alternatives.

189. As the manufacturing of certain HCFC-based refrigeration and air-conditioning applications will be prohibited step by step, starting from 2027, the servicing needs for HCFCs are expected to decrease in the next few years. China, in cooperation with UNEP, will continue to strengthen research collaboration with industry associations to gain a better understanding of specific consumption volumes of HCFCs in the servicing sector, while the ongoing implementation of the filing management system for refrigeration servicing enterprises will enforce stricter management of refrigerant usage.

Conclusion

190. 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. Progress has been made in the activities for the sector and its enabling component, and the overall disbursement rate is at 67 per cent

(and 20 per cent for the seventh tranche). Consumption of 2,898.29 ODP tonnes of HCFCs in the refrigeration servicing sector in 2024 confirms that the Government has maintained its commitment to reduce HCFC consumption for the refrigeration servicing sector by 836 ODP tonnes in 2024 (i.e., from the 2015 consumption of 3,734 ODP tonnes) surpassing the 2020 target consumption for the refrigeration servicing sector of 3,000 ODP tonnes. The reduction that has been achieved so far will be sustained through the enforcement of the quota management system for HCFC production and consumption, the training programmes and technical assistance activities in the refrigeration servicing sector under implementation.

RECOMMENDATION

191. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the seventh 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 eighth 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 2026-2027 tranche implementation plan, in the amount of US \$1,200,000, plus agency support costs of US \$131,680 for UNEP.

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 (RAC) sector plan to reduce HCFC consumption in the sector by 45 per cent by 2020;
- (c) The polyurethane (PU) rigid 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 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.¹ The submission 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 address any illegal trade in those substances; and
 - (ii) A progress report regarding actions taken with a view to strengthening of legislation on ozone-depleting substances (ODSs) and implementation thereof in China; and

¹ 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.

- (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 submitted, on behalf of the Government of China, the report on the current monitoring, reporting, verification and enforcement systems and the progress report regarding actions taken with a view to strengthening of legislation on ODSs.² 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).

² UNEP/OzL.Pro/ExCom/83/11/Add.1

Annex II

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

Stage II: Cumulative PMU expenditure as of 31 December 2024 (US \$)

Item	Sectors *						
	Production	RAC	PU foam	XPS foam	ICR	Solvent	Servicing
Sector costs	14,414,242						
Project staff	2,838,085	2,186,803	1,845,548	1,703,142	2,298,496	730,930	681,678
Domestic travel	176,556	104,619	100,623	148,990	181,119	77,794	71,430
International travel	29,412	12,454	7,205	13,747	17,723	6,756	5,853
Domestic meeting **	133,596	86,467	76,136	108,603	134,785	58,498	53,695
International meetings	0	0	0	0	0	0	0
Consulting service ***	105,575	61,741	63,681	92,023	110,815	46,310	43,354
Subtotal sector costs	3,283,224	2,452,084	2,093,193	2,066,505	2,742,938	920,288	856,010
Share costs	10,304,743						
Supporting staff ****	6,754,897						
Computer, Internet, phone, printing, etc.	1,065,769						
Office operation and maintenance, utilities	2,484,077						
Total	5,418,862	3,801,181	3,327,407	3,778,248	4,863,861	1,826,693	1,702,733

Note: Total cumulative expenditure of PMU from 2017-2024 for the implementation of HPMP/HPPMP stage II is US\$24,718,985. From the total expenditure of US\$24,718,985, US\$13,320,313 came from the received PMU of the sector plans of HPMP/HPPMP Stage II, while the expenditure of remaining US\$11,398,672 were temporarily covered by FECO's own budget and expected to be partially reimbursed from PMU of future tranches to be received from Implementing Agencies. The expenditure supported by the IS and co-finance of 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.

Annex III

**DATA USED IN THE APPROACH TO ESTIMATE THE POSSIBLE TONNAGE OF HFCs
PHASED IN BY MULTILATERAL FUND-ASSISTED ENTERPRISES TO MEET THE
DEMAND ASSOCIATED WITH THE HCFC-BASED MANUFACTURING CAPACITY
CONVERTED TO R-290 UNDER THE HPMP RAC SECTOR PLAN (DECISION 94/34(c))**

Particular	Year		
	2020	2021	2022
Converted R-290 manufacturing capacity (units/year)	10,375,472	11,796,305	11,796,305
R-290 split RAC units manufactured (units)	21,046	50,241	130,239
R-290 portable units manufactured (units)	1,918,024	1,954,138	1,103,835
Remaining capacity, high (factory-sealed not fungible) (units/year)	10,354,426	11,746,064	11,666,066
Remaining capacity, low (factory-sealed fungible) (units/year)	8,436,402	9,791,926	10,562,231
Normalized proportion of R-410A (%)	25	23	22
Normalized proportion of HFC-32 (%)	75	77	78
Industry-wide capacity utilization (%)	58.8	63.8	62.1
R-410A high (mt)	1,217.26	1,373.25	1,295.90
R-410A low (mt)	991.78	1,144.79	1,173.28
HFC-32 high (mt)	3,646.51	4,617.88	4,493.65
HFC-32 low (mt)	2,971.04	3,849.62	4,068.46
HFC high (CO ₂ -eq tonnes)	5,002,431	5,983,716	5,738,402
HFC low (CO ₂ -eq tonnes)	4,075,795	4,988,233	5,195,438