



**United Nations
Environment
Programme**

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/88/43
7 November 2021

ORIGINAL: ENGLISH



EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Eighty-eighth Meeting
Montreal, 15-19 November 2021¹

PROJECT PROPOSALS: CHINA

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

Phase-out

- HCFC phase-out management plan (stage I) – progress report on the room air-conditioning sector plan UNIDO
- HCFC phase-out management plan (stage II): UNDP, UNEP, UNIDO, World Bank, Austria, Germany, Italy and Japan
 - Extruded polystyrene foam sector plan – fourth tranche UNIDO and Germany
 - Polyurethane rigid foam sector plan – third tranche World Bank
 - Industrial and commercial refrigeration and air-conditioning sector plan – fourth tranche UNDP
 - Room air-conditioning manufacturing and heat pump water heaters sector plan – third tranche UNIDO, Austria and Italy
 - Solvent sector plan – fourth tranche UNDP
 - Refrigeration and air-conditioning servicing sector plan and the national enabling programme – fourth tranche UNEP, Germany and Japan

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

HCFC phase-out management plan (stage I) - Progress report on the room air-conditioning sector plan (UNIDO)

1. On behalf of the Government of China, UNIDO submitted a progress report on the implementation of the room air-conditioning (RAC) sector plan under stage I of the HCFC phase-out management plan (HPMP), in line with decision 86/33(d).

2. All 26 RAC lines and three compressor lines based on HCFC-22 obtained national acceptance and had been fully converted to R-290 (18 RAC lines), R-410A (eight RAC lines) and R-290 (three compressor lines). Of the 10,813.7 mt of HCFC-22 phased out through the conversion of those lines, 325.6 mt were associated with enterprises with non-Article-5 ownership whose conversion was funded from sources outside the Multilateral Fund, and 240.0 mt were phased out through the demonstration project at Midea approved at the 61st meeting.

3. As of August 2021, a total of 260,711 R-290 split units and 4,600,000 factory-sealed R-290 units (i.e., dehumidifiers and portable air conditioners) had been manufactured and installed.² In line with decision 84/68(d)(ii), UNIDO provided information on the effect of the incremental operating cost (IOC) incentive scheme on the market uptake of R-290 split air-conditioning (AC) units: all 260,711 R-290 split units were sold locally; two-thirds of the sales were for inverter units;³ and 80 per cent of the sales (including inverter and fixed-speed units) were for grade 2 energy efficiency units, as shown in Table 1. A total of US \$4,355,932 has been disbursed under stage I for the project implementation and monitoring unit (PMU) to cover personnel costs, travel, meetings, and costs shared across the sectors to operate the PMU.

Table 1. Percentage of R-290 RAC split units by energy class sold by August 2021

	Split units	Inverter (%)	Fixed-speed (%)
Local sales	Grade 1 energy efficiency	0	19
	Grade 2 energy efficiency	67	13
	Grade 3 energy efficiency	0	1
Export to Article 5 and non-Article 5 countries		0	0

Level of fund disbursement

4. As of August 2021, of the US \$75,000,000 approved, US \$68,314,000 (91 per cent) had been disbursed by UNIDO and US \$68,533,960 (91 per cent) had been disbursed by the Foreign Economic Cooperation Office (FECO)⁴ to the beneficiaries, as shown in Table 2.

Table 2. Disbursement (US \$) by tranche in the RAC sector

Description	Tranche 1	Tranche 2	Tranche 3	Tranche 4	Tranche 5	Total
Funding*	36,430,000	9,200,000	8,495,000	9,625,000	11,250,000	75,000,000
Disbursed by UNIDO	36,430,000	9,200,000	8,434,000	8,662,500	5,587,500	68,314,000
Disbursed by FECO	36,430,000	8,210,958	8,069,073	9,625,000	6,198,929	**68,533,960

* Excluding agency support costs.

** Higher disbursement than that of UNIDO given disbursements by FECO with its own resources for IOC payments in 2020.

² 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 the sale of factory-sealed units, such as portable air conditioners, window-type AC, and dehumidifiers, which are already established in the marketplace.

³ The sales from one enterprise were mistakenly categorized as fixed-speed units at the 86th meeting. Those sales have since been verified as inverter-based equipment.

⁴ The disbursement by FECO is higher than that of UNIDO given disbursements by FECO with its own resources for IOC payments in 2020; FECO plans to request further disbursement from UNIDO.

Remaining activities in the RAC sector plan

5. All conversion projects and technical assistance (TA) activities⁵ have been completed. Due to the COVID-19 pandemic, which affected the manufacturing and marketing of R-290 RAC equipment and delayed independent verification of sales, the Government of China was granted an extension of the date of completion of stage I to 31 December 2021 to allow for the increasing sales of R-290 RAC equipment and payment of the associated IOCs to beneficiary enterprises (decision 86/33(c)).

Revision to the IOC incentive scheme

6. At its 84th meeting, the Executive Committee agreed to the IOC incentive scheme proposed by the Government of China, designed to encourage sales of R-290 split units by providing higher IOC for the units that were sold earlier and that had higher energy efficiency. Due to the constraints imposed by the pandemic, at its 86th meeting, the Executive Committee agreed to further modify the IOC incentive scheme as proposed by the Government of China, as shown in Table 3.

Table 3. IOC incentive scheme agreed at the 86th meeting (RMB*/unit)

Split units		Until 31 August 2021		After 1 September 2021	
		Inverter	Fixed-speed	Inverter	Fixed-speed
Local sales	Grade 1 energy efficiency	150	125	75	62.50
	Grade 2 energy efficiency	90	75	45	37.50
	Grade 3 energy efficiency	50	38	25	18.75
Export to Article 5 countries		90	75	45	37.50
Export to non-Article 5 countries		0	0	0	0.00

* RMB = Renminbi

7. However, a new energy efficiency standard that uses an annual performance factor (APF) as an indicator of energy efficiency was introduced in June 2020 and came into effect in July 2021. While the new standard does not explicitly depend on whether equipment uses a variable- or fixed-speed compressor, equipment with fixed-speed compressor could only meet the lower two categories (i.e., $3.30 \leq \text{APF} < 4.00$). Equipment with variable-speed compressor that met the grade 2 energy efficiency standard under the old standard would likely have an APF between 4.00 and 4.50. The implementation of the new standard halted the manufacture and sales of R-290 RAC units as manufacturers had to develop new product models to meet the new standard's requirements. Accordingly, the Government of China proposed revising the IOC incentive scheme as shown in Table 4 in order to address the increased costs of manufacturing R-290 RAC units that met the new standard.

Table 4. Revised IOC incentive scheme (RMB/unit)

Split units		IOC (RMB/unit)
Local sales	$5.00 \leq \text{APF}$	450
	$4.50 \leq \text{APF} < 5.00$	400
	$4.00 \leq \text{APF} < 4.50$	360
	$3.50 \leq \text{APF} < 4.00$	100
	$3.30 \leq \text{APF} < 3.50$	50
Export to Article 5 countries		120
Kits to Article 5 countries		80
Export to non-Article 5 countries		0

8. The revised IOC incentive scheme would: be applied from July 2021 until the completion of stage I in December 2021, and for stage II of the HPMP; continue to use the first-come, first-served principle; not limit the amount of IOC for any individual manufacturer; and continue to be provided only on the sale of

⁵ Additional TA activities to facilitate the introduction of R-290 RAC technology would be conducted under stage II of the sector plan.

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

Secretariat's comments

HCFC consumption

9. The consumption of HCFC-22 in the RAC sector in 2020 was 29,000 mt (1,595 ODP tonnes), which is lower than the maximum allowable consumption stated in the Agreement between the Government of China and the Executive Committee (Table 5). The 2021 quota for the sector has been issued at 31,762 mt (1,747 ODP tonnes).

Table 5. HCFC-22 consumption and targets for the RAC sector

RAC sector plan		2016	2017	2018	2019	2020
Consumption	mt	55,000.0	55,000.0	52,000.0	50,000.0	29,000.0
	ODP tonnes	3,025.0	3,025.0	2,860.0	2,750.0	1,595.0
Maximum allowable consumption	mt	67,231.0	67,231.0	52,291.0	52,291.0	41,085.0
	ODP tonnes	3,697.7	3,697.7	2,876.0	2,876.0	2,259.7

Market uptake of R-290 RAC split units

10. At the 86th meeting, the Secretariat reported that, notwithstanding best efforts by the Government of China, UNIDO, China Household Electric Appliances Association (CHEAA), industry and other stakeholders, and the implementation of the IOC incentive mechanism, market uptake of R-290 RAC equipment has been limited.⁶ Since the 86th meeting, the market uptake of R-290 split RAC units remains limited. Preliminary information indicates that the market share of R-410A has decreased while that of HFC-32 has continued to increase, and may now be comparable to that of R-410A. The new energy efficiency standard does not inhibit this development, as HFC-32-based equipment can meet the standard in part by increasing the refrigerant charge (which is not the case for R-290-based RAC units); moreover, as HFC-32 is a component of R-410A, RAC manufacturers have experience using that refrigerant, and relatively minor changes in components are required when transitioning from R-410A to HFC-32; finally, HFC-32-based equipment tends to be more efficient and less costly than R-410A-based equipment.

11. Chinese RAC manufacturers were nonetheless committed to the conversion to R-290. While detailed information on conversions at RAC manufacturing lines not assisted by the Multilateral Fund was not available, UNIDO reported that two RAC manufacturers were planning to convert a manufacturing line to R-290 using their own resources, and confirmed that the manufacturing lines that were converted to R-290 under the HPMP were not manufacturing R-410A-based equipment.

Revised IOC incentive scheme

12. The Secretariat noted that while manufacturers may face additional costs to manufacture R-290 RAC units that meet the new energy efficiency standard, such costs were difficult to quantify. Moreover:

- (a) The IOC incentive under the revised scheme would increase the funding per unit relative to that provided under the HPMP: while enterprises had received 360 RMB/unit for the majority (59 per cent) of grade 2 energy efficiency units sold, approximately a third had received 180 RMB/unit, in line with the progressive reduction in the IOC incentive scheme;

⁶ Paragraphs 125-128 of UNEP/OzL.Pro/ExCom/86/21/Add.1.

- (b) The 31 December 2021 date of completion would limit sales that could be effectuated under the new IOC incentive scheme, particularly as additional time would be needed for manufacturers to design, build, and certify equipment that met the top two APF categories;
- (c) The highest APF category that could be met by equipment presently being manufactured was the third APF category (i.e., $4.00 \leq \text{APF} < 4.50$); and
- (d) The proposed IOC incentive scheme would continue to be applied under stage II, contrary to the model agreed at the 84th meeting of progressive reductions in the IOC incentive scheme to encourage the early manufacturing and sale of R-290 RAC units.

13. On that basis, the Secretariat had detailed discussions with UNIDO on the revised IOC incentive scheme proposed, and agreed on the following:

- (a) Equipment with fixed-speed compressors and with the lowest two APF categories (i.e., APF below 4.00) would not be eligible to receive IOCs;
- (b) IOC for the top two APF categories (i.e., APF above 4.50) was not applicable to stage I as no such equipment could be manufactured by the date of completion of stage I;
- (c) IOC for the third APF category (i.e., $4.00 \leq \text{APF} < 4.50$) would be 240 RMB/unit, on the understanding that the IOCs under stage II would be reduced by 50 per cent of that level annually, as shown in Table 6;
- (d) IOC for stage II of the HPMP would be lower than that used under stage I, and would be reduced by 50 per cent annually; and
- (e) On an exceptional basis, and for stage I only, the level of IOCs indicated in Table 6 would be provided for RAC units manufactured by 31 December 2021 and sold by 31 August 2022; in line with past practice, sales would be verified; and under stage II, the IOC levels specified in Table 6 would be based on sales in that respective year.

Table 6. Agreed IOC incentive scheme (RMB/unit)

Split units		HPMP stage I and II	HPMP stage II	HPMP stage II
		Until 31 December 2021*	1 January 2022 to 31 December 2022	1 January 2023 to 31 December 2023
Local sales	$5.00 \leq \text{APF}$	n/a	320	160
	$4.50 \leq \text{APF} < 5.00$	n/a	220	110
	$4.00 \leq \text{APF} < 4.50$	240	120	60
	$3.50 \leq \text{APF} < 4.00$	0	0	0
	$3.30 \leq \text{APF} < 3.50$	0	0	0
Export to Article 5 countries		120	80	40
Kits to Article 5 countries		80	60	30
Export to non-Article 5 countries		0	0	0

* On an exceptional basis, and for stage I only, the level of IOCs indicated in Table 6 would be provided for RAC units manufactured by 31 December 2021 and sold by 31 August 2022.

14. The agreed IOC incentive scheme will allow stage I to be completed by 31 December 2021 in line with decision 86/33(e), as IOCs would be disbursed based on sales of equipment manufactured prior to the date of completion of the project; in line with the seasonal nature of sales of AC equipment (i.e., late spring and summer); the R-290 units that were manufactured up to the end of 2021 could be sold up to 30 August 2022. Any remaining balances related to IOCs of units manufactured by the end of 2021 but not sold by 30 August 2022 would be reported on the financial completion of the project and returned to the Multilateral Fund.

15. The Secretariat considers that, in line with the new energy efficiency standard, the agreed IOC incentive scheme will encourage the uptake of energy-efficient R-290 RAC units. Nonetheless, the implementation of the IOC incentive scheme by itself is unlikely to fundamentally alter the market dynamics and ensure market uptake of R-290 RAC equipment. The continued implementation of activities 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. Similarly, policies and regulations will likely need to be implemented outside of China as well to foster acceptance of R-290 RAC equipment in those markets.

Conclusion

16. All conversions and TA activities have been completed. The disbursement from FECO to the final beneficiaries is at 91 per cent, and the consumption of HCFC-22 in the sector remains below the targets specified in the Agreement with the Executive Committee. Notwithstanding the 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, which is being manufactured on the lines converted under the HPMP to R-290; R-410A-based equipment is not being manufactured on those lines. The decision by the Government of China not to use the IOC incentive scheme for factory-sealed equipment, but to instead focus on R-290 split units reflects the Government's commitment to ensure the successful uptake of the technology; the planned conversion by two RAC manufacturers to R-290 with their own resources is an encouraging signal of market acceptance. The Secretariat supports the implementation of the agreed IOC scheme until 31 December 2021.

Recommendation

17. The Executive Committee may wish to consider noting:
- (a) The progress report on the implementation of the room air-conditioning (RAC) sector plan of stage I of the HCFC phase-out management plan (HPMP) for China, including the progress on the effect of the incremental operating cost (IOC) incentive scheme on the market uptake of R-290 split air-conditioning units in China, submitted by UNIDO in line with decision 84/68; and
 - (b) The agreed revision to the IOC incentive scheme for the RAC sector plan, as reflected in document UNEP/OzL.Pro/ExCom/88/43.

HCFC PHASE-OUT MANAGEMENT PLAN (STAGE II) (UNDP, UNEP, UNIDO, World Bank, Austria, Germany, Italy and Japan)
Overarching strategy for stage II of the HPMP for China – Note by the Secretariat
Background

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

19. The HCFC consumption limits and targeted phase-out amounts associated with the six sector plans of stage II for the 2016-2026 period are shown in Table 1.

Table 1. HCFC consumption limits and phase-out by sector plans 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 and enabling component	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Phase-out by sector							
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 and enabling component		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.

** 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.

20. At the 80th and 81st meetings, the Executive Committee approved the second tranches for all sector plans except for the PU foam sector plan. At the 82nd and 83rd meetings, on behalf of the Government of China, UNDP, UNEP, UNIDO, the World Bank and the Governments of Germany and Japan submitted requests for the third tranches of the XPS foam (US \$8,000,000), ICR (US \$12,000,000), and solvent (US \$5,549,492) sector plans, and the refrigeration and air-conditioning servicing sector and enabling programme (US \$3,850,000); and for the second tranche of the PU foam (US \$10,600,000) sector plan. The Executive Committee postponed the consideration of these tranches 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.

21. At the 84th meeting, upon consideration of the funding tranche requests of sector plans for stage II of the HPMP that were submitted by relevant bilateral and implementing agencies on behalf of the

Government of China, the Executive Committee decided, *inter alia* (decision 84/69):

- (a) With regard to stage II of the HCFC phase-out management plan (HPMP) for China approved at the 77th meeting:
 - (i) To request the relevant bilateral and implementing agencies, on behalf of the Government of China, to submit, at the 85th meeting, the 2020 funding tranche requests for the PU foam, XPS foam, 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 RAC, ICR, and refrigeration and air-conditioning servicing sectors and enabling programme, and, for the RAC and ICR sector plans, the maximum allowable sectoral consumption levels of HCFC as described in rows 1.3.1 and 1.3.4;
 - (iv) Also to request the Government of China, through the relevant bilateral and implementing agencies, to submit, at the 86th meeting, figures for potential revisions to Appendix 2-A for:
 - a. Row 1.2 specifying the maximum allowable total consumption of HCFCs in 2021-2026 to reflect the information under sub-paragraph (a)(iii) above;
 - b. The XPS foam, PU foam and solvent sector funding tranches for 2021-2026 in rows 2.2.1 to 2.2.4, 2.3.1 to 2.3.2 and 2.6.1 to 2.6.2, respectively; and
 - c. Tonnages associated with lines 4.1.1 to 4.6.3 to reflect the information in sub-paragraphs (a)(iii) above;
 - (v) Further to request the Government of China to update the information on necessary revisions to reflect the present decision for the approved XPS foam, PU foam and solvent sector plans;
 - (vi) To approve US \$1,000,000, plus agency support costs of US \$120,000 for UNEP, for the refrigeration and air-conditioning servicing sector and enabling programme, consistent with the revised Appendix 2-A referred to in sub-paragraph (a)(ii) above; and
 - (vii) To request UNDP as the lead implementing agency of the overall stage II of the HPMP, on behalf of the Government of China, to submit, at the 86th meeting, a draft revised Agreement between the Government of China and the Executive

Committee reflecting only the relevant outcomes approved at the 84th meeting or those relevant to sub-paragraphs (a)(iii) and (a)(iv) above, and the revised plan of action for the RAC, ICR and refrigeration and air-conditioning servicing sectors and enabling programme also due for submission at the 86th meeting.

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

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

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

Table 2. HCFC consumption limits and phase-out by sector plans 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	11,772.00	8,618.00	5,063.50	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	1,609.90	1,369.60	780.90	780.90
RAC	3,697.7	2,876.0	2,259.7	2,259.70	1,614.10	1,232.60	1,232.60
Solvent	455.2	395.4	321.2	321.2	148.3	55.0	0.0
Servicing and enabling component	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Phase-out by sector							
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	240.30	588.70	-	1,381.60	67.5 in 2026
RAC	821.7	616.3	645.60	381.50	-	2,465.10	70.0 in 2026
Solvent	59.8	74.2	172.9	93.3	55.0	455.2	100 in 2026
Servicing and enabling component		734.0	n/a	n/a	n/a	734.0	n/a
Total	1,930.7	3,300.8	3,581.10	2,408.90	550.00	11,771.50	n/a

Submission to the 88th meeting

25. Relevant bilateral and implementing agencies submitted requests for the third tranches of the PU foam and RAC sector plans and for the fourth tranches of the XPS foam, ICR, refrigeration and air-conditioning servicing, and solvent sector plans. A summary of the funding approved so far and the funding being requested at the 88th meeting is shown in Table 3.

Table 3. Funding tranche requests for sector plans of stage II of the HPMP (US \$)

Sector plan (lead and co-operating agencies)	Funding approved	Funding requested
XPS foam (UNIDO, Germany)	26,405,298	5,000,000
PU foam (World Bank)	9,112,039	4,000,000
ICR (UNDP)	35,464,531	9,000,000
RAC (UNIDO, Austria, Italy)	31,562,981	4,500,000
Solvent (UNDP)	19,545,909	2,500,000
Servicing and enabling programme (UNEP, Germany, Japan)	7,329,132	2,000,000
Total	129,419,890	27,000,000

Status of ratification of the Kigali Amendment

26. On 17 June 2021, the Permanent Mission of the People's Republic of China to the United Nations deposited its acceptance letter 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 Kigali Amendment entered into force in China on 15 September 2021. Following the acceptance of the Kigali Amendment, China is conducting the revision of the Regulation, with the purpose of including HFC in its jurisdictional scope and further enhancing the legal liabilities for illegal activities involving controlled substances.

HCFC consumption

27. The Government of China has reported HCFC consumption for 2020 under Article 7 of the Montreal Protocol as shown in Table 4.

Table 4. HCFC consumption in China (2016 to 2020) (Article 7)

Year	2016	2017	2018	2019	2020	Starting point
Metric tonnes (mt)						
HCFC-22	168,687	172,970	178,658	*173,656	133,450	209,006
HCFC-123	943	990	991	958	868	507
HCFC-124	67	(6)	5	38	(23)	140
HCFC-133/133a	0	0	0	0	(17)	0
HCFC-141b	39,144	40,039	38,057	38,449	28,976	53,502
HCFC-142b	9,471	10,253	5,367	6,500	2,149	22,624
HCFC-225ca/cb	38	38	38	0.57	0	17
Total	218,350	224,284	223,105	219,600	165,404	285,796
ODP tonnes						
HCFC-22	9,278	9,513	9,826	9,551	7,340	11,495
HCFC-123	19	20	20	19	17	10
HCFC-124	1	(0.13)	0.12	0.83	(0.51)	3
HCFC-133/133a	0	0	0	0	(1.08)	0
HCFC-141b	4,306	4,404	4,186	4,229	3,187	5,885
HCFC-142b	616	666	349	422	140	1,471
HCFC-225ca/cb	1	1	1	0.017	0	1
Total	14,221	14,604	14,382	14,223	10,683	18,865

* The Government of China reported a consumption of 173,662 mt under the 2019 CP report.

28. HCFC consumption in China continues to be dominated by three substances: HCFC-22, HCFC-141b and HCFC-142b, which collectively account for 99.9 per cent of the country's consumption (in ODP tonnes). Overall HCFC consumption in 2020 was 24.8 per cent lower (in ODP tonnes) than in 2019 and was in compliance with the 35 per cent reduction target established by the Montreal Protocol. The reductions in HCFC consumption per sector are discussed in the detailed stand-alone progress reports on the implementation of the XPS foam, PU foam, ICR, RAC, solvent, and refrigeration servicing sector plans, attached to this Note by the Secretariat.

29. The Government of China has reported country programme (CP) data for 2020. Table 5 presents HCFC consumption per sector for 2020, confirming compliance with the manufacturing sector consumption limits set out in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4 and 1.3.5 of Appendix 2-A of the Agreement between the Government of China and the Executive Committee for stage II of the HPMP.

Table 5. Consumption of HCFC (in ODP tonnes) per sector in China in 2020*

Substance	XPS foam	PU foam	ICR	RAC	Solvent	Servicing
HCFC-22	1,265.00	0.00	1,540.00	1,595.00	0.00	2,939.77
HCFC-141b	0.00	2,879.41	0.00	0.00	308.00	0.0
HCFC-142b	97.50	0.00	4.23	0.00	0.00	37.98
HCFC-123	0.00	0.00	10.20	0.00	0.00	7.16
HCFC-124	0.00	0.00	0.00	0.00	0.00	(0.51)
Total	1,362.50	2,879.41	1,554.43	1,595.00	308.00	2,984.40
Maximum allowable consumption	1,397.00	2,965.70	1,609.90	2,259.70	321.20	n/a

* Data is from the CP report, the distribution between ICR and RAC sectors is submitted by the implementing agencies.

30. The Government of China continued to monitor the consumption in each sector. Every year, the Foreign Environmental Cooperation Centre (FECO) collects data from different 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 the enterprises only for some sectors (such as RAC, with limited consuming enterprises) and substances (HCFC-22). For sectors with a large number of small and medium-sized enterprises (SMEs) (i.e., XPS foam, PU foam, ICR, and servicing) consumption is monitored through the national system of licensing and quotas for HCFC imports, exports, production and consumption. The domestic production quotas control HCFCs sold on the local market and their subsequent consumption by SMEs. Quotas are also issued to enterprises in each sector with annual consumption of over 100 mt HCFCs.

31. In addition, FECO is cooperating with the local Ecology and Environment Bureaus (EEBs) to strengthen policies that support the reduction of HCFC consumption, including a ban on new HCFC-based manufacturing facilities.

Verification of consumption of HCFCs in China

32. The World Bank commissioned an independent verification of 2019 and 2020 HCFC production and consumption in China that confirmed that the consumption of HCFCs in 2019 and 2020 was within the limits established by the Agreement for the consumption sector.⁷

Verification of the manufacturing sector conversions

33. UNDP and UNIDO submitted technical verification reports to verify the completed conversions in 2019 and 2020 in the XPS foam, ICR, RAC, and solvent sectors, in line with paragraph 5(c) of the Agreement. No verification reports were required for the PU foam sector, where the first projects were only completed in 2021. The verification reports confirmed the completion of these projects, and the amounts of HCFC phased out, and provided reassurance on the commitment from converted enterprises to not revert to the use of HCFCs. An overview of the sector verifications undertaken is shown in Table 6.

⁷ The verification was conducted virtually. The World Bank will submit to the last meeting of 2022 an addendum to the 2019 and 2020 verification reports of the HCFC production sector in China to provide additional information based on in-person visits to the production facilities

Table 6. Overview of sector verifications

Sector	Number of lines and enterprises	Verified phase-out of HCFCs	
		mt	%
XPS foam	7 lines in 4 enterprises	1,649.22	*59
ICR	2 lines in 2 enterprises	610.65	63
RAC	2 lines in 2 enterprises	959.23	43.2
Solvent	47 lines in 3 enterprises	147.91	21.0

* 59 per cent of HCFCs phased out through funded conversions in 2019-2020.

Overview of progress

34. 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 the overall compliance of each manufacturing sector, including the application of quota permits to enterprises consuming more than 100 mt of HCFCs per year, resulting in compliance with all manufacturing sector consumption limits during the years of implementation;
- (b) *XPS foam sector*: The contract between FECO and UNIDO was signed in September 2017. Out of the 11 identified XPS foam enterprises (with a total consumption of 4,522 mt of HCFC-22 and HCFC-142b), 10 enterprises consuming 4,297 mt of HCFCs were verified, signed contracts with FECO for conversion to CO₂-based technology and completed their conversion, including project acceptance;
- (c) *PU foam sector*: The contract between FECO and the World Bank was signed in January 2019. A total of 43 PU foam enterprises submitted project applications to participate, and upon verification of their baseline information, 11 enterprises (with a total consumption of 1,189 mt of HCFC-141b) were selected and have signed contracts with FECO for conversion to water-blown, hydrofluoroolefin (HFO) or cyclopentane foam-blowing technology. Eight enterprises (830 mt) have fully completed their conversion to water, HFO or cyclopentane; the three remaining enterprises (359 mt) have converted to cyclopentane and are in the process of preparing for environmental and safety approval, expected to be completed in 2022;
- (d) *ICR sector*: Contracts were signed with 12 enterprises for the conversion of 18 manufacturing lines to phase out 2,557.42 mt of HCFC-22, after verification of the baseline consumption and capacity of these lines. One line conversion has been financially completed; six lines have achieved national acceptance; six lines have completed production-line conversion and are expected to go through national acceptance by the end of December 2021; two lines are in the process of production-line conversion and are expected to complete the conversion by December 2021; two lines have completed the design and procurement contracts; and one additional line that has completed the design and procurement milestone needs to relocate the workshop, which will delay completion of the conversion to December 2021.
- (e) *RAC manufacturing sector*: The second tranche agreement between FECO and UNIDO was signed in June 2019. Five RAC manufacturing and four compressor manufacturing enterprises signed agreements to convert their RAC manufacturing lines to R-290, resulting in the phase-out of 2,221.12 mt of HCFC-22. Of those enterprises, two RAC manufacturing enterprises and one compressor manufacturer completed their conversion; bidding on equipment and contracts for all other enterprises have been signed, with equipment delivered to three enterprises, and equipment for the remaining enterprises expected to be

delivered by December 2021. Of the 13 research and development (R&D) projects for the introduction of R-290 technology, 11 contracts had been signed, and bidding for the remaining two had been concluded; the projects are expected to be completed between 2022 and 2023;

- (f) *Solvent sector*: FECO signed contracts with the first 24 enterprises with a total consumption of 1,176.29 mt (129.38 ODP tonnes) of HCFC-141b; all these have been verified and are in various stages of implementation. Eleven enterprises have completed their conversion to various non-ODS cleaning technologies,⁸ phasing out 502.14 mt (55.24 ODP tonnes) of HCFC-141b and receiving national acceptance. One enterprise withdrew its participation in the project because it had shut down, and returned the allocated funding for reprogramming; and
- (g) *Refrigeration servicing sector*: The project cooperation agreement for the third tranche of the refrigeration servicing sector and enabling components between FECO and UNEP was signed in May 2020, and funds were transferred to FECO in June 2020. Agreements and contracts were signed with 15 training centres for training on good refrigeration servicing practices; 4,637 trainers and technicians were trained as of June 2021; contracts were signed with selected manufacturers of air conditioners and commercial refrigeration equipment, resulting in 20,000 technicians trained in the after-sales training programme; 37 technicians were trained in good servicing practices, particularly for ammonia-based systems in the cold chain sub-sector; a contract was signed in March 2021 with the China Refrigeration and Air-Conditioning Industry Association (CRAA) to develop operational specifications for detection of refrigerant leakage, and to address the technical requirements in the servicing and maintenance process through data collection and recording. The first draft of the code for the servicing and maintenance of heat pumps, focusing on refrigerant emissions, was finalized and is currently under technical review; the technical standards on tools and equipment for training refrigeration servicing technicians is under development. Agreements with three of the five pilot cities (Henan, Shandong and Shenzhen) were signed in October 2020; data surveys to develop a database of technicians in these cities are being conducted as part of the ODS Management Information System; activities to promote pilot ODS recycling and technician certificate systems and outreach of alternative technologies have been initiated as part of these agreements. Awareness-raising through the “OzonAction in China” website, in both Chinese and English, with information on the country’s implementation of the Montreal Protocol, targets the general public; an outreach video and bilingual brochure were produced on the country’s achievements in the implementation of the Montreal Protocol; various promotional materials were developed to support relevant outreach activities; and the International Ozone Day celebrations were organized. In support of the ODS Import and Export Management Office (I/E Office), new training material for customs officers was developed; 360 staff from the ODS import and export companies, 136 customs officers and 55 officials from local commercial departments were trained; and technical support was provided to local customs offices.

Disbursement of funds

35. As of August 2021, of the US \$129,419,890 approved for the first, second and third tranches, US \$102,041,790 had been disbursed from implementing agencies to FECO, and US \$82,355,885 had been disbursed from FECO to beneficiaries,⁹ as summarized in Table 7.

⁸ I.e., solvent, modified alcohol, water-based cleaning, nano-silicon carbonate, F-solvents, and naphthenic aromatics.

⁹ 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

Table 7. Level of disbursement per sector (as of August 2021)

Sector		Tranche 1	Tranche 2	Tranche 3	Total
XPS foam (UNIDO/Germany)					
Funds approved		7,514,867	9,000,000	9,890,431	26,405,298
Disbursement from implementing agencies to FECO	Amount (US \$)	7,514,867	9,000,000	9,890,431	26,405,298
	Ratio (%)	100	100	100	100
Disbursement from FECO to beneficiaries	Amount (US \$)	5,660,095	8,806,530	9,643,560	24,110,185
	Ratio (%)	75	98	98	91
PU foam (World Bank)					
Funds approved		7,045,027	2,067,012	0	9,112,039
Disbursement from the World Bank to FECO	Amount (US \$)	7,045,027	1,033,506	0	8,078,533
	Ratio (%)	100	50	0	89
Disbursement from FECO to beneficiaries	Amount (US \$)	7,027,872	725,401	0	7,753,273
	Ratio (%)	99.8	35	0	85
ICR (UNDP)					
Funds approved		13,368,756	20,000,000	2,095,775	35,464,531
Disbursement from UNDP to FECO	Amount (US \$)	13,368,756	20,000,000	998,148	34,366,904
	Ratio (%)	100	100	48	97
Disbursement from FECO to beneficiaries	Amount (US \$)	12,394,660	13,113,783	737,052	26,245,495
	Ratio (%)	93	66	35	74
RAC (UNIDO/Italy)					
Funds approved		15,562,981	16,000,000	0	31,562,981
Disbursement from implementing agencies to FECO	Amount (US \$)	4,371,327	4,740,000	0	9,111,327
	Ratio (%)	28	30	0	29
Disbursement from FECO to beneficiaries	Amount (US \$)	3,713,046	3,360,980	0	7,074,026
	Ratio (%)	24	21	0	22
Solvent (UNDP)					
Funds approved		2,821,937	3,777,190	12,946,782	19,545,909
Disbursement from UNDP to FECO	Amount (US \$)	2,796,937	3,741,089	10,357,426	16,895,452
	Ratio (%)	99	99	80	86
Disbursement from FECO to beneficiaries	Amount (US \$)	2,796,937	*3,742,190	6,604,184	13,143,311
	Ratio (%)	99	99	51	67
Servicing (UNEP/Germany/Japan)					
Funds approved		3,679,132	2,650,000	1,000,000	7,329,132
Disbursement from implementing agencies to FECO**	Amount (US \$)	3,619,276	2,640,000	925,000	7,184,276
	Ratio (%)	98	99.6	93	98
Disbursement from FECO to beneficiaries	Amount (US \$)	2,356,558	1,312,702	360,335	4,029,595
	Ratio (%)	64	50	36	55
Total for all sectors					
Funds approved by the Executive Committee		49,992,700	53,494,202	25,932,988	129,419,890
Disbursement to FECO	Amount (US \$)	38,716,190	41,154,595	22,171,005	102,041,790
	Ratio (%)	77	77	86	79
Disbursement from FECO to beneficiaries	Amount (US \$)	33,949,168	31,061,586	17,345,131	82,355,885
	Ratio (%)	68	58	67	64

* Total disbursement for the second tranche is US \$3,741,089 plus US \$1,101 (interest accrued up to December 2016 and offset from the transfer for the second tranche, according to decision 80/17(b)), for a total of US \$3,742,190.

** Reference for disbursement in the servicing sector.

36. At the time of submission of the tranche requests (twelve weeks before the 88th meeting), the rate of disbursement of funding from FECO to beneficiaries was above 20 per cent in the XPS foam, PU foam, ICR, RAC, solvent and refrigeration servicing sectors.

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).

Implementation under COVID-19

37. The COVID-19 pandemic has affected the implementation of stage II of the HPMP in different ways, requiring a number of measures to be taken by the Government of China and the bilateral and implementing agencies to continue the implementation of the sector plans. As the enterprises included in the HPMP are located in provinces and cities that were impacted in a variety of ways and required different adjustments, clarifications regarding the response to the pandemic are provided under each sector plan.

Financial report for project implementation and monitoring unit (PMU) expenditures under the HPMP and HPPMP

38. In line with decision 81/46(a), UNDP had submitted the PMU expenditures for stage I and stage II of the HPMP as of December 2020,¹⁰ as presented in Annex II of the present document.

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

39. In line with decision 69/24, information on interest accrued as of the end of 2020 was provided through an audit report on the disbursements for stage I and stage II of the sector plans under the HPMP for 2020 submitted by UNDP on 8 September 2021, as shown in Table 8. The audit report also indicated that “the financial statement of project grant and disbursement of the HPMP (stages I and II) complies with the rules of the Montreal Protocol on ODS and the Chinese Institution Accounting Standard. The statement of project grant and expenditure has been fairly and justly presented in all material respects from 1 January to 31 December 2020 by FECO.”

Table 8. Information provided on interest accrued (US \$)

Sector plan	Stage I	Stage II	Total
XPS foam (UNIDO/Germany)	-	-	-
PU foam (World Bank)	-	989	989
ICR (UNDP)	29,110	43,449	72,559
RAC (UNIDO)	6,986	10,709	17,695
Solvent (UNDP)	-	1,133	1,133
Servicing (UNEP /Japan)	-	7,107	7,107
Total all sectors	36,095	63,387	99,482

Tranche progress reports and funding requests

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

41. The Secretariat notes that the Government of China has been in compliance¹¹ with the HCFC consumption targets established for each sector, that substantive progress and funds disbursement have been achieved in all sectors, and that all technical and cost issues have been resolved.

Secretariat’s recommendation

42. The Executive Committee may wish to request the Treasurer, with regard to the interest accrued by the Government of China up to 31 December 2020 from funds previously transferred for the implementation

¹⁰ Annex III of document UNEP/OzL.Pro/ExCom/84/42

¹¹ Based on the verified consumption in 2019 and 2020.

of sector plans under stages I and II of the HCFC phase-out management plan (HPMP), as per decisions 69/24 and 77/49(b)(iii):

- (a) To offset future transfers to the World Bank by US \$989, representing interest accrued from funds previously transferred for the implementation of the polyurethane foam sector plan under stage II of the HPMP;
- (b) To offset future transfers to UNDP by US \$72,559, representing interest accrued from funds previously transferred for the implementation of the industrial and commercial refrigeration sector plan under stages I and II of the HPMP;
- (c) To offset future transfers to UNIDO by US \$17,695, representing interest accrued from funds previously transferred for the implementation of the room air-conditioning sector plan under stages I and II of the HPMP;
- (d) To offset future transfers to UNDP by US \$1,133, representing interest accrued from funds previously transferred for the implementation of the solvent sector plan under stage II of the HPMP; and
- (e) To offset future transfers to UNEP by US \$7,107, representing interest accrued from funds previously transferred for the implementation of the refrigeration servicing sector plan and the national enabling programme under stage II of the HPMP.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

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

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	10,682.65 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)					Year: 2020	
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,265.00	3,135.00	2,939.77		7,339.77
HCFC-123			10.20	7.16		17.36
HCFC-124				-0.51		-0.51
HCFC-141b		2,879.41		0.00	308.00	3,187.41
HCFC-142b		97.50	4.23	37.98		139.71

(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) BUSINESS PLAN		2021	2022	2023	Total
UNIDO	ODS phase-out (ODP tonnes)	223.82	101.74	152.60	478.16
	Funding (US \$)	4,708,000	2,140,000	3,210,000	10,058,000
Germany	ODS phase-out (ODP tonnes)	30.52	0.0	0.0	30.52
	Funding (US \$)	673,535	0	0	673,535

(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	
Agreed funding (US \$)**	UNIDO	Project costs	7,514,867	8,732,614	0	9,890,431	4,400,000	2,000,000	3,000,000	1,000,000	4,000,000	3,534,654	44,072,566	
		Support costs	526,041	567,620	0	692,330	308,000	140,000	210,000	70,000	280,000	247,426	3,085,080	
	Germany	Project costs	-	267,386	0	0	600,000	0	0	0	0	0	0	867,386
		Support costs	-	31,877	0	0	73,535	0	0	0	0	0	0	105,412
Funds approved by ExCom (US \$)		Project costs	7,514,867	9,000,000	0	9,890,431	0	0	0	0	0	0	26,405,298	
		Support costs	526,041	599,497	0	692,330	0	0	0	0	0	0	0	1,817,868
Total funds requested for approval at this meeting (US \$)		Project costs					5,000,000						5,000,000	
		Support costs					381,535							381,535

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

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

Secretariat's recommendation:	For individual consideration
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PROJECT DESCRIPTION

43. On behalf of the Government of China, UNIDO as the lead implementing agency has submitted a request for funding for the fourth tranche of the extruded polystyrene (XPS) foam sector plan of stage II of the HCFC phase-out management plan (HPMP), at a total cost of US \$5,381,535, consisting of US \$4,400,000 plus agency support costs of US \$308,000 for UNIDO, and US \$600,000 plus agency support costs of US \$73,535 for the Government of Germany.¹² The submission includes a progress report on the implementation of the third tranche of the XPS foam sector plan, the tranche implementation plan for 2022, and verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee.

Adjustment to stage II of the XPS foam sector plan

44. At the 84th meeting, the Executive Committee adjusted stage II of the HPMP for China and requested bilateral and implementing agencies *inter alia* to submit revised plans of action for each sector plan (decision 84/69). At the 85th meeting, the Executive Committee approved the third tranche of the XPS foam sector plan at US \$9,890,431, plus agency support costs (decision 85/30). At the 86th meeting, the Executive Committee approved the revised plan of action for the XPS foam sector at a total amount of US \$18,534,654, plus agency support costs, for the period 2021-2026; the adjusted total funding approved in principle for stage II of the XPS foam sector plan is US \$44,939,952, plus agency support costs (decision 86/34).

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

Progress report on the implementation of the third tranche of stage II

Investment activities

46. The contract between the Foreign Environmental Cooperation Center (FECO) and UNIDO for the implementation of stage II of the XPS foam sector plan was signed in September 2017. Ten enterprises were selected and have already completed their conversions to CO₂ with other low-GWP co-blowing agents,¹³ phasing out 4,296 mt (247.06 ODP tonnes) of HCFCs, as shown in Table 1.

Table 1. Status of progress of XPS foam enterprises selected in the first three tranches

Status of implementation	Number of enterprises	HCFC consumption in 2016*		Value of contracts (US \$)
		Mt	ODP tonnes**	
Project completed (passed project acceptance)	10	4,296.80	247.06	24,263,130

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

** A mixture of HCFC-22 and HCFC-142b at a ratio of 75:25 (measured in mt), is used as foam blowing agent.

¹² As per the letter of 23 August 2021 from the Ministry of Ecology and Environment of China to UNIDO.

¹³ Alcohol for XPS board thickness below 60 mm; CO₂ and small amounts of HFC-152a (GWP of 124) for XPS board thickness above 60 mm.

Verification of converted manufacturing lines

47. In accordance with paragraph 5(c) of the Agreement, UNIDO commissioned the verification of seven manufacturing lines in four of the XPS foam enterprises that have been converted to CO₂, with an associated phase-out of 1,649 mt (93.40 ODP tonnes) of HCFCs. This represents 38 per cent of the amount of HCFCs phased out so far under stage II. The verification reports confirmed *inter alia* that the enterprises permanently ceased the use of HCFCs for XPS foam and started manufacturing with CO₂-based technology in line with the relevant national product standards. The verifications also confirmed that the allocation of funds was transparent and within the cost-effectiveness thresholds; that there was no capacity upgrade in the conversions; and that the replaced baseline equipment was destroyed. The incremental operating costs (IOCs) for the manufacturers increased as the new CO₂-based technology could only work with virgin raw material, and the substantial co-finance on capital and operating costs by the enterprises confirms the sustainability of the project.

TA activities

48. TA activities implemented from 2020 to 2021 include technical support provided by the implementation support agency (ISA) to FECO and the enterprises for day-to-day operations, on-site baseline verifications and project acceptance processes; support by an accounting firm to review financial material submitted by beneficiaries and to conduct on-site performance verifications with the ISA; and two training workshops on the implementation of safety measures in XPS foam production with CO₂-based technology, including on-site training at eight enterprises.

Gender policy implementation

49. In line with the Multilateral Fund operational policy on gender mainstreaming (decision 84/92), the implementation of stage II of the XPS foam sector plan will continue to take into account gender mainstreaming activities, such as encouraging the engagement of women in planning, policy and decision making, brainstorming and consultancy, monitoring and evaluation. Women have been invited to participate in such events and activities organized under stage II as meetings, training sessions, workshops, capacity-building and outreach activities. Outreach and training materials to be developed will highlight gender issues and promote gender equity where applicable. Gender issues are also expected to be incorporated into the thematic workshops to share experiences and lessons learned on gender mainstreaming.

Level of fund disbursement

50. As of August 2021, of the US \$26,405,298 approved so far, US \$24,110,185 (91.31 per cent) had been disbursed by FECO to beneficiary enterprises. Table 2 presents the overall status of disbursements.

Table 2. Status of disbursements for the XPS foam sector plan (as of August 2021)

Description		Tranche 1	Tranche 2	Tranche 3	Total
Funds approved (US \$)	UNIDO	7,514,867	8,732,614	9,890,431	26,137,912
	Germany	0	267,386	0	267,386
	Total	7,514,867	9,000,000	9,890,431	26,405,298
Disbursements from implementing agencies to FECO (US \$)	UNIDO	7,514,867	8,732,614	9,890,431	26,137,912
	Germany*	0	267,386	0	267,386
	Total	7,514,867	9,000,000	9,890,431	26,405,298
	Ratio (%)	100	100	100	100
Disbursements from FECO to beneficiaries (US \$)	Total	5,660,095	8,806,530	9,643,560	24,110,185
	Ratio (%)	75	98	98	91

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

Implementation plan for the fourth tranche of stage II

51. FECO will continue enforcing the quota permits for XPS foam enterprises consuming more than 100 mt of HCFCs per year and will start the process of converting the additional 11 enterprises¹⁴ to CO₂-based technology, by reviewing their implementation plans, signing conversion sub-contracts, supervising the conversions and providing technical and safety assistance.

52. TA activities will include continuous technical support by the ISA in the enterprises' conversions; public awareness activities to support the sector conversion to low-GWP alternatives (i.e., conferences, publications, articles, brochures and other materials addressed to XPS foam enterprises and relevant stakeholders); two additional workshops for XPS foam enterprises, equipment suppliers, experts, local ecology and environment bureaus (EEBs), firefighting bureaus, research institutes and other relevant agencies to support the sector transition to low-GWP technologies; revision of a product standard ("XPS foam for foundation insulation prior to floor heating"); optimization of CO₂-based technology through research on the use of heat gluing technology to produce XPS foam thicker than 60 mm; and a study tour to exchange information with other countries in Europe on policy and alternative low-GWP technologies in XPS foam, including advances in heat gluing technology. Table 3 presents the budget for the activities to be carried out during the implementation of the fourth tranche.

Table 3. Budget for the fourth tranche of the XPS foam sector plan in China

Activity	Budget (US \$)
Conversion of XPS foam enterprises to CO ₂ technology	3,956,026
TA:	783,312
- ISA technical support, supervision and verification (UNIDO) (US \$201,974)	
- Technical workshops, revision of standards, optimization of CO ₂ -based technology, awareness activities (Germany) (US \$581,338)	
Project monitoring, including:	260,662
- Project and support staff (US \$154,051)	
- Operating costs: daily operating expenses, domestic travel, meetings, office facilities and equipment (US \$97,227)	
- Consulting services (US \$9,384)	
Total	5,000,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

53. Consumption of HCFCs in the XPS foam manufacturing sector in 2020 was 24,500 mt (1,362.50 ODP tonnes), which is below the 1,397 ODP tonnes allowable consumption in the Agreement between the Government of China and the Executive Committee, as shown in Table 4.

Table 4. Consumption of HCFCs in the XPS foam sector

Description	2016	2017	2018	2019	2020	
Consumption*	mt	35,500	38,500	34,000	33,500	24,500
	ODP tonnes	2,043	2,213	1,920	1,898	1,363
Maximum allowable consumption**	mt	39,755	39,755	35,339	35,339	24,296
	ODP tonnes	2,286	2,286	2,032	2,032	1,397
Phase-out targets	mt			4,416		11,043
	ODP tonnes	n/a	n/a	254	n/a	635

* 2014-2020: As per the country programme implementation report.

** As per the Agreement signed at the 67th meeting for stage I up to 2015, and as per the Agreement signed at the 86th meeting for stage II from 2016 to 2019.

¹⁴ The consumption of HCFCs by these 11 enterprises is still to be confirmed.

54. Since 2016, the demand for XPS foam products for insulation has increased, with an associated increase in the consumption of HCFCs. Reductions in HCFC consumption since 2017 have been achieved through the conversion of XPS foam enterprises, strict implementation of the HCFC production quota, the domestic sales quota issued for each producer and HCFC consumption quotas for manufacturing enterprises using more than 100 mt.

Status of progress

55. To achieve 2020 consumption of 1,362.50 ODP tonnes, the XPS foam sector in China phased out 535.50 ODP tonnes from the 1,897.50 ODP tonnes of HCFCs consumed in 2019. The Secretariat notes that 247.06 ODP tonnes were phased out by the conversion of 10 enterprises. UNIDO explained that the remaining reductions to reach the 2020 target were achieved by the implementation of policy measures, including the quotas on HCFC production, import, and export, quotas for large consumers, the registration of enterprises, and the supervision and monitoring of these enterprises by EEBs. In addition to the ongoing activities, during the upcoming tranches the Government of China will increase technical support, training and supervision to strengthen the industry's technical capacity to adopt low-GWP alternatives and ensure that further reductions are achieved and sustained.

56. UNIDO indicated that the main challenges identified in the adoption of CO₂-based technology in the XPS foam sector in China so far have been safety requirements when using ethanol, and a slight reduction in thermal insulation performance. These issues have been addressed through plant safety conditioning, including forced ventilation systems inside the factory, fire-extinguishing systems, anti-static systems, combustible gas concentration detection and control systems, automatic quenching systems, emergency power generation systems and explosion-proof retrofitting of foaming equipment. Enterprises also provide regular safety training to improve workers' awareness of production safety. The slightly lower performance issue is being addressed through research on CO₂-based technology optimization and production-process improvement. Technical standards for XPS foam products are also being updated to support the adoption of the technology.

57. Noting that the verified enterprises had estimated high IOCs due to the need to use new rather than recycled resin,¹⁵ the Secretariat enquired whether this would represent a risk of returning to HCFCs, as the enterprises would have to pay for most of the IOC (the project would pay only around US \$1.00/kg for one year) and as there were still non-converted enterprises that might be competing at a lower production cost. UNIDO explained that these IOCs were estimated based on the cost of HCFCs before conversion; however, with the implementation of quotas over the years and the reduction of market supply, the price of HCFCs and, consequently, the cost of products made using HCFCs have increased. In addition, the foam product with CO₂-based technology exhibits property advantages in some aspects, such as compressive strength.

58. At present, a large number of enterprises are planning to phase out HCFCs, but many of them, especially small and medium-sized enterprises (SMEs), have insufficient technological capacity to use CO₂-based technology. During the next tranches, the Government of China will continue implementing TA activities to facilitate the conversion to low-GWP alternatives by a large number of SMEs. This will include training on technical formulas, equipment, on-site start-up technologies, product testing, and safety.

Project management unit (PMU)

59. UNDP as the overall 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

¹⁵ As indicated by UNIDO during the discussions for the approval of stage II of the XPS foam sector plan, based on previous experience and research, the use of recycled resin with CO₂-based technology reduces the quality of the foam. For this reason, all enterprises are using new resin despite the additional cost for them.

stage II of the XPS foam sector plan implemented by UNIDO are summarized in Table 5.

Table 5. PMU cumulative expenditures for stage II of the XPS foam sector plan from 2017 to 2020

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	580,211
	Domestic travel	95,004
	International travel	3,821
	Domestic meetings	44,876
	International meetings	0
	Consulting service	65,215
Sub-total for sector-specific costs		789,127
Operational costs	Shared costs (support staff, computers, internet, printing, office operation and maintenance)	837,021
Total disbursement *		1,626,148

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

Conclusion

60. The Secretariat notes that the Government of China continues to be in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the XPS foam sector plan, including the reduction target agreed for 2020. There is significant progress in the implementation of the first three tranches of stage II, including the completion of the conversion of 10 enterprises with the phase-out of 4,296.80 mt (247.06 ODP tonnes) of HCFCs and supporting TA activities. In line with paragraph 5(c) of the Agreement, the submission included the verification of the conversion of seven manufacturing lines in four XPS foam enterprises converted to CO₂-based technology, confirming the phase-out of 1,649 mt (93.40 ODP tonnes) of HCFCs. The level of disbursement to beneficiary enterprises is over 97.5 per cent of the funds approved in the third tranche. With funds from the fourth tranche, the Government of China will start the conversion of 11 additional enterprises and continue the policy and TA activities to facilitate the conversion to low-GWP alternatives, including *inter alia* training on technical formulas, equipment, product testing, and safety for a large number of SMEs that have insufficient technological capacity to use CO₂-based technology.

RECOMMENDATION

61. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the third 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 fourth tranche of the XPS foam sector plan of stage II of the HPMP for China, and the corresponding 2022 tranche implementation plan, at the amount of US \$5,381,535, consisting of US \$4,400,000, plus agency support costs of US \$308,000 for UNIDO, and US \$600,000, plus agency support cost of US \$73,535 for the Government of Germany.

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	77 th	100% in 2026

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	10,682.65 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)					Year: 2020	
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,265.00	3,135.00	2,939.77		7,339.77
HCFC-123			10.20	7.16		17.36
HCFC-124				-0.51		-0.51
HCFC-141b		2,879.41		0.00	308.00	3,187.41
HCFC-142b		97.50	4.23	37.98		139.71

(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) BUSINESS PLAN		2021	2022	2023	Total
World Bank	ODS phase-out (ODP tonnes)	628.65	0.0	785.81	1,414.46
	Funding (US \$)	4,280,000	0	5,350,000	9,630,000

(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	0	0	0	0	0	0	9,112,039
		Support costs	493,152	0	0	144,691	0	0	0	0	0	0	0
Total funds requested for approval at this meeting (US \$)		Project costs					4,000,000						4,000,000
		Support costs					280,000						

* 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:	For individual consideration
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PROJECT DESCRIPTION

62. On behalf of the Government of China, the World Bank as the designated implementing agency has submitted a request for funding for the third 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 \$4,000,000, plus agency support costs of US \$280,000.¹⁶ The submission includes a progress report on the implementation of the second tranche, the tranche implementation plan for 2022, and verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee.

Adjustment to stage II of the PU foam sector plan

63. At the 84th meeting, the Executive Committee adjusted stage II of the HPMP for China and requested bilateral and implementing agencies to *inter alia* submit the revised plans of action for each sector (decision 84/69). At the 85th meeting, the Executive Committee approved the second tranche of the PU foam sector plan at US \$2,067,012, plus agency support costs (decision 85/31). At the 86th meeting the Executive Committee approved the revised plan of action for the PU foam sector at a total amount of US \$19,200,000, plus agency support costs, for the period 2021-2026; 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).

64. The original plan was to assist approximately 150 enterprises with HCFC-141b consumption above 20 metric tonnes (mt) and small and medium-sized enterprises (SMEs) through systems houses. The revised plan of action proposes to phase out 379.30 ODP tonnes through the conversion of individual enterprises, and to channel technical assistance (TA), including the development of foam-blowing formulations, through 19 systems houses to downstream enterprises (many of which are SMEs); the number of systems houses or individual conversion projects to be funded may be adjusted according to circumstances that arise during implementation. The sector plan will be supported by policy and TA components, the implementation of which will accelerate given the reduction in the funding level from the original approval.

Progress report on the implementation of the second tranche of stage II

Investment projects

65. The contract between the Foreign Environmental Cooperation Office (FECO) and the World Bank for the implementation of stage II of the PU rigid foam sector plan was signed on 8 January 2019. Out of the 25 PU foam enterprises for which baseline information was verified (i.e., non-Article-5 ownership, baseline equipment, HCFC consumption and financial data), 11 enterprises consuming 1,189 mt of HCFC-141b were selected as beneficiaries and have signed contracts with FECO for conversion to water-blown, hydrocarbon (HC) or hydrofluoroolefin (HFO) technology.

66. To date, eight of these enterprises have completed conversions: to water-based technology (five), HFO (two), and cyclopentane (one), including project acceptance in 2021. The remaining three enterprises have converted to cyclopentane and are in the process of preparing for environmental and safety approval, expected to be completed in 2022. The status of progress of the conversions of the 11 enterprises is presented in Table 1.

Table 1. Status of progress of the PU foam enterprises selected for conversion in the first two tranches

Status of implementation	No. of enterprises	Technology selected	HCFC consumption in 2016*		Contract value (US \$)
			mt	ODP tonnes	
Completed	5	Water-based	611.49	67.26	3,031,455
	2	HFO	167.53	18.43	658,486
	1	HC	51.32	5.65	1,695,072

¹⁶ As per the letter of 23 August 2021 from the Ministry of Ecology and Environment of China to the World Bank.

Status of implementation	No. of enterprises	Technology selected	HCFC consumption in 2016*		Contract value (US \$)
			mt	ODP tonnes	
Completed on-site verification and trial run	3	HC	358.83	39.47	2,789,024
Total	11		1,189.17	130.81	8,174,036

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

Verification of converted manufacturing lines

67. Since the first individual conversion projects in the PU foam sector were only completed in 2021, in line with paragraph 5(c) of the Agreement, the World Bank will submit the relevant verifications along with the next tranche request.

TA activities

68. TA activities implemented between 2020 and 2021 include the assistance provided by the implementation support agency (ISA) to FECO and to enterprises in the implementation of the projects, the financial appraisal and performance verifications at beneficiary enterprises, and ongoing research on the ban on the use of HCFC-141b as blowing agent in the pipe insulation sub-sector.

Monitoring by the Ecology and Environment Bureaus (EEBs)

69. In line with decision 84/39(c)(iii),¹⁷ the Government of China reported through the World Bank that local EEBs continued to exercise their registration systems with HCFC consumers, and to conduct routine monitoring and management of ODS-related enterprises in their regions, with the established enforcement capacities. Since the submission of the last progress report, no illegal production or consumption of CFC-11 has been found.

Gender policy implementation

70. The Government of China, through the project implementation and monitoring unit (PMU), is incorporating gender mainstreaming into the implementation of stage II to the extent possible, in line with the Fund's gender mainstreaming policy (decision 84/92). This includes *inter alia* encouraging the engagement of women in various steps of project implementation, such as planning, policy and decision making, brainstorming and advisory services, monitoring and evaluation. Women are encouraged to participate in events and activities organized under stage II of the HPMP, such as meetings, training sessions, workshops, capacity-building and outreach activities. Gender-sensitive outreach and training materials that promote equity are developed where applicable, and gender issues are being incorporated into various thematic workshops in order to share experiences and lessons learned.

Level of fund disbursement

71. As of August 2021, of the US \$9,112,039 approved, US \$8,078,533 had been disbursed by the World Bank to FECO, and US \$7,753,273 (85 per cent of the total funding approved) had been disbursed by FECO to beneficiary enterprises, as shown in Table 2.

Table 2. Status of disbursements for the PU foam sector plan (as of August 2021)

PU foam sector plan		First tranche	Second tranche	Total
Funds approved		7,045,027	2,067,012	9,112,039
Disbursement from the World Bank to FECO	Amount (US \$)	7,045,027	1,033,506	8,078,533
	Ratio (%)	100	50	89

¹⁷ 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 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.

PU foam sector plan		First tranche	Second tranche	Total
Disbursement from FECO to beneficiaries	Amount (US \$)	7,027,872	725,401	7,753,273
	Ratio (%)	99.8	35	85

Implementation plan for the third tranche of stage II

72. During the third tranche, FECO will complete the conversion to HC of the three remaining enterprises and will start the conversion of an additional 13 enterprises consuming 1,118.16 mt of HCFC-141b: to HFO (six), to water-based technology (five), and to HC (two). Additionally, FECO and the World Bank will further develop the implementation approach that will be utilized to reach SMEs through an estimated 19 systems houses.

73. FECO will also continue enforcing the quota permits for PU foam enterprises that consume more than 100 mt of HCFCs per year, as a supplementary measure to ensure maintaining the compliance target in 2022. A ban on the use of HCFC-141b in the insulation pipe and solar water heater sub-sectors is still being prepared and is expected to be issued in 2022, resulting in the phase-out of about 11,000 mt of HCFC-141b consumption in the PU foam sector.

74. TA activities will include assistance by the ISA to FECO and enterprises in the implementation of new projects, the financial appraisal and performance verifications to new beneficiary enterprises; additional workshops and meetings for relevant stakeholders to promote knowledge sharing and lessons learned; and awareness activities through various media to introduce the development of alternative technologies in the sector in a timely manner, mobilize additional enterprises to participate in future conversion activities, and enhance public awareness on the phase-out of HCFCs.

75. Table 3 presents the budget for the activities included in the implementation of the third tranche.

Table 3. Budget for the third tranche of the PU foam sector plan in China

Activity	Budget (US \$)
Conversion of PU foam enterprises to water-based, HFO and HC technology	3,780,000
Project monitoring, including:	
- Project staff – programme management, support, financial procurement, legal support	132,000
- Domestic travel	11,000
- Domestic meetings	8,800
- Consulting services	8,800
- Operating costs – daily operating expenses, support staff, office facilities and equipment	59,400
Sub-total for project monitoring	220,000
Total	4,000,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

76. Consumption of HCFC-141b in the PU foam manufacturing sector in 2020 was 26,176 mt (2,879.41 ODP tonnes), which is below the 26,961 mt (2,965.7 ODP tonnes) allowable consumption stated in the Agreement between the Government of China and the Executive Committee, as shown in Table 4.

Table 4. HCFC-141b consumption and targets for the PU foam sector

PU foam sector		2014	2015	2016	2017	2018	2019	2020
Consumption*	mt	46,864	34,202	34,821	36,439	34,177	34,290	26,176
	ODP tonnes	5,155.0	3,762.0	3,830.3	4,008.3	3,759.4	3,771.9	2,879.4
Maximum allowable consumption**	mt	49,018	40,451	40,451	40,451	34,314	34,314	26,961
	ODP tonnes	5,392.2	4,449.6	4,449.6	4,449.6	3,774.5	3,774.5	2,965.7

PU foam sector		2014	2015	2016	2017	2018	2019	2020
Phase-out targets	mt	n/a	8,569	n/a	n/a	6,137	n/a	7,353
	ODP tonnes	n/a	942.6	n/a	n/a	675.1	n/a	808.8

* As per the country programme implementation report.

** As per the Agreement for stage I of the HPMP up to 2015 approved at the 67th meeting, and as per the Agreement for stage II from 2016 to 2019 approved at the 86th meeting.

77. Following an increase in 2016 and 2017 owing to economic development and policies enacted in various provinces requiring the insulation of buildings, HCFC consumption in the PU foam sector decreased between 2018 and 2020, due in part to conversions of PU foam enterprises to low-GWP alternatives under stages I and II of the HPMP.

78. The Government of China needed to reduce consumption by 806.2 ODP tonnes, from 3,771.9 ODP tonnes in 2019 to 2,965.7 ODP tonnes in 2020. Noting that the amount of HCFCs phased out by the eight projects fully completed in 2021 was only 91.34 ODP tonnes, the Secretariat sought an explanation on how the phase-out was achieved. The World Bank explained that reductions were achieved by the implementation of regulatory measures, including the ban on the use of HCFC-141b as a blowing agent in the sub-sectors of reefer containers, refrigerators and freezers, and in small household appliances (which were fully converted in stage I of the HPMP) starting on 1 January 2019; the production quota system for domestic use; and consumption quota management for large enterprises with HCFC consumption of more than 100 mt.

79. As a result of these actions, alternative technologies are becoming more widely known, accessible and accepted by the industry. With production closure, the price of HCFC-141b is increasing, leading to additional funded and self-funded conversions by PU foam enterprises. To facilitate these conversions and ensure a sustained phase-out, FECO continues to closely collaborate with the foam association to conduct technical training sessions and workshops to disseminate policy requirements, developments in alternative technologies and safe practices in production with flammable blowing agents. The Ministry of Environment and Ecology and the local EEBs continue to conduct monitoring and supervision of the enterprises.

Status of progress

80. The Secretariat noted the substantive progress achieved in the conversion of eight individual PU foam enterprises and in technical assistance activities. Upon request, the World Bank explained that in the case of the PU foam sector, the pandemic has not significantly affected project implementation, with the exception of certain delays in the arrival of imported equipment that prevented the last three projects from being completed as originally scheduled. There have also been challenges in carrying out on-site completion verification/project acceptance at the enterprises due to intermittent travel restrictions. To ensure the smooth execution of projects and planned activities during the periods of restrictions on domestic travel, FECO and the association conducted virtual meetings with beneficiaries and relevant stakeholders. The World Bank has continued providing regular implementation support, including three virtual missions since the start of the pandemic and regular working-level meetings to review the progress of the project.

81. In the revised action plan for the PU foam sector, the Government of China has delayed the planned date of issuance of the ban on the use of HCFC-141b in the pipe insulation and solar water heater sub-sectors from 2019/2020 to 2022 to allow more time for the industry to adapt to low-GWP technologies, in light of the delays that the COVID-19 pandemic has caused in their operations and investments.

Plan of action

Systems-house component

82. Noting that the third tranche will prioritize the conversion of an additional 13 individual enterprises, while the assistance to smaller enterprises through systems houses will only be initiated, the Secretariat requested a clarification on the estimated timeline for conversions of the SMEs, which will be more

labour-intensive and will involve a larger number of enterprises.

83. The World Bank explained that the concept for the delivery mechanism for the systems-house component of the sector plan as a key player for the conversion of SMEs has already been prepared, reviewed and discussed. Currently FECO is undertaking additional consultations with the foam association and systems houses to finalize the arrangements for this new approach, expected by early 2022, and to start on a pilot basis with five systems houses that cover different alternatives, different geographic areas that have a high concentration of foam enterprises to gather experience on the approach and to achieve a more effective and impactful implementation with the remaining systems-house projects.

84. The systems houses would be requested to convert their production capacity to develop water/HFO pre-blended-based formulations within 12 months and pre-blended HC-based formulations within 18 months. They would then provide TA to downstream enterprises. The estimated time for conversion of downstream users would depend on the specific alternative technologies selected, the time at which they receive TA from the systems houses, as well as the timing of issuance of sector policies during the implementation of the sector plan, but it is expected that the conversions will be completed within the duration of stage II.

PMU

85. UNDP as the lead implementing agency for the HPMP for China provided a cumulative report on PMU expenditures, in line with decision 81/46(b). Based on that report, expenditures related to the PMU under stage II of the PU foam sector implemented by the World Bank are summarized in Table 5.

Table 5. PMU expenditures for stage II of the PU foam sector plan from 2017 to 2020

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	872,460
	Domestic travel	63,246
	International travel	0
	Domestic meetings	33,262
	International meetings	0
	Consulting services	44,354
Sub-total for sector-specific costs		1,013,322
Operational costs	Shared costs (support staff, computers, internet, printing, office operation and maintenance)	487,633
Total disbursement *		1,500,955

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

Conclusion

86. The Secretariat notes that the Government of China continues to be in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the PU foam sector plan. There is significant progress in the implementation of the second tranche of stage II, including several TA activities and the completion of eight conversion projects, plus additional three conversion projects close to completion. Funding from the third tranche is required to convert an additional 13 individual enterprises consuming 1,118.16 mt (123 ODP tonnes) of HCFC-141b, to initiate the conversion of SMEs through systems houses and to continue implementing TA activities and policy and regulatory measures to ensure that HCFC consumption in the sector is reduced and maintained below the maximum allowable consumption level stated in the Agreement.

RECOMMENDATION

87. The Executive Committee may wish to consider:
- (a) Noting the progress report on the implementation of the second 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 third tranche of the PU foam sector plan of stage II of the HPMP for China, and the corresponding 2022 tranche implementation plan, in the amount of US \$4,000,000, plus agency support costs of US \$280,000 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	77 th	33% by 2020

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	10,682.65 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)					Year: 2020	
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,265.00	3,135.00	2,939.77		7,339.77
HCFC-123			10.20	7.16		17.36
HCFC-124				-0.51		-0.51
HCFC-141b		2,879.41			308.00	3,187.41
HCFC-142b		97.50	4.23	37.98		139.71

(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) BUSINESS PLAN		2021	2022	2023	Total
UNDP	ODS phase-out (ODP tonnes)	182.43	0.0	162.16	344.59
	Funding (US \$)	9,630,000	0	8,560,000	18,190,000

(VI) PROJECT DATA		2016	2017	2018 2019	2020*	2021	2022	2023	2024	2025	2026	Total
Montreal Protocol consumption limits (ODP tonnes)		17,342.1	17,342.1	17,342.1	12,524.9	12,524.9	12,524.9	12,524.9	12,524.9	6,262.4	6,262.4	n/a
Maximum allowable consumption (ODP tonnes)		2,162.5	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		0	0	0	0	0	35,464,531
	Support costs	935,813	1,400,000	0	146,704		0	0	0	0	0	2,482,517
Total funds requested for approval at this meeting (US \$)	Project costs					9,000,000						9,000,000
	Support costs					630,000						630,000

* 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 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:	For individual consideration
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PROJECT DESCRIPTION

88. On behalf of the Government of China, UNDP as the designated implementing agency has submitted a request for funding for the fourth tranche of the industrial and commercial refrigeration and air-conditioning (ICR) sector plan of stage II of the HCFC phase-out management plan (HPMP), at the amount of US \$9,000,000, plus agency support costs of US \$630,000.¹⁸ The submission includes the progress report on the implementation of the third tranche, the tranche implementation plan for 2021 to 2023, and verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee.

Adjustment to stage II of the ICR sector plan

89. At the 84th meeting, the Executive Committee adjusted stage II of the HPMP for China and requested bilateral and implementing agencies *inter alia* to submit revised plans of action for each sector plan (decision 84/69). At the 86th meeting, the Executive Committee approved the revised extended plan of action for the ICR sector at a total amount of US \$32,693,710, plus agency support costs, for the 2021-2026 period; the adjusted total funding approved in principle for the entire stage II of the ICR sector plan (2016-2026) is US \$68,158,241, plus agency support costs of US \$4,771,076 (decision 86/34).

90. The stage II extension (2020-2026) will reduce 15,225.28 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 mt will be phased out through the conversion of manufacturing lines to low-global-warming-potential (GWP) technologies; and 13,245.28 mt will be phased out through the conversion of compressors, policy and regulatory measures, TA activities, and a reduction in foreign-owned enterprises. Funding of the stage II extension was planned in four tranches: 2021, 2023, 2025 and 2026.

Progress report on the implementation of the third tranche of stage II

Enterprise-level activities

91. Contracts were signed with 12 enterprises for the conversion of 18 manufacturing lines to phase out 2,557.42 metric tonnes (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.¹⁹ One line conversion has been financially completed; six lines have achieved national acceptance; six lines have completed production-line conversion and are expected to go through national acceptance by the end of December 2021; two lines are in the process of production-line conversion and are expected to complete the conversion by December 2021; two lines have completed the design and procurement contracts; and one additional line that has completed the design and procurement milestone needs to relocate the workshop, which will delay completion of the conversion to December 2021. Table 1 shows the progress in the conversion of manufacturing lines so far.

Table 1. Progress in the conversion of manufacturing lines under the first, second and third tranches

No.	Name of enterprise	Phase-out HCFC-22 (mt)	No. of lines	Type of products	Alternative technology	Funding (US \$)	Milestones achieved
1-1	Yantai Moon	590.23	1	Water chiller	R-290	9,319,613	Operationally and

¹⁸ As per the letter of 23 August 2021 from the Ministry of Ecology and Environment of China to UNDP.

¹⁹ 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).

No.	Name of enterprise	Phase-out HCFC-22 (mt)	No. of lines	Type of products	Alternative technology	Funding (US \$)	Milestones achieved
				(heat pump)			financially completed
1-2	Dunham-Bush	20.42	1	Heat pump water heater	HFC-32	282,762	National project acceptance in November 2019
1-3	Nanjing TICA	91.58	1	Freezers, refrigeration and condensing units	NH ₃ / CO ₂	968,400	Workshop relocation, completion delayed to the end of 2021
1-4	Nanjing TICA	32.52	1	Heat pump water heater	CO ₂	547,038	Completed production line conversion; project acceptance is expected by December 2021
1-5	TCL Zhong Shan	115.31	1	Unitary air-conditioning	HFC-32	1,020,456	Completed production line conversion; project acceptance is expected by December 2021
1-6	Guangdong Jirong	21.13	1	Unitary air-conditioning	HFC-32	292,769	National project acceptance in October 2019
Total - 1st tranche		871.19	6			12,431,038	
2-1	Yantai Aowei	108.07	1	Freezers, refrigeration and condensing units	NH ₃ / CO ₂	1,561,153	National project acceptance in October 2020
2-2	Yantai Aowei	75.28	1	Freezers, refrigeration and condensing units	NH ₃ / CO ₂	1,168,935	National project acceptance in October 2020
2-3	Zhejiang Guoxiang	42.18	1	Unitary air-conditioning	HFC-32	504,288	National project acceptance in September 2019
2-4	Haixin Shandong	85.26	1	Unitary air-conditioning	HFC-32	819,134	Completed production line conversion; project acceptance is expected by December 2021
2-5	Haixin Shandong	105.31	1	Unitary air-conditioning	HFC-32	953,449	Completed production line conversion; project acceptance is expected by December 2021
2-6	Qingdao Haier	492.00	1	Unitary air-conditioning	HFC-32	3,265,986	Completed production line conversion; project acceptance is expected by December 2021
2-7	Dunham-Bush	112.20	1	Water chiller (heat pump)	R-513A	1,610,512	National project acceptance in October 2020
2-8	Dunan Environment	147.34	1	Water chiller (heat pump)	R-513A	2,030,774	Design and procurement contract completed; project acceptance is expected in November 2021
2-9	Zhejiang Guoxiang	95.22	1	Water chiller (heat pump)	R-513A	1,407,457	Design and procurement contract completed; project acceptance is

No.	Name of enterprise	Phase-out HCFC-22 (mt)	No. of lines	Type of products	Alternative technology	Funding (US \$)	Milestones achieved
							expected by December 2021
2-10	Dalian Refrigeration	237.04	1	Water chiller (heat pump)	R-290	3,373,561	Production line conversion is expected to be completed by December 2021
2-11	Shandong Shenzhou	114.09	1	Freezers, refrigeration and condensing units	NH ₃ / CO ₂	1,633,116	Completed production line conversion; project acceptance is expected by December 2021
Total - 2nd tranche		1,613.99	11			18,328,365	
3-1	Dalian Refrigeration	72.24	1	Water chiller (heat pump)	R-290	1,231,414	Production line conversion is expected to be completed by December 2021

Technical assistance (TA) activities

92. The following TA and awareness-raising activities were implemented:

- (a) The China Refrigeration and Air-conditioning Industrial Association (CRAA) continue assisting with project application and verification; monitoring the progress of conversions; coordinating seminars and awareness-raising activities; and tracking alternative technology development, assessing emerging alternatives in the ICR sector and providing advice to enterprises on technology selection. This TA will be continuously implemented throughout stage II;
- (b) Signature of two contracts by FECO with Daxin Certified Public Accountant (DCPA) in July 2017, to conduct verification of the baseline consumption and eligibility of the manufacturing lines to be converted, and to conduct verification of performance milestones during the conversion process. This TA will be continuously implemented throughout stage II;
- (c) The evaluation of CO₂ refrigeration systems in supermarkets was completed, where three refrigeration systems based on CO₂, HCFC-22 and R-404A were compared, the advantages of the CO₂ system in supermarkets were highlighted and an evaluation method for refrigeration systems in supermarkets was proposed;
- (d) The study on energy conservation in small and medium-sized cold-storage and compression-condensing units was completed, where a technical support document for the limits linked to energy-efficiency ratings was formulated and a national standard for energy conservation in cold storage and condensing units was drafted; and
- (e) The study on the safety requirements and evaluation methodology for using flammable refrigerants in industrial refrigeration and air-conditioning equipment was completed, where the safety requirements and inspection specifications for three typical products (unitary air conditioner, heat pump and water heater) were formulated.

93. TA activities funded by the Government of China included workshops to promote low-GWP technologies during the ICR equipment exhibition in Chongqing and Shanghai; a seminar (organized by

FECO) for the implementation of the sector plan in June 2021; a forum to introduce low-carbon alternative technologies and products in the refrigeration industry in July 2021.

Verification of the converted lines

94. In line with paragraph 5(c) of the revised Agreement between the Government of China and the Executive Committee, UNDP commissioned independent verification of two manufacturing lines using 610.65 mt of HCFC-22, out of the seven manufacturing lines, consuming 969.51 mt of HCFC-22, that were converted to alternatives under the first and second tranches. This represents more than 10 per cent of the consumption phased out. The verification confirms that both lines have been converted to alternative technologies and stopped using HCFC-22 in production, and the equipment using HCFCs was dismantled and destroyed.

Gender policy implementation

95. The implementation of the extended stage II of the ICR sector plan will continue to take into account gender mainstreaming and equity to the extent possible to encourage full engagement of women in various steps including planning, policy and decision making, consultations and advisory, and monitoring and evaluation. Women will be encouraged to participate in all 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 women instructors/trainers to deliver training, and to encourage female technicians and students to join the training workshops. Gender-disaggregated data will continue to be collected, where possible, for activities implemented under the sector plan for reporting.

Project implementation and monitoring unit (PMU)

96. FECO's roles and responsibilities for the overall implementation of the ICR sector plan include, *inter alia*, identification of new lines for conversion, managing contracts for the conversion of manufacturing lines and monitoring the progress of conversions; organizing meetings with stakeholders to discuss issues in implementation; developing terms of reference for TA activities; implementing awareness-raising activities to assist in the implementation of the ICR sector plan; and coordinating with UNDP to prepare reports for the Executive Committee.

Level of fund disbursement

97. As of August 2021, of the US \$35,464,531 approved so far, 97 per cent had been transferred from UNDP to FECO, and US \$26,245,495 had been disbursed to final beneficiary enterprises and for TA activities, accounting for 74 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 August 2021 (US \$)

ICR sector plan		First tranche (2016)	Second tranche (2017)	Third tranche (2020)	Total
Funds approved		13,368,756	20,000,000	2,095,775	35,464,531
Disbursement from UNDP to FECO*	Amount (US \$)	13,368,756	20,000,000	998,148	34,366,904
	Ratio (%)	100	100	48	97
Disbursement from FECO to beneficiaries	Amount (US \$)	12,394,660	13,113,783	737,052	26,245,495
	Ratio (%)	93	66	35	74

* The interest accrued from the funds held by FECO of US \$103,708 in 2015, US \$97,468 in 2016, US \$7,299 in 2017, and US \$86,874 in 2018 and 2019 was deducted from the approved funds before transfer.

Implementation plan for the fourth tranche

98. The fourth tranche will be implemented between 2021 and 2023. During the fourth tranche, established policy measures and ODS regulations will continue to be enforced. Eleven enterprises submitted letters of intent to convert 14 manufacturing lines that manufacture freezers and refrigeration condensing units, with an estimated consumption of 1,492.28 mt of HCFC-22; six of these are small and medium-sized enterprises (SMEs), with annual consumption of less than 50 mt, as shown in Table 3. The cost for conversion has been estimated at US \$17,000,000. Verification of actual consumption and manufacturing capacity has been conducted for five manufacturing lines; the remaining lines will be verified during implementation of the fourth tranche. Of these lines, six will be included in the fourth tranche and the remaining eight lines will be included in the subsequent tranches.

Table 3. Conversion of manufacturing lines to be implemented in the fourth tranche and in stage II extension

Enterprise	Phase-out (mt)	Applications	Alternative technology
Tianjin Fashihao	49.58	Freezers, refrigeration and condensing units	NH ₃
Jinan Oufeite	188.41	Freezers, refrigeration and condensing units	NH ₃ /CO ₂
Jinan Oufeite	116.97	Freezers, refrigeration and condensing units	NH ₃ /CO ₂
Jinan Dasen	176.06	Freezers, refrigeration and condensing units	NH ₃ /CO ₂
Jinan Dasen	37.61	Freezers, refrigeration and condensing units	NH ₃ /CO ₂
Yantai Ousenna	70.00	Freezers, refrigeration and condensing units	NH ₃ /CO ₂
Liaoning Gaoxiang	48.90	Freezers, refrigeration and condensing units	HFC-134a/CO ₂
Shenyang Anjie	47.90	Freezers, refrigeration and condensing units	HFC-134a/CO ₂
Hunan Nanfang	46.34	Freezers, refrigeration and condensing units	HFC-134a/CO ₂
Shanghai Laiao	48.90	Freezers, refrigeration and condensing units	CO ₂ /HFC-134a/HFC-32
Qingdao Haier	120.00	Unitary air-conditioning	HFC-32
TCL Zhongshan	140.00	Unitary air-conditioning	HFC-32
Yantai Moon	200.00	Freezers, refrigeration and condensing units	NH ₃ /CO ₂
Yantai Moon	200.00	Freezers, refrigeration and condensing units	NH ₃ /CO ₂

99. Policy measures and technical assistance activities are also planned under the fourth tranche to support the conversion of manufacturing capacity. The planned activities and budget are shown in Table 4.

Table 4: Activities and cost of the fourth tranche of the ICR sector plan

Description	Cost (US \$)
Manufacturing conversion	7,925,000
Technical assistance activities	
Strengthening policy measures to facilitate HCFC phase-out: Prepare a ban on use of HCFC-22 in multi-split air-conditioning sub-sector	50,000
Conducting a risk assessment on the use of flammable refrigerants: Research and propose further optimization measures in structural design to improve safety of various air-conditioning applications to support the conversions of SMEs	180,000
Establishing standards to support the conversion to low-GWP alternatives: Review existing standards for the adoption of HFC-32 and CO ₂ in heat pumps and water heaters; CO ₂ /NH ₃ systems in commercial refrigeration; and HFOs in large/medium-sized chillers	50,000
Promoting market penetration of low-GWP alternatives: Display units based on low-GWP technologies; disseminate information on policies, research outcomes, and alternative technology evolution; conduct promotional activities at the exhibition; training for enterprises to improve knowledge on the availability, accessibility, and safety of alternative refrigerants; share the outcomes and experience of the completed projects; and support enterprises to explore overseas markets	140,000
Supporting CRAA to assist in implementing the sector plan: Review documents submitted by beneficiaries, provide technical advice to enterprises on alternative technology, provide assistance in developing project proposals, report progress to FECO, and facilitate project verifications	180,000
Project management	475,000
Total	9,000,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

100. The consumption of HCFCs in the ICR sector in 2020 was 28,575 mt (1,554 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 5.

Table 5. Reduction in HCFC consumption in the ICR sector

	2016	2017	2018	2019	2020
ODP tonnes					
Maximum allowable consumption	2,162.50	2,162.50	2,042.40	2,042.40	1,609.90
Actual consumption in the ICR sector*	2,082.09	2,081.23	1,997.00	1,996.91	1,554.43
Reduction targets set in the HPMP	0.00	0.00	120.10	0.00	432.50
mt					
Maximum allowable consumption	39,320.00	39,320.00	37,135.00	37,135.00	29,602.73
Actual consumption in the ICR sector*	38,254.70	38,234.00	36,643.00	36,643.00	28,575.00
Reduction targets set in the HPMP	0.00	0.00	2,185.00	0.00	7,532.27

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

101. HCFC consumption in the ICR sector has been decreasing due to the implementation of the activities in the ICR sector phase-out plan, which has resulted in continuous sales of ICR equipment manufactured by the lines converted in stage I and II of the HPMP.

Technical issues

102. The Secretariat noted that the conversion of seven manufacturing lines has been completed and enquired about the status of production with alternative technologies and barriers for market adoption. UNDP reported that so far Yantai Moon has produced 213 units of water chillers using R-290 refrigerant and Yantai Aowei has produced 26 units of freezers and refrigeration and condensing units with NH₃/CO₂ technology. The lines converted to HFC-32 and R-513A technologies have started production with alternatives; however, sales were limited due to the impact of the COVID-19 pandemic. For HFC-32-based products, the market acceptance is low due to the flammability of HFC-32; for R-513A-based products, the sales are limited due to the high price and high operation and maintenance costs. In order to remove the barriers to market adoption of products with alternative technologies, the enterprises developed communication strategies including awareness on safety measures and are actively communicating with customers. The Government and industry associations are supporting the enterprises by publishing the recommended directory of key alternative technologies to HCFCs to raise awareness.

103. Noting that a large share of the consumption will be phased out without funding support from the Multilateral Fund, the Secretariat enquired about the alternative technologies adopted in general in those enterprises for which phase-out was not funded. UNDP reported that R-410A and HFC-32 are mainly used as alternatives in the subsectors of unitary air-conditioning, heat pump water heater, small and medium-sized industrial and commercial chiller (heat pump) packages, and multi-split air-conditioning units; HFC-134a is used in medium- to large-sized water chiller units; and R-507, R-404A, HFC-134a and NH₃/CO₂ technologies are used in freezer and cold storage equipment and condensing units.

Completion of stage I of the ICR sector plan

104. Upon an enquiry on the disbursement of incremental operating cost (IOC) and on production with alternative technologies on the converted lines in stage I, UNDP reported that all disbursement of IOC is based on the products manufactured and sold. Latest disbursement information is not available as independent verification of production output is still ongoing. Production data in the first half-year as of June 2021 indicated that US \$8.79 million (70 per cent) of the committed IOC had been disbursed, with a balance of US \$3.74 million mainly related to the lines converted to HFC-32. All the lines are producing with alternatives selected and there are no deviations to other alternatives. UNDP informed that the actual levels of disbursement of IOC will be available upon financial completion in the first quarter of 2022.

Reporting of expenditures of the PMU

105. UNDP, as the lead agency for the overall 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 6.

Table 6. PMU cumulative expenditures for stage II of the ICR sector plan from 2017 to 2020

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	757,298
	Domestic travel	110,004
	International travel	4,000
	Domestic meetings	51,962
	International meetings	0
	Consulting service	75,514
Sub-total for sector-specific costs		998,778
Operational costs	Shared costs (support staff, office operation and maintenance)	969,182
Total disbursement*		1,967,960

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

Conclusion

106. The Secretariat notes that implementation of the third tranche of the ICR sector plan has been progressing. Conversions of seven manufacturing lines have been completed and 969.51 mt of HCFC-22 had been eliminated and replaced with low/zero-GWP (773.58 mt), HFC-32 (83.73 mt) and R-513A (112.20 mt) technologies. The conversion of the remaining manufacturing capacity with contract signed is progressing: six projects have completed production-line conversion and are expected to go through national acceptance by the end of December 2021; and two projects are in the process of production-line conversion and are expected to complete the conversion by December 2021. Several TA activities have been implemented, including technology studies, the development of technical guidelines for meeting safety regulations, and the revision of standards to assist in the conversion of manufacturing capacity and support market adoption of the alternative technologies. In view of the progress made and the overall funding disbursement of 74 per cent, the Secretariat recommends approval of the fourth tranche.

RECOMMENDATION

107. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the third 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 fourth tranche of the ICR sector plan of stage II of the HPMP for China, and the corresponding 2021-2023 tranche implementation plan, in the amount of US \$9,000,000, plus agency support costs of US \$630,000 for UNDP; and
- (c) Requesting the Government of China and UNDP to submit a report on disbursement of incremental operating cost in stage I of the ICR sector plan to the 90th meeting.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

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

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	10,682.65 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)					Year: 2020	
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,265.00	3,135.00	2,939.77		7,339.77
HCFC-123			10.20	7.16		17.36
HCFC-124				-0.51		-0.51
HCFC-141b		2,879.41			308.00	3,187.41
HCFC-142b		97.50	4.23	37.98		139.71

(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) BUSINESS PLAN		2021	2022	2023	Total
UNIDO	ODS phase-out (ODP tonnes)	169.39	0.0	257.15	426.54
	Funding (US \$)	4,440,500	0	6,741,000	11,181,500
Austria	ODS phase-out (ODP tonnes)	14.29	0.00	28.57	42.86
	Funding (US \$)	391,833	0	783,667	1,175,500
Italy	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			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	
Agreed funding (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	
	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	
	Italy	Project costs	891,892	0	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	0	108,108
Funds approved by ExCom (US \$)		Project costs	15,562,981	0	16,000,000	0	0		0	0	0	0	0	31,562,981	
		Support costs	1,135,084	0	1,040,000	0	0		0	0	0	0	0	0	2,175,084
Total funds requested for approval at this meeting (US \$)		Project costs						4,500,000						4,500,000	
		Support costs						332,333							332,333

* 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:	For individual consideration
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PROJECT DESCRIPTION

108. On behalf of the Government of China, UNIDO as the lead implementing agency has submitted a request for funding for the third tranche of stage II of the room air-conditioning (RAC)²⁰ manufacturing and heat pump water heaters (HPWHs) sector plan (RAC sector plan) of the HCFC phase-out management plan (HPMP) for China, at a total cost of US \$4,832,333, consisting of US \$4,150,000, plus agency support costs of US \$290,500 for UNIDO and US \$350,000, plus agency support costs of US \$41,833 for the Government of Austria.²¹ The submission includes a progress report on the implementation of the second tranche of the RAC sector plan, the tranche implementation plan for 2021 to 2023 and, verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee.

Adjustment to stage II of the RAC sector plan

109. At the 84th meeting, the Executive Committee adjusted stage II of the HPMP for China and requested bilateral and implementing agencies *inter alia* to submit revised plans of action for each sector plan (decision 84/69). At the 86th meeting the Executive Committee approved the revised extended plan of action for the RAC manufacturing and HPWH sector at a total amount of US \$28,831,100, plus agency support costs, for the period 2021-2026; the adjusted total funding approved in principle for stage II of the RAC sector plan is US \$60,394,081, plus agency support costs (decision 86/36).

110. Stage II of the RAC sector plan comprises an investment component to assist enterprises with conversions, regulatory actions and technical assistance to facilitate the market uptake of R-290 RAC technology, and project management. The original plan was to be implemented between 2016 and 2021, and included the conversion of twenty RAC, three residential HPWH, and three compressor manufacturing lines to R-290, and two residential HPWH manufacturing lines to R-744 to phase out 449 ODP tonnes of HCFC-22; an additional 578 mt of HCFC-22 would be phased out by non-assisted enterprises. The revised plan was extended to 2026, and the number of RAC manufacturing lines to be converted to R-290 under stage II was reduced to ten; the number of compressor manufacturing lines to be converted to R-290 increased to four; the number of residential HPWH lines to be converted to R-290 remained constant; and no residential HPWH manufacturing lines would be converted to R-744, to phase out 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 second tranche

Enterprise-level activities

111. Five RAC manufacturing and four compressor manufacturing enterprises shown in Table 1 had signed agreements to convert their manufacturing lines to R-290 technologies, and are at various stages of implementation as described below:

- (a) Two RAC manufacturing enterprises (TCL Zhongshan and Zhongshan Changhong) and one compressor manufacturer (Shenyang Sanyo) had completed their conversion;
- (b) Contracts for three enterprises (TCL Wuhan, Shanghai Highly, and GMCC) have been signed and equipment has been delivered;
- (c) Bidding on equipment and contracts for all other enterprises have been signed, with equipment expected to be delivered by December 2021; and

²⁰ In contrast to other documents, "RAC" in the present document refers to room air-conditioning and not refrigeration and air-conditioning.

²¹ As per the letter of 23 August 2021 from the Ministry of Ecology and Environment of China to UNIDO.

- (d) Incremental operating costs (IOCs) amounting to US \$13,992,300 were allocated to beneficiary enterprises; no disbursements against those IOCs have yet been made.

Table 1. RAC and compressor enterprises to be converted in the first two tranches

Enterprise name	Production (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	344,376
TCL Wuhan	849,042	829.59	1,352,355	405,707
TCL Zhongshan	925,867	875.87	1,352,355	1,352,355
Yangzi Chuzhou	294,454	322.11	1,340,805	402,242
Total	2,295,112	2,221.12	6,545,790	3,857,035
Compressor enterprises				
GMCC*	1,384,268	-	**861,490	258,447
Shanghai Highly	891,288	-	924,479	277,344
Shenyang Sanyo**	1,465,635	-	***969,136	969,136
Xi'an Qing'an	1,682,250	-	1,744,895	523,469
Total	5,423,441	-	4,500,000	2,028,396

* ICC = incremental capital cost

** 40 per cent non-Article 5 ownership, which is reflected in the ICCs.

*** 36 per cent non-Article 5 ownership, which is reflected in the ICCs.

112. An additional six RAC manufacturing enterprises and one HPWH manufacturing enterprise, with an aggregated consumption of 963.1 mt of HCFC-22, have expressed interest in converting their manufacturing lines to R-290 and were preparing proposals.

Verification of converted manufacturing lines

113. The verifications²² confirmed that the two RAC manufacturers, TCL Zhongshan and Zhongshan Changhong, completed manufacturing line conversions from HCFC-22 technology 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 the original manufacturing capacity, and that the baseline equipment was destroyed. Funding allocation for the two projects was found to be transparent, with funds disbursed cost-effectively and in line with FECO's allocation guidelines.

Technical assistance (TA) activities

114. Of thirteen research and development (R&D) projects for the introduction of the R-290 technology, with an associated budget of US \$3,488,912,²³ eleven contracts had been signed, and bidding for the remaining two concluded; disbursements against the signed contracts total US \$597,828; the projects are expected to be completed between 2022 and 2023.

115. The annual international workshop to promote R-290 in the RAC sector organized by the China Household Electric Appliances Association (CHEAA), was held in Ningbo in October 2020; it was attended by national consultants, local manufacturers, and international organizations, of whom over 150 participated in-person and others virtually. The October 2021 workshop will be held in Hefei. In addition, a workshop to promote alternative technologies, disseminate information on the HPMP, and present updates on the Kigali Amendment was organized in July 2021 for representatives from 12 local

²² The verification was conducted virtually due to the COVID-19 pandemic.

²³ At the 86th meeting, it was reported that the budget for the 13 R&D projects was US \$3,393,142. The increase in budget was due to the reformulation of two projects to focus on refrigerant charge reduction and improvement of year-round energy efficiency, in line with the new energy efficiency standard that came into effect in July 2021 that was based on an annual performance factor (APF).

environmental agencies and 10 RAC enterprises; and a virtual meeting was held with eight RAC and four compressor manufacturers to discuss the new energy efficiency standard China adopted in July 2021 that affects the manufacture of R-290-based RAC equipment, resulting in a proposal to revise the IOC incentive scheme.

116. Experts from CHEAA and RAC and compressor manufacturers continued to participate, both virtually and in-person, in meetings of the working group reviewing the International Electrotechnical Commission (IEC) standard 60335-2-40, which specifies requirements for the use of flammable refrigerants (and the maximum allowable charge of refrigerant). IEC members approved revisions to the standard contained in a draft for comment in November 2020; the IEC working group will next consider comments submitted by member countries and prepare the Final Draft International Standard, the approval of which would be voted on by IEC members at a future date, likely in 2022. The increased charge of flammable refrigerant that would be permitted under the revised IEC standard would allow higher capacity, higher energy-efficiency equipment to be manufactured. Once the review of the IEC 60335-2-40 standard is approved, the national GB4706.32 standard would be revised, accordingly.

Project implementation and monitoring unit (PMU)

117. Of the US \$1,644,556 allocated to the PMU under the first two tranches, US \$1,287,617 was disbursed for staff (US \$729,939), domestic travel (US \$49,125), domestic meetings (US \$24,897), consulting services (US \$34,190), and shared costs (US \$449,466) across the six other sectors in the HPMP and the production sector.

Level of fund disbursement

118. As of July 2021, of the total US \$31,562,981 approved for UNIDO and Italy, US \$9,111,327 (29 per cent) has been transferred to FECO and US \$7,074,026 (22 per cent) has been disbursed from FECO to the final beneficiaries as shown in Table 2.

Table 2. Status of disbursements for the RAC sector plan as of July 2021

Particulars		Tranche 1	Tranche 2	Total
Funds approved (US \$)		15,562,981	16,000,000	31,562,981
Disbursement from UNIDO and Italy to FECO	Amount (US \$)	4,371,327	4,740,000	9,111,327
	Disbursement ratio (%)	28	30	29
Disbursement from FECO to beneficiaries*	Amount (US \$)	3,713,046	3,360,980	7,074,026
	Disbursement ratio (%)	24	21	22

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

Implementation plan for the third tranche

119. FECO will continue enforcing the quota permits to RAC enterprises consuming more than 100 mt of HCFCs per year, continue with the conversion of the six enterprises in Table 1 that had not yet completed their conversion, and select from the seven enterprises preparing proposals at least three additional RAC production lines and one HPWH line for conversion to R-290, resulting in an additional reduction of at least 261 mt of HCFC-22.

120. The following TA will be implemented: verifications of baseline information (i.e., non-Article 5 ownership, baseline equipment, HCFC consumption, and financial data) of manufacturing lines prior to signature of contracts for conversion; development of a catalogue of recommended alternative technologies;²⁴ participation in meetings related to the revision of the IEC 60335-2-40 and revision to

²⁴ The catalogue will address technologies for all sectors; at this time, the only technology recommended for RAC will be R-290. Inclusion of recommended technology will provide guidance to and have influence on Government procurement.

the GB4706.32 standard; promotion of R-290 RAC split units through a pilot installation of 10,000 R-290 RAC units in an apartment building,²⁵ and promotion of the 2017 ecolabel for R-290 RAC units.

121. CHEAA will continue to assist UNIDO and FECO in the day-to-day operational management of the HPMP, including providing policy recommendations and market analysis; reviewing information provided by beneficiaries; supporting, as required, on-site verifications, project reviews, implementation, and commissioning; and providing other assistance as related to the HCFC phase-out in the RAC sector.

122. In addition, in cooperating with the Government of Austria, a “Clean Cooling Hub” to identify and remove barriers to the global uptake of R-290 in RAC, will be implemented and will include:

- (a) Capacity-building for stakeholders from the private and public sector, including development of an online platform and e-tools for training; showcase of alternative technologies in the training centre and on the online platform, allowing manufacturers to display R-290 products; expert advice on improving energy efficiency and reducing the climate impacts of RAC equipment;
- (b) Technician training and certification;
- (c) Development of guidelines for the storage of R-290-based equipment and training of distributors of equipment; and training and assistance on issues related to the transportation and storage of R-290-based RAC units; and
- (d) Assistance in policy development, including lessons learned from the European Union (EU) F-gas regulation, including strategies used in the HFC phase-down and technical background papers, and assistance to harmonize with EU and international standards.

123. Table 3 presents the budget of the activities to be implemented during the third tranche.

Table 3. Budget for the third tranche of the RAC sector plan

Activity	Budget (US \$)
Conversion of at least three RAC manufacturing lines and one HPWH line to R-290	3,246,000
TA activities <ul style="list-style-type: none"> • Verification (US \$150,000) • Participation in IEC standards meetings (US \$100,000) • China-Austria bilateral cooperation (US \$350,000) • Pilot installation (US \$300,000) • Promotion of eco-label (US \$30,000) • Support by CHEAA (US \$76,500) 	1,006,500
PMU <ul style="list-style-type: none"> • Project staff (US \$118,280) • Domestic travel (US \$14,182) • Domestic meetings (US \$6,608) • Consulting services (US \$7,623) • Operating costs – daily operating expenses, support staff, office facilities and equipment (US \$100,807) 	247,500
Total	4,500,000

²⁵ Each RAC unit will include a Wi-Fi module to enable operation monitoring and data collection; the 10,000 units in the pilot installation would not be included in the IOC incentive scheme.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

124. As further described in paragraph 9 of the present document, the consumption of HCFC-22 in the RAC sector in 2020 was 29,000 mt (1,595 ODP tonnes), which was lower than the maximum allowable consumption in the Agreement between the Government of China and the Executive Committee.

Technical issues

Clean Cooling Hub

125. Upon a request for clarification, UNIDO explained that the Clean Cooling Hub will be operational by December 2022 and will focus on R-290-based equipment with barriers for market introduction, including split air-conditioning (AC) units but possibly also other R-290 refrigeration and air-conditioning equipment; factory-sealed units (i.e., dehumidifiers, portable AC) would not be a focus. In addition to the assistance to China provided under the HPMP, the hub would also be available to other Article 5 countries that wished to avail themselves of its resources, where those services would be offered at discounted or zero costs through the support of the Government of Austria or, if so approved, under future HPMPs for those Article 5 countries; the hub will also offer services to non-Article 5 countries as a regular paid service outside the scope of the Multilateral Fund.

126. The capacity-building activities of the hub under the third tranche will include a combination of awareness-raising and training; technician certification would be based on certification schemes available in China and Austria, and the number of technicians to be trained and certified would be determined during implementation. Regarding the development of guidelines and trainings for distributors on the requirements for storage of R-290 products, UNIDO clarified that while installation of RAC split units had been identified as a key barrier to the uptake of the technology, the safe storage and transportation of R-290-based products were also challenges and, therefore, would be addressed. The assistance provided under the sector plan would focus on RAC equipment and the specific needs of R-290 RAC manufacturers and technicians, and would complement the activities being undertaken in the refrigeration servicing and national enabling programme.

127. The Secretariat also sought to better understand the assistance to be provided in policy development and standards, noting that while manufacturers in China might wish to export RAC equipment to the European market, the Government of China's policies and standards would depend on domestic circumstances. UNIDO emphasized that the intention was not to harmonize the Government's phase-down schedule with the EU F-gas regulation, but to share lessons learned from the European experience. The harmonization of standards would allow RAC manufacturers to sell RAC equipment both within and outside of China.

Conversions at enterprises without assistance from the Multilateral Fund

128. Recalling that 90 per cent of the phase-out under stage II (i.e., 40,514 mt) would be achieved through conversions at enterprises without assistance from the Multilateral Fund, the Secretariat asked whether any information was available on those conversions. While data on the technology selection of enterprises that converted without assistance from the Multilateral Fund had not been collected, UNIDO expected that those enterprises would have the capability to manufacture both HFC-32- and R-410A-based equipment, and some lines may be able to manufacture both HFC-32- and R-290-based RAC equipment. In addition, UNIDO understood that two RAC manufacturers were planning to convert a manufacturing line to R-290 using their own resources, which the Secretariat considers an encouraging sign of market

acceptance of the technology. FECO was developing an industrial database that will include information on HCFC production and consumption, and manufacturing enterprises from the RAC and other sectors that use HCFCs and HFCs. The database will include enterprises that participated in the HPMP; other HCFC- and HFC-related enterprises will be able to register and report data with the assistance of local ecology and environment bureaus and according to HCFC and HFCs management regulations. That database was expected to be operational by December 2021, and may provide additional insights in the technology selection of RAC manufacturers that converted without assistance from the Multilateral Fund.

Revision to the IOC incentive scheme

129. As noted in the progress report on stage I of the RAC sector plan (paragraphs 6 to 8 of the present document), the Government of China proposed to modify the IOC incentive scheme agreed at the 86th meeting in light of the new energy efficiency standard, based on an annual performance factor (APF) that went into effect in July 2021, and the continued limited sales of R-290 RAC units.²⁶ Following detailed discussions with UNIDO, a modified IOC incentive scheme described in Table 4 has been agreed to further encourage the uptake of R-290 RAC units and to promote energy-efficient equipment; equipment with fixed-speed compressors would not be eligible to receive IOCs. In line with past practice, IOCs under stage II would be disbursed based on verified sales that took place by the dates specified in Table 4.

Table 4. Agreed IOC incentive scheme (RMB*/unit)

Split units		HPMP stage I and II	HPMP stage II	HPMP stage II
		Until 31 December 2021**	1 January 2022 to 31 December 2022	1 January 2023 to 31 December 2023
Local sales	$5.00 \leq \text{APF}$	n/a	320	160
	$4.50 \leq \text{APF} < 5.00$	n/a	220	110
	$4.00 \leq \text{APF} < 4.50$	240	120	60
	$3.50 \leq \text{APF} < 4.00$	0	0	0
	$3.30 \leq \text{APF} < 3.50$	0	0	0
Export to Article 5 countries		120	80	40
Kits to Article 5 countries		80	60	30
Export to non-Article 5 countries		0	0	0

* RMB = Renminbi

** On an exceptional basis, and for stage I only, the level of IOCs indicated in Table 4 would be provided for RAC units manufactured by 31 December 2021 and sold by 31 August 2022.

130. The revised IOC incentive scheme would continue to use the first-come, first-served principle; would not limit the amount of IOC for any individual manufacturer; would continue to be provided only on the sale of split R-290 AC units to China and other Article 5 countries; and manufacturers that converted their lines to R-290 with their own resources would be eligible for IOCs for R-290 RAC split units manufactured on their converted lines, subject to the Article 5 ownership of those manufacturers.

Gender policy implementation

131. Stage II of the RAC sector plan, and the first and second tranches of that plan, were approved prior to decision 84/92(d).²⁷ The Government of China nonetheless was incorporating gender mainstreaming during the implementation of stage II to the extent possible, noting that no additional funding will be provided for gender mainstreaming and the limited funding available under stage II, including by fostering the engagement of women in planning, policy and decision-making, training and workshops, brainstorming

²⁶ As noted in paragraph 3 of the present document, and in line with decision 86/36(c), UNIDO reported the level of sales of RAC split units using R-290 at 260,711.

²⁷ Bilateral and implementing agencies were requested to apply the operational policy of the Multilateral Fund on gender mainstreaming throughout the project cycle.

and advisory services, and monitoring and evaluation.

Conclusion

132. China continues to be in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the RAC sector plan, including the reduction targets on HCFC consumption agreed for 2019 and 2020. Implementation of the first two tranches of stage II is progressing, resulting in the completion of three conversion projects, initiation of another six conversions to be completed between 2022 and 2023, and ongoing implementation of several TA activities. The level of disbursement is 21 per cent of the funds approved in the second tranche. Notwithstanding the activities being implemented and the efforts by the Government of China, the market uptake of R-290 RAC split units remains limited, with sales of that equipment continuing to account for an insignificant proportion of sales in the market. In light of the revised energy efficiency standard, it was agreed to revise the IOC incentive scheme to encourage the market uptake of energy-efficient, R-290 RAC split units. Continued and sustained efforts, including the implementation of the activities planned under the third tranche, will be required to ensure a sustained and substantial market uptake of R-290 RAC equipment in China. The uptake of R-290 RAC equipment in markets outside of China will similarly benefit from policies and regulations to encourage that transition.

RECOMMENDATION

133. The Executive Committee may wish:

- (a) To note the progress report on the implementation of the second 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; and
- (b) To approve the third tranche of the RAC sector plan of stage II of the HPMP for China, and the corresponding 2021-2023 tranche implementation plan, at the amount of US \$4,832,333, consisting of US \$4,150,000, plus agency support costs of US \$290,500 for UNIDO and US \$350,000, plus agency support costs of US \$41,833 for the Government of Austria.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

China

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

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	10,682.65(ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)					Year: 2020	
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,265.00	3,135.00	2,939.77		7,339.77
HCFC-123			10.20	7.16		17.36
HCFC-124				-0.51		-0.51
HCFC-141b		2,879.41			308.00	3187.41
HCFC-142b		97.50	4.23	37.98		139.71

(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) BUSINESS PLAN		2021	2022	2023	Total
UNDP	ODS phase-out (ODP tonnes)	44.51	17.80	35.61	97.92
	Funding (US \$)	2,675,000	1,070,000	2,140,000	5,885,000

(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
Agreed funding (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		0	0	0	0	0	19,545,909
		Support costs	197,536	264,403	0	906,275		0	0	0	0	0	0
Total funds requested for approval at this meeting (US \$)		Project costs					2,500,000						2,500,000
		Support costs					175,000						

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

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

Secretariat's recommendation:	For individual consideration
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PROJECT DESCRIPTION

134. On behalf of the Government of China, UNDP as the designated implementing agency, submitted a request for funding for the fourth tranche of the solvent sector plan of stage II of the HCFC phase-out management plan (HPMP), at the amount of US \$2,500,000, plus agency support costs of US \$175,000.²⁸ The submission included a progress report on the implementation of the third tranche, the tranche implementation plan for 2022-2023, and verification reports in line with paragraph 5(c) of the Agreement between the Government of China and the Executive Committee.

Adjustment to stage II of the solvent sector plan

135. At the 84th meeting, the Executive Committee adjusted stage II of the HPMP for China and requested bilateral and implementing agencies *inter alia* to submit revised plans of action for each sector plan (decision 84/69). At the 85th meeting, the Executive Committee approved the third tranche of the solvent sector plan at US \$12,946,782, plus agency support costs of US \$906,275 for UNDP (decision 85/33). At the 86th meeting the Executive Committee approved the revised plan of action for the solvent sector at a total amount of US \$6,023,431, plus agency support costs of US \$421,640, for the 2021-2026 period; the adjusted total funding approved in principle for stage II of the solvent sector plan is US \$25,569,340, plus agency support costs of US \$1,789,854 (decision 86/34).

136. The revised plan of action for 2021-2026 comprises the policy and regulatory interventions to ensure timely and sustainable phase-out of HCFCs; technical assistance (TA) to strengthen the technical capacity of the industry and to promote the adoption of low-global-warming potential (GWP) alternatives; and project management. It also includes investment activities to convert 18 small- and medium-sized enterprises (SMEs) in the disposable medical devices (DMD) sub-sector and seven SMEs in the electronic degreasing sub-sector, with a verified HCFC baseline consumption of 372.19 mt (40.94 ODP tonnes) of HCFC-141b. The total funding allocated for these enterprises is US \$2,014,421, at a cost-effectiveness level of US \$9.86/kg, which is lower than that in the sector plan as originally approved (US \$13.00/kg). All enterprises will be using low-GWP alternatives (e.g., KC-6, hydrocarbons or diluent, trans-1, 2-dichloroethylene and hydrofluoroether, water-based cleaning agent, modified alcohol, nano silicon carbonate, F-solvents, or naphthenic aromatics). Upon completion, stage II will phase out 455.2 ODP tonnes of HCFC-141b consumption in the solvent sector and will reduce greenhouse gas emissions of 2.98 million CO₂-equivalent tonnes.

Progress report on the implementation of the third tranche of stage II

137. The agreement for the implementation of stage II of the solvent sector plan, as approved at the 77th meeting between the Foreign Environmental Cooperation Center (FECO) and UNDP was signed in April 2017. The Agreement was subsequently amended to include the approved budget for the second tranche in April 2018, and the approved budget for the third tranche and associated implementation plan for 2020-2021 in August 2020.

Regulatory activities

138. FECO continued to implement quota permits to solvent enterprises consuming more than 100 metric tonnes (mt) of HCFCs per year. On 23 January 2018, the Ministry of Ecology and Environment (MEE) issued a circular on the Management of construction of facilities producing or using ODS. According to the circular, any new establishment, retrofitting or expanding facilities for production or use of HCFCs in application as refrigerants, foam blowing agents, solvents or chemical process agents is not permitted.

²⁸ As per the letter of 23 August 2021 from the Ministry of Ecology and Environment of China to UNDP.

139. The research to ban the use of HCFCs in the medical devices sub-sector initiated in June 2018, has been completed; the draft report was consulted with experts, enterprise representatives and other stakeholders. Due to the delay of project funding and funding adjustments, the remaining activities related to the assessment of the impact of this ban and the final revision of the report are expected to be completed by the end of 2021. The proposal for issuing the ban will be considered by the MEE in 2022, for eventual enforcement in 2023, if the final assessment demonstrates the effectiveness of its implementation.

Investment activities

140. As of February 2020, all 24 enterprises (comprising 514 production lines) identified as part of the previous tranches, had signed contracts with FECO; HCFC-141b consumption amounted to 1,176.22 mt (129.38 ODP tonnes), representing 28 per cent of the reduction target of 455.2 ODP tonnes for stage II of the solvent sector; and the total value of the conversion amounted to US \$20,040,546. Subsequent to the signing of the contracts, one beneficiary (Dechang Beihai) withdrew its participation in the HPMP (as the enterprise was closed), thereby reducing the total contract value to US \$18,193,762 but the overall phase-out of HCFC-141b remains unchanged. The US \$1,846,784, plus agency supports costs of US \$129,275, has been returned to the Fund.

141. As of July 2021, 11 enterprises completed final verification and received national acceptance for the project; eight enterprises completed installation of the equipment and trial production with ODS-free solvent, and are now preparing verification documents; one enterprise finished the installation of equipment and is preparing for trial production; three enterprises received and installed part of the equipment and awaiting delivery of the remaining equipment.

142. Contracts for the second set of 25 eligible enterprises (mostly SMEs, each with annual consumption of no more than 5 mt of HCFC-141b), with a verified consumption of 372.19 mt (40.94 ODP tonnes) of HCFC-141b, will be signed as part of the fourth tranche.

143. A summary of the progress in the implementation of the solvent sector plan is presented in Table 1.

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

Status of implementation	No. of enterprises	HCFC consumption (2016)*		Value of contracts (US \$)	Estimated date of conversion
		mt	ODP tonnes		
Enterprises that have signed contracts	24	1,176.22	129.38	20,040,546	
Equipment installed, completed verification, received national acceptance and started production	11	**502.14	55.24	9,358,708	June 2021
Equipment installed, completed trial production, pending verification	8	233.20	25.65	3,743,441	December 2021
Equipment installed, ready for trial production	1	19.37	2.13	309,888	December 2021
Installed partial equipment, pending delivery of remaining equipment	3	316.81	34.85	4,781,725	December 2022
Enterprise withdrawn	(1)	104.68	11.51	(1,846,784)	
Sub-total	23	1,176.22	129.38	18,193,762	
Enterprises with contracts to be signed	25	372.19	40.94	2,014,421	

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

** Actual phase-out achieved in these 11 enterprises was recorded at 711 mt (78.21 ODP tonnes).

Verification of converted manufacturing lines

144. In accordance with paragraph 5(c)²⁹ of the Agreement, UNDP commissioned the verification of three out of the 11 enterprises that had completed their conversions. The verification reports confirmed *inter alia* that the three enterprises had a total of 47 lines converted with a total phase-out of 147.91 mt³⁰ (representing 21 per cent of the total HCFC-141b so far phased out in stage II); two enterprises introduced hydrocarbon-based solvents, and one modified alcohol in cleaning systems for the metals and electronics sub-sector, in line with the relevant national product standards; the allocation of funds was transparent and within the cost-effectiveness thresholds; there was no capacity upgrade in the conversions and the replaced baseline equipment was destroyed as confirmed by a public notary and the audit office. The payment of incremental operating costs (IOCs) was made six months after the start of the trial run, once the enterprises had fully used the new cleaning systems.

TA activities

145. The following TA activities were implemented between 2020 and 2021:

- (a) Revision of the action plan for 2021-2026 based on the adjusted funding; consultation meetings to seek guidance from technical experts from the Beijing University of Chemical Technology and the industry association to update and revise the action plan to meet phase-out HCFCs committed in the solvent sector;
- (b) Continued technical support for ongoing investment activities, four enterprises tried out other alternatives including solvent-free technique (laser technique) and an HFO-based solvent, both suited for long-term use in accordance with the revised action plan; and
- (c) Completed HCFC phase-out performance verification through the Beijing Daxin Accounting Firm for 11 enterprises which have received national acceptance; verification of the remaining enterprises will be completed before the end of 2022.

Level of fund disbursement

146. As of August 2021, of the US \$19,545,909 approved so far, US \$16,895,452 had been disbursed by UNDP to FECO, and US \$13,143,311 by FECO to beneficiaries, as shown in Table 2. The balance of US \$2,650,457 will be disbursed in 2022.

Table 2. Status of disbursements for stage II of the solvent sector plan as of August 2021

Particulars		Tranche 1	Tranche 2	Tranche 3	Total
Funds approved (US \$)		*2,821,937	*3,777,190	12,946,782	19,545,909
Disbursement from UNDP to FECO	Amount (US \$)	2,796,937	3,741,089	10,357,426	16,895,452
	Disbursement ratio (%)	99	99	80	86
Disbursement from FECO to beneficiaries	Amount (US \$)	2,796,937	**3,742,190	6,604,184	13,143,311
	Disbursement ratio (%)	99	99	51	67

* A total of US \$60,000 from the first two tranches was retained by UNDP to cover activities to be implemented by UNDP.

** Total disbursement under the second tranche is US \$3,741,089 plus US \$1,101 (interest accrued up to December 2016 and offset from the transfer for the second tranche, in line with decision 80/17), for a total of US \$3,742,190.

²⁹ 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.

³⁰ UNDP based its verification ratio on the actual tonnage phased out from the 11 enterprises that had completed its conversion (445 production lines and 711 mt of HCFC phased out); the verification ratio of the three enterprises selected (47 lines and 147.91 mt of HCFCs phased out) is therefore 11 per cent based on the converted manufacturing lines, and 21 per cent based on consumption phase-out.

Implementation plan for the fourth tranche of stage II

147. The following activities will be implemented until December 2023:

- (a) *Policy actions:* FECO will continue to enforce the quota management in the solvent sector, local ecology and environment bureaus will improve their registration systems for HCFC consumers and sales; and Beijing University of Chemical and Technology (BUCT) will continue consultation for the finalization of the ban on the use of HCFCs in the medical devices sub-sector which is currently under review (ongoing activities);
- (b) *Enterprise level activities:* Continue the conversion of the remaining 12 enterprises of the first set to be completed by December 2022; performance verifications will be conducted for those enterprises who have completed conversions and are awaiting national acceptance. Funding from this tranche will be utilized for one remaining contract from the first set of enterprises, and the second set of 25 qualified beneficiary enterprises will sign new contracts, begin implementation, and disbursements will be given to enterprises after milestones stipulated in the conversion contracts are achieved (US \$1,942,500);
- (c) *TA activities:* FECO with the assistance of the implementation support agency (ISA), will continue to supervise/monitor the second batch of solvent enterprises, and provide technical support for the sector; organize workshops and meetings for relevant stakeholders to promote knowledge sharing and lessons learnt; and evaluate relevant regulations to support the phase-out in the sector (US \$420,000); and
- (d) *Project management:* Monitoring and verification, reporting and coordination, financial and operational management (US \$137,500).

Project management unit (PMU)

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

Table 3. PMU cumulative expenditures for stage II of the solvent sector plan in China

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	125,255
	Domestic travel	44,068
	International travel	0
	Domestic meetings	19,404
	International meetings	0
	Consulting service	29,858
Sub-total for sector-specific costs		218,585
Operational costs	Shared costs (support staff, computers, Internet, printing, office operation and maintenance)	374,357
Total disbursement (2017-2020)*		592,942

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

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

149. Consumption of HCFCs in the solvent sector in 2020 was estimated at 2,800 mt (308 ODP tonnes) which is lower than the maximum allowable consumption established in the Agreement between the Government of China and the Executive Committee as shown in Table 4.

Table 4. Consumption of HCFCs in the solvent sector

Solvent sector		2015	2016	2017	2018	2019	2020*
Consumption**	mt	3,815.40	3,787.98	3,638.40	3,438.00	3,539.10	2,800.00
	ODP tonnes	418.51	413.45	396.96	375.12	385.98	308.00
Maximum allowable consumption***	mt	4,172.00	4,172.00	4,172.00	3,624.5	3,624.5	2,944.91
	ODP tonnes	455.2	455.2	455.2	395.4	395.4	321.24
Phase-out targets	mt	n/a	n/a	n/a	548.2	n/a	679.60
	ODP tonnes	n/a	n/a	n/a	59.8	n/a	74.16

* Estimated consumption provided by FECO.

** As per the country programme implementation report.

*** As per the Agreement signed at the 67th meeting for stage I up to 2015, and as per the Agreement revised at the 86th meeting for stage II from 2016-2020.

150. The reduction in HCFC consumption in the solvent sector has been achieved through the application of the HCFC production quota and domestic sale quota issued for each producer; the application of the HCFC consumption quotas to manufacturing enterprises using more than 100 mt; and the conversion of enterprises in stage I of the HPMP with a total phase-out of 599 mt (65.90 ODP tonnes) of HCFC-141b. The slight increase in the estimated consumption in 2019 has been attributed to fluctuations in consumption of some enterprises which have not yet completed their conversions. The estimated consumption for 2020, which is 20 per cent lower than the 2019 consumption, reflects the progress in the implementation of the conversion projects in the solvent sector.

Status of progress

151. The Secretariat queried on the status of the signing of contracts for the second set of 25 enterprises that were initially included under the third tranche implementation. UNDP clarified that given the reduced funding for the solvent sector, and noting that the approval of the third tranche was required for the remaining financial commitments for the first set of 23 enterprises, the contracts for the second set of enterprises will only be signed as part of the fourth tranche. UNDP also emphasized that the funds provided to the second set of enterprises will be lower than originally allocated taking into account the overall funding adjustment of the sector. FECO continues monitoring these 25 enterprises to ensure their continuous participation in the project noting the reductions in the funding levels for complete conversions.

152. With regard to the one enterprise from the first set that terminated its contract with FECO due to economic difficulties, UNDP explained that the enterprise had returned the full funding allocated to FECO. UNDP further indicated that the returned funds will be adjusted within the project to account for the shortfall in the funding for the first 23 enterprises as a consequence of the revised Agreement, noting that the contract value allocated to the first batch of enterprises was US \$20,040,546, and that the amount apportioned for the investment activities from the last two tranches was only US \$17,866,791. It was indicated that the Government is fully committed to meeting their phase-out targets under this sector plan following the revised action plan approved at the 86th meeting.

PMU

153. In line with decision 83/61(b),³¹ UNDP had provided a breakdown of the budget for the PMU summarized in Table 5 below. The cost items indicated are consistent with the consolidated PMU report that had been submitted to the 84th meeting in line with decision 81/46(b).

Table 5. PMU budget for 2020-2022, stage II of the solvent sector plan in China

Item	Description	Cost (US \$)		
		2020	January-June 2021	Total
Sector-specific costs	Project staff	89,936	44,965	134,901
	Domestic travel	20,986	10,495	31,481
	International travel	0	0	0
	Domestic meeting	20,986	10,495	31,481
	International meetings	0	0	0
	Consulting service	20,986	10,495	31,481
Sub-total for sector-specific costs		152,894	76,450	229,344
Operational costs	Shared costs (support staff, computers, internet, printing, office operation, maintenance)	296,791	148,392	445,183
Total budget		449,685	224,842	674,527

Gender policy implementation

154. In line with the Multilateral Fund operational policy on gender mainstreaming (decision 84/92), the implementation of stage II of the solvent sector plan will continue to take into account gender mainstreaming activities. FECO in consultation with UNDP and the ISA will consider and develop relevant measures/requirements for the execution of gender policy where applicable. It may include, but not limited to, the encouragement of female participation of training. FECO will also gather and collect quantitative data in this regard, and will be based on further gender-related research and evaluations. Outreach and training materials will be developed to highlight gender issues and promote gender equity where applicable.

Conclusion

155. The Secretariat noted that the solvent sector plan is progressing with all 23 enterprises selected having signed their contracts with FECO, and demonstrating substantial progress in implementation, out of which 11 have already completed their conversion resulting in the phase-out of 78.21 ODP tonnes of HCFC-141b; the total phase-out from all 24 enterprises (including one that had withdrawn from the project) will amount to 129.38 ODP tonnes of HCFC-141b, representing 28 per cent of the HCFC reduction target for stage II of the solvent sector plan. The submission included the verification of the conversion of three solvent enterprises which converted to hydrocarbon and alcohol-based cleaning systems, confirming the phase-out of 147.91 mt (16.4 ODP tonnes) of HCFCs. The second set of 25 enterprises have been identified, have completed the verification with an estimated consumption of 372.19 mt (40.94 ODP tonnes) of HCFC-141b, and contracts will be signed as part of the fourth tranche. The disbursement rate of the funding so far approved is 67.24 per cent. In view of the implementation progress, the Secretariat recommends approval of the fourth tranche of the solvent sector plan.

³¹ To request bilateral and implementing agencies, when submitting tranche funding requests for HCFC phase-out management plans, to include: in the tranche implementation plan, the specific activities that would be implemented by the PMU, and the associated funding; and in the implementation report of the previous tranche, the activities implemented by the PMU and the associated funding disbursed.

RECOMMENDATION

156. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the third tranche of stage II of the solvent sector plan of stage II of the HCFC phase-out management plan (HPMP) for China; and
- (b) Approving the fourth tranche of the solvent sector plan of stage II of the HPMP for China, and the corresponding 2022-2023 tranche implementation plan, in the amount of US \$2,500,000, plus agency support costs of US \$175,000 for UNDP.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

CHINA

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

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2020	10,682.65 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)						Year: 2020
Chemical	Aerosol	Foam	Refrigeration		Solvent	Total sector consumption
			Manufacturing	Servicing		
HCFC-22		1,265.00	3,135.00	2,939.77		7,339.77
HCFC-123			10.20	7.16		17.36
HCFC-124				-0.51		-0.51
HCFC-141b		2,879.41			308.00	3187.41
HCFC-142b		97.50	4.23	37.98		139.71

(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) BUSINESS PLAN		2021	2022	2023	Total
UNEP	ODS phase-out (ODP tonnes)	30.03	46.08	51.77	127.88
	Funding (US \$)	1,287,291	1,975,325	2,219,467	5,482,083
Germany	ODS phase-out (ODP tonnes)	15.53	5.70	0.0	21.23
	Funding (US \$)	671,122	246,078	0	917,200
Japan	ODS phase-out (ODP tonnes)	6.21	0.0	0.0	6.21
	Funding (US \$)	271,200	0	0	271,200

(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	
Agreed funding (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	0	1,120,000
		Support costs	36,000	0	0	0	0	71,122	26,078	0	0	0	0	0	133,200
	Japan	Project costs	80,000	80,000	0	0	0	240,000	0	0	0	0	0	0	400,000
		Support costs	10,400	10,400	0	0	0	31,200	0	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	0	0	0	0	0	0	7,329,132	
		Support costs	411,051	0	294,461	120,000	0	0	0	0	0	0	0	825,512	
Total funds requested for approval at this meeting (US \$)		Project costs						2,000,000						2,000,000	
		Support costs						229,613						229,613	

* 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 maximum allowable total 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:	For individual consideration
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PROJECT DESCRIPTION

157. On behalf of the Government of China, UNEP as the lead implementing agency, has submitted to the 88th meeting a request for funding for the fourth tranche of the refrigeration servicing sector and enabling components of stage II of the HCFC phase-out management plan (HPMP), at a total cost of US \$2,229,613, consisting of US \$1,160,000, plus agency support costs of US \$127,291 for UNEP, US \$600,000, plus agency support costs of US \$71,122 for Germany and US \$240,000, plus agency support costs of US \$31,200 for Japan.³² The submission includes a progress report on the implementation of the third tranche of the refrigeration servicing sector and enabling components and the tranche implementation plan for 2022.

Adjustment to stage II of the refrigeration servicing sector and enabling components programme

158. At the 84th meeting, the Executive Committee adjusted stage II of the HPMP for China and requested bilateral and implementing agencies *inter alia* to submit revised plans of action for each sector plan (decision 84/69). The Executive Committee also approved US \$1,000,000, plus support costs of US \$120,000 for UNEP³³ to implement activities corresponding to the third tranche of the refrigeration servicing sector and enabling components.

159. At the 86th meeting, the Executive Committee approved the revised plan of action for the refrigeration servicing sector and enabling components for 2021-2026 at the adjusted funding of US \$12,717,105, plus agency support costs of US \$1,405,574. The total value of the refrigeration servicing and enabling components for stage II of the HPMP, as revised, amounts to US \$20,046,237, plus support costs of US \$2,233,086.

160. Stage II of the sector plan is comprised of a component related to phase-out activities in refrigeration servicing sector, and an enabling component to build capacity at the national and local levels, strengthen the communication and coordination mechanism of relevant departments associated with the HPMP implementation, ensure continuous implementation of policies and regulations on controlled substances, and increase monitoring and reporting of imports and exports of controlled substances, to reduce the risks of illegal ODS trade.

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

Progress report on the implementation of the third tranche of stage II

162. As of September 2021, the following activities were implemented:

- (a) The project cooperation agreement (PCA) for the third tranche between UNEP and the Foreign Environmental Cooperation Centre (FECO) was signed in May 2020, and funds were transferred from UNEP to FECO in June 2020;
- (b) Agreements and contracts were signed with 15 training centres for training on good refrigeration servicing practices; 4,637 trainers and technicians were trained as of June 2021; contracts were signed with selected manufacturers of air-conditioners and commercial refrigeration equipment as part of the after-sales servicing training programme resulting in 20,000 technicians trained; 37 technicians were trained in good service practices particularly ammonia-based systems in cold chain sub-sector, through the

³² As per the letter of 23 August 2021 from the Ministry of Ecology and Environment of China to UNEP.

³³ Decision 84/69(a)(vi)

Chinese Association of Refrigeration (CAR) which developed the training materials; a contract was signed in March 2021 with the China Refrigeration and Air-Conditioning Industry Association (CRAA) to develop the operational specifications for the detection and control of refrigerant leakage; data collection and recording of issues encountered during servicing and maintenance of the refrigeration equipment to address the technical requirements in servicing and maintenance;

- (c) The first draft of the code for the servicing and maintenance of heat pumps with focus on the refrigerant emissions, was finalized and currently under technical review; the technical standards and specifications for tools/equipment for training of refrigeration servicing technicians is under development;
- (d) Agreements with FECO in three of five pilot cities (Henan, Shandong and Shenzhen) as part of the pilot city component to build local capacity and establish policy frameworks to support the phase out of HCFCs, were signed in October 2020; data surveys to develop a database of technicians in these cities are being conducted to be part of the ODS Management Information System (MIS); activities to promote a pilot ODS recycling, a technician certificate system, and outreach of alternative technologies have been initiated as part of their agreement;
- (e) Commissioned three policy studies with the China Solid Waste and Chemical Management Centre for a market mechanism study on HCFC recovery in the refrigeration servicing sector, strengthening the filing management requirements (i.e., record keeping and documentation) for servicing, disposal, recovery, recycling or reuse of ODS; developing a certification system for handling recovered ODS refrigerants; and on the management of ODS disposal. Based on the results of these studies, a technical proposal for the management of ODS destruction in China will be developed; the first survey report on HCFC recovery and ODS disposal was submitted to FECO/MEE in July 2021; and
- (f) Awareness raising on the continued maintenance of the website “OzonAction in China,” in both Chinese and English with information on China’s implementation of the Montreal Protocol available for the general public; an outreach video was produced on China’s achievements in the implementation of the Montreal Protocol, focusing on supervision and law enforcement, building a long-term and sustainable compliance mechanism; one bilingual brochure on the progress in the implementation of the Vienna Convention and the Montreal Protocol was designed, printed and disseminated; various promotional materials were developed to support relevant outreach activities; and the International Ozone Day celebrations were organized.

163. To further support the capacity building and strengthening of the management of the import/export of ODS through the ODS Import and Export Management Office (I/E Office), new training material for customs officers were developed; 360 staff from the ODS import and export enterprises, 136 customs officers and 55 officials from local commercial departments were trained; and technical support was provided to local customs offices.

Level of fund disbursement

164. As of September 2021, of the US \$7,329,132 approved so far, US \$7,184,276 had been disbursed (US \$6,724,276 for UNEP, US \$300,000 for Germany, and US \$160,000 for Japan) as shown in Table 1. The balance of US \$144,856 will be disbursed from October 2021 to December 2022.

Table 1. Financial report of the refrigeration servicing sector and enabling programme (US \$)

Agency	First tranche		Second tranche		Third tranche		Total	
	Approved	Disbursed	Approved	Disbursed	Approved	Disbursed	Approved	Disbursed
UNEP	3,299,132	3,239,276	2,570,000	2,560,000	1,000,000	925,000	6,869,132	6,724,276
Germany	300,000	300,000	0	0	0	0	300,000	300,000
Japan	80,000	80,000	80,000	80,000	0	0	160,000	160,000
Total	3,679,132	3,619,276	2,650,000	2,640,000	1,000,000	925,000	7,329,132	7,184,276
Disbursement rate (%)	98.0		99.6		93.0		98.0	

Implementation plan for the fourth tranche of stage II

165. The following additional activities will be implemented in 2022:

- (a) Review of two codes for the servicing sector, in collaboration with the China Household Electrical Appliances Association (CHEAA): the technical requirements for installation, servicing and transportation of R-290-based refrigeration and air-conditioning equipment; and the safety requirements for the transport of room ACs using flammable refrigerants to reduce risks of refrigerant leakage during transportation (Germany) (US \$60,000);
- (b) Conduct outreach and training for 1,500 participants in the supermarket sub-sector to promote good refrigeration servicing practices, introduce alternative technologies, and provide training for technicians in this sub-sector (Germany) (US \$229,000);
- (c) Demonstration project for one beneficiary in the cold chain sector to collect data for a study to reduce consumption of HCFCs and promoting good servicing and maintenance practices including recycling/recovering refrigerant (UNEP/Japan) (US \$60,000);
- (d) Sign agreements with two additional pilot cities (Tianjin and Zhejiang) and initiate surveys of the servicing sector, develop a database of service technicians, promote good practices through training and outreach, and demonstrate refrigerant management including recycling and reuse for end-users (UNEP) (US \$200,000);
- (e) Train 400 technicians through 50 small and medium manufacturers' servicing employees for the ICR sector; update the after-sales training manual to focus on after-sales technicians, salespersons and other relevant staff to promote marketing and servicing of R-290-based refrigeration and air-conditioning equipment; and training of 1,000 technicians on good servicing practices including installation and handling of R-290 RAC equipment (UNEP/Japan) (US \$70,000) (Germany) (US \$260,000);
- (f) Strengthen the import and export management system by developing a long-term mechanism for cooperation with relevant management departments, and train 100 customs (both supervision departments and anti-smuggling departments), commercial departments and enterprises on matters related to the Montreal Protocol, import and export policies, national laws and regulations, efforts of customs in combating illegal trade in ODS, (UNEP) (US \$191,000);
- (g) Conduct a national survey, through the Ningbo Customs Anti-Smuggling Bureau, on ODS illegal trade and effectiveness of law enforcement to provide input for the development of an ODS intelligence collection system which will strengthen risk profiling on ODS trade (UNEP) (US \$135,000);

- (h) For the enabling components, continue capacity building of local authorities to enhance coordination and communication with relevant industrial associations, research institutions, experts and enterprises; organize four training workshops for ODS management and law enforcement officers from 31 ecology and environment bureaus (EEBs) to obtain experiences and skills on ODS enforcement at the provincial and city levels (UNEP) (US \$370,000);
- (i) Design and conduct awareness activities for the public including the International Day for the Preservation of the Ozone Layer, workshops on ODS management, exhibitions, and information materials; promote awareness on the preservation of the ozone layer; organize the Ozone2Climate Technologies Roadshow and Roundtable, and the International Workshop on the Alternatives to HCFC-22 in the Room Air-Conditioner Sector; and maintain and update the “OzonAction in China” website in both Chinese and English (UNEP) (US \$105,000) (Japan) (US \$150,000); and
- (j) Operate the working group of the refrigeration servicing sector of stage II of the HPMP, including coordination, implementation and monitoring of the activities for the servicing sector, capacity-building of national and local authorities, and awareness and outreach. FECO/MEE will continue the management and monitoring of the overall project implementation (PMU) (UNEP) (US \$119,000) (Germany) (US\$51,000).

SECRETARIAT’S COMMENTS AND RECOMMENDATION

COMMENTS

HCFC consumption

166. In 2020, the consumption of HCFCs in the servicing sector was 54,369.66 metric tonnes (mt) (2,984.4 ODP tonnes), as shown in Table 2.³⁴

Table 2. HCFC consumption in the servicing sector in China (2015-2020 country programme data)

HCFC	2016	2017	2018	2019	2020	Average*
Mt						
HCFC-22	47,398.35	51,482.65	59,821.81	58,005.55	53,450.32	64,466.58
HCFC-123	288.14	347.29	437.57	404.58	358.18	113.75
HCFC-124	67.16	(5.71)	(5.32)	37.71	(23.20)	139.56
HCFC-142b	371.44	662.43	276.97	909.55	584.36	5,338.58
Total (mt)	48,125.09	52,486.66	60,531.03	59,357.39	54,369.66	70,058.47
ODP tonnes						
HCFC-22	2,606.91	2,831.55	3,290.20	3,190.31	2,939.77	3,545.68
HCFC-123	5.76	6.95	8.75	8.09	7.16	2.30
HCFC-124	1.48	(0.13)	(0.12)	0.75	(0.51)	3.05
HCFC-142b	24.14	43.06	18.00	59.12	37.98	347.03
Total (ODP tonnes)	2,638.29	2,881.42	3,316.83	3,258.27	2,984.40	3,898.06

* Average consumption in 2009 and 2010.

167. The increased awareness of servicing technicians, improved technical knowledge and skills both for the installation and servicing, which had resulted in a reduction on equipment failure rate, reduced leakage rate and reduced refrigerant recharge, increased refrigerant recovery and reuse rate had contributed to the decrease in the overall HCFC consumption and, particularly, HCFC-22.

³⁴ There is no maximum allowable consumption of HCFCs specified in the refrigeration servicing sector in the Agreement between the Government of China and the Executive Committee.

168. Activities in the refrigeration servicing sector have also supported the conversion for the RAC and ICR manufacturing sectors resulting in a higher number of HCFC-free products entering the local market. The introduction of refrigeration and air-conditioning equipment based on HFC-32 and R-410A has increased³⁵ also contributing to the reduction of HCFC consumption.

169. The Government of China continues to enforce the strict license and quota management system for HCFC production and consumption, and it is committed to meet the phase-out target for stage II of the servicing sector and to support the phase-out in the RAC and the ICR manufacturing sectors. It is expected that the consumption of HCFC-22 for servicing will continue to decrease with further implementation of the activities in the RAC and ICR manufacturing sectors. The Government of China had also indicated that consumption of HCFC-22 for servicing RAC equipment was not affected by the pandemic.

Status of progress

170. The Secretariat queried on the status of the implementation of the activities in the work plan submitted to the 84th meeting (i.e., workshop for local commercial officers and ODS dealers to strengthen the import/export management system, two capacity building training workshops and technical assistance for EEBs, contracts with 10 additional regional training centres, revision of national certification programme) that were not reported. UNEP clarified that as a result of the funding adjustment for the refrigeration servicing sector plan agreed at the 84th meeting, the Government of China had to revise the original plan given priority to activities particularly related to the RAC and ICR sectors where efficient servicing of equipment is required to manage demand of refrigerant.

171. The Secretariat also queried on whether the results of the pilot ODS disposal project funded under the Multilateral Fund contributed to the study on barriers to recover and properly manage ODS wastes. UNEP explained that the experience gained from the completed pilot project will be taken into consideration and the data gathered from it will also be integrated into the barrier analysis, noting in particular that the business model developed must address how to make the ODS recovery and disposal sustainable, including to address difficulties in transportation and storage, in a cost-effective manner.

Gender policy implementation

172. In line with the Multilateral Fund operational policy on gender mainstreaming (decision 84/92), the implementation of stage II of the refrigeration servicing sector and enabling components will continue to take into account gender mainstreaming activities. Online training to identify indicators for mainstreaming gender into the implementation of various activities will continue to be undertaken as well as encouraging the participation of women in planning, policy and decision making, brainstorming and consultancy, monitoring and evaluation. Of the 5,212 participants in the training on good servicing practices, 648 trainees were female. Gender issues are also expected to be incorporated into thematic workshops to share experiences and lessons learned on gender mainstreaming. The Government of China will collect gender-disaggregated data of participants during workshops and meetings in the future.

Project implementation and monitoring unit (PMU)

173. In line with decision 81/46(b), UNDP as the lead implementing agency of stage II of the HPMP provided a cumulative report on PMU expenditures, as summarized in Table 3.

³⁵ UNEP indicated that, based on the survey for the preparation of stage II of the HPMP, the number of pieces of R-410A-based RAC equipment manufactured increased from 2010, and of R-32-based RAC equipment manufactured increased from 2016-2017. The pandemic has affected the market demand of RAC equipment, especially for exports.

Table 3. PMU cumulative expenditures for stage II of the refrigeration servicing and enabling programme

Item	Description	Cost (US \$)
Sector-specific costs	Project staff	125,255
	Domestic travel	41,815
	International travel	0
	Domestic meeting	19,468
	International meetings	0
	Consulting service	28,625
Sub-total for sector-specific costs		215,163
Operations costs	Shared costs (support staff, computers, Internet, printing, office operations and maintenance)	365,626
Total disbursements (2017-2020)		580,789

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

Conclusion

175. The Government of China continues to be in compliance with the Montreal Protocol and its Agreement with the Executive Committee with regard to the refrigeration servicing sector and enabling activities component; several activities are progressing well and disbursement is on track; consumption of HCFC in the sector for 2020 of 2,984.4 ODP tonnes confirms that the Government of China has met its commitment to reduce HCFC consumption for the servicing sector by 734 ODP tonnes in 2020 (i.e., from the 2015 consumption of 3,734 ODP tonnes, to the 2020 target consumption for servicing sector of 3,000 ODP tonnes). This reduction will be sustained through the enforcement of the quota management system for HCFC production and consumption, and the training programmes and technical assistance activities under the servicing sector under implementation. The overall disbursement rate is 83.15 per cent.

RECOMMENDATION

176. The Executive Committee may wish to consider:

- (a) Noting the progress report on the implementation of the third tranche of the servicing sector plan and the enabling programme of stage II of the HCFC phase-out management plan (HPMP) for China; and
- (b) Approving the fourth tranche of the servicing sector plan and the enabling programme of stage II of the HPMP for China, and the corresponding 2022 tranche implementation plan, in the amount of US \$2,229,613, consisting of US \$1,160,000, plus agency support costs of US \$127,291 for UNEP, US \$600,000, plus agency support costs of US \$71,122 for the Government of Germany and US \$240,000, plus agency support costs of US \$31,200 for the Government of Japan.

Annex I

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

Approval of stage II of the HPMP for China

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 and air-conditioning servicing sector and enabling programme component for the period 2016 to 2020, to reduce HCFC consumption by 734.0 ODP tonnes in that sector, in the amount of US \$20.29 million, plus agency support costs.

77th meeting

2. At its 77th meeting, the Executive Committee approved in principle stage II of the HCFC phase-out management plan (HPMP) for China for the period 2016 to 2026 in the amount of US \$500,100,000, plus agency support costs, to reduce HCFC consumption by 37.6 per cent of the baseline by 2020. Stage II included the following sector plans:
 - (a) The industrial and commercial refrigeration and air-conditioning (ICR) sector plan to reduce HCFC consumption in the sector by 33 per cent by 2020;
 - (b) The room air-conditioning manufacturing and heat pump water heaters (HPWH) (RAC) sector plan to reduce HCFC consumption in the sector by 45 per cent by 2020;
 - (c) The polyurethane rigid (PU) foam sector and the extruded polystyrene (XPS) foam sector plan to achieve the total phase-out of HCFCs in these sectors by 2026; and
 - (d) The solvent sector plan and the refrigeration and air conditioning servicing sector and enabling programme component, 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.

82nd meeting

4. 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 for the following tranches of stage II

of the HPMP, amounting to US \$29,199,492;³⁶ 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), the ICR (US \$12,000,000), and the solvent (US \$5,549,492) sector plans, and the refrigeration and air conditioning servicing sector and enabling programme (US \$3,850,000). The submission also included an independent verification of HCFC production and consumption in 2017 (submitted by the World Bank); annual implementation reports covering the activities undertaken so far, and annual implementation plans for the activities to be implemented in 2018-2019.

5. 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.

6. In discussing the tranche requests, several Committee members expressed serious concern at approving additional funding at that meeting given the unexplained emissions of CFC-11 that were reported in East Asia. Pursuant to decision XXX/3³⁷ more information had been requested on the cause of emissions of CFC-11 and it was suggested that the funding request be deferred until a subsequent meeting when more information was available. At the time, China still held over US \$100 million that had not yet been disbursed to beneficiary enterprises; 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 China.

7. 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 of the funds had already been transferred to the Government of China 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.

8. 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 ODS and implementation thereof in China; and

³⁶ 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.

³⁷ Unexpected emissions of CFC-11.

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

83rd meeting

9. In response to decision 82/71, UNDP submitted, on behalf of the Government of China, the report of the current monitoring, reporting, verification and enforcement systems and the progress report regarding actions taken with a view to strengthening of legislation on ODS.³⁸ 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 servicing sector plans and for second tranche of the PU foam sector plan associated with stage II of the HPMP for China.

10. After reviewing the re-submission of the sector plans and associated documents, the Secretariat concluded that all of them had merits to warrant their 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.

11. 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.

12. 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).

³⁸ UNEP/OzL.Pro/ExCom/83/11/Add.1

Annex II

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

Stage I - Cumulative expenditure (US \$) as of 31 December 2020

Item	Sectors*						
	Production	RAC	PU foam	XPS foam	ICR	Solvent	Servicing
Sector costs	11,056,665						
Project staff	1,768,942	1,626,383	1,590,980	1,199,717	1,641,291	235,859	260,452
Domestic travel	199,305	188,128	209,875	161,437	209,166	13,589	25,789
International travel	24,000	20,000	18,653	16,000	20,000	4,000	4,309
Domestic meeting**	176,004	144,869	170,391	130,008	166,551	12,000	20,382
International meetings	0	0	0	0	0	0	0
Consulting service***	159,479	146,564	167,581	128,880	164,628	10,874	20,579
Sub-total for sector costs	2,327,729	2,125,944	2,157,480	1,636,042	2,201,637	276,322	331,511
Share costs	12,395,055						
Supporting staff	6,539,906						
Computer, internet, post, phone, printing	1,588,319						
Office operation service and maintenance, utilities	4,266,830						
Total	4,889,411	4,355,932	4,749,869	3,622,688	4,736,682	450,982	646,156

Remarks: Total cumulative expenditure of the PMU from 2011 to 2020 for the implementation of stage I of the HPMP is US \$23,451,720. Of this amount, US \$18,948,018 came from the sector plans of stage I, US \$4,503,702 came from other individual projects or FEEO. In addition, the expenditures supported by IS and the co-financing of the Government of China (about US \$3.85 million from 2011 to 2020) are not included in the expenditure in the table above.

* 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.

*** Project evaluation, financial and technical verification, technical evaluation and review, bidding evaluation, assistance with high workload or special events, translation-related work.

Stage II - Cumulative expenditure (US \$) as of 31 December 2020

Item	Sectors*						
	Production	RAC	PU foam	XPS foam	ICR	Solvent	Servicing
Sector costs	5,131,806						
Project staff	943,737	729,939	769,536	580,211	757,298	125,255	125,255
Domestic travel	96,760	49,125	63,246	95,004	110,004	44,068	41,815
International travel	13,305	0	0	3,821	4,000	0	0
Domestic meeting**	42,319	24,897	33,261	44,876	51,962	19,404	19,468
International meetings	0	0	0	0	0	0	0
Consulting service***	65,484	34,190	44,354	65,215	75,514	29,858	28,625
Sub-total for sector costs	1,161,605	838,151	910,397	789,127	998,778	218,585	215,163
Share costs	4,405,371						
Supporting staff	2,633,285						
Computer, internet, post, phone, printing	555,330						
Office operation service and maintenance, utilities	1,216,756						
Total	1,980,766	1,287,617	1,500,955	1,626,148	1,967,960	592,942	580,789

Remarks: Total cumulative expenditure of the PMU from 2017 to 2020 for the implementation of stage II of the HPMP is US \$9,537,177. Of this amount, US \$4,117,850 came from the sector plans of stage II; the expenditure beyond the PMU received was advanced from FECO's own budget (US \$5,419,327) and will be reimbursed from future tranches. In addition, the expenditure from the IS and co-financing of the Government of China are not included in the table above.

* 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 other costs.

*** Project evaluation, financial and technical verification, technical evaluation and review, bidding evaluation, assistance with high workload or special events, translation-related work.