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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL

Eighty-sixth Meeting
Montreal, 2-6 November 2020
Postponed to 8-12 March 2021¹

Addendum

REPORTS ON PROJECTS WITH SPECIFIC REPORTING REQUIREMENTS

1. Due to the COVID-19 pandemic, the 85th meeting was postponed, and the Executive Committee agreed to establish an intersessional approval process (IAP) to consider certain reports and project proposals. The Executive Committee further agreed that the 86th meeting would address the remaining agenda items from the 85th meeting noting that documents for the 85th meeting related to recurring agenda items, including reports on projects with specific reporting requirements could be submitted to the 86th meeting. Therefore, the present document includes reports on projects with specific reporting requirements pertaining to China, that were submitted for individual consideration to the 85th meeting and deferred to the 86th meeting as agreed by the Executive Committee, and reports submitted to the 86th meeting.

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¹ Due to coronavirus disease (COVID-19)

Pre-session documents of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol are without prejudice to any decision that the Executive Committee might take following issuance of the document.

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PART I STAGE I OF THE HCFC PHASE-OUT MANAGEMENT PLAN

Overview of stage I including a summary of the status of implementation of the six sector plans

3. At its 64th meeting, the Executive Committee approved, in principle, stage I of the HCFC phase-out management plan (HPMP) for China for the period 2011 to 2015 at the amount of US \$265 million (excluding agency support costs), associated with the extruded polystyrene (XPS) foam, polyurethane (PU) foam, industrial and commercial refrigeration and air-conditioning (ICR), room air-conditioning manufacturing (RAC) and refrigeration servicing sector and national enabling programme, and the national co-ordination plan. The Committee also decided that the solvent sector, at a maximum level of funding of up to US \$5,000,000, (excluding support costs), could be considered at the 65th meeting (decision 64/49). With the approval of the solvent sector plan at the 65th meeting (decision 65/36), the overall funding for stage I of the HPMP for China amounted to US \$270,000,000.

4. The Agreement between the Government of China and the Executive Committee was updated several times and finalized at the 67th meeting, reflecting the newly established HCFC baseline for compliance in China, the change in responsibility of co-operating agencies, and the established agency support costs (decision 67/20).

5. To ensure compliance with the Montreal Protocol 2013 and 2015 HCFC consumption control targets in China, consumption targets were established for each of the six sector plans, as shown in Table 1.

Table 1. HCFC consumption limits and targeted phase-out amount in consumption sectors for stage I of the HPMP for China

National/sectoral level	2013 (ODP tonnes)		2015 (ODP tonnes)	
	Max. allowable consumption	Phase-out amount	Max. allowable consumption	Phase-out amount
National	18,865	n/a	16,979	n/a
Sector plans				
XPS	2,540	338	2,286	254
PU	5,392	673	4,450	942
ICR	2,403	224	2,163	240
RAC	4,109	176	3,698	411
Solvent	494	30	455	39
Servicing	n/a	61	n/a	0
Total	n/a	1,502	n/a	1,886

6. All tranches associated with the sector plans of stage I of the HPMP have been approved as listed in Table 2.

Table 2. Approvals of tranches for each sector plan of stage I of the HPMP for China

Sector plan	Meeting of the Executive Committee								
	64 th	65 th	68 th	69 th	71 st	72 nd	73 rd	74 th	75 th
XPS	First			Second	Third		Fourth		Fifth
PU	First		Second		Third		Fourth		Fifth
ICR	First		Second		Third		Fourth		Fifth
RAC	First		Second		Third		Fourth		Fifth
Solvent		First			Second				Third
Servicing	First		Second			Third		Fourth	Fifth

HCFC consumption

7. The Government of China has reported HCFC consumption for 2019 under Article 7 of the Montreal Protocol as shown in Table 3.

Table 3. HCFC consumption in China (2015 to 2019) (Article 7)

HCFC	2015	2016	2017	2018	2019	Starting point
Metric tonnes						
HCFC-22*	153,971	168,687	172,970	178,658	173,656*	209,006
HCFC-123	900	943	990	991	958	507
HCFC-124	(46)	67	(6)	5	38	140
HCFC-141b	38,584	39,144	40,039	38,057	38,449	53,502
HCFC-142b	11,616	9,471	10,253	5,367	6,500	22,624
HCFC-225ca/cb	15	38	38	38	0.57	17
Total	205,040	218,350	224,284	223,105	219,600	285,796
ODP tonnes						
HCFC-22*	8,468	9,278	9,513	9,826	9,551	11,495
HCFC-123	18	19	20	20	19	10
HCFC-124	(1)	1	(0.13)	0.12	0.83	3
HCFC-141b	4,244	4,306	4,404	4,186	4,229	5,885
HCFC-142b	755	616	666	349	422	1,471
HCFC-225ca/cb	1	1	1	1	0.017	1
Total	13,485	14,221	14,604	14,382	14,223	18,865

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

8. 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 2019 was marginally lower than in 2018. Despite economic fluctuations, China continues to be in compliance with the Montreal Protocol and with its Agreement with the Executive Committee for stage II of the HPMP (last consumption target in stage I was 2015).

9. The Government of China has reported country programme (CP) data for 2019. Table 4 presents HCFC consumption per sector which demonstrates compliance with the manufacturing sector consumption limits set out in its Agreement with the Executive Committee for stage II of the HPMP.²

Table 4. HCFC consumption per sector in China in 2019

Substance	XPS foam	PU foam	ICR	RAC	Solvent	Servicing	Aerosol	Total
HCFC-22	28,000		36,000	50,000		58,006	1,656	173,662
HCFC-141b		34,289			3,500		660	38,449
HCFC-142b	5,500		90			910		6,500
HCFC-123			553			405		958
HCFC-124						38		38
HCFC-225ca					1			1
Total (mt)	33,500	34,289	36,643	50,000	3,501	59,357	2,316	219,605
Total	1,898	3,772	1,997	2,750	385	3,258	164	14,223
Allowable***	2,032	3,775	2,042	2,876	395	n/a*	n/a**	15,048

* No annual consumption target established for the refrigeration servicing sector.

** Aerosol sector is not part of stage II of the HPMP.

*** Maximum allowable level of consumption.

10. The Government of China continued to monitor HCFC consumption in each of the different sectors. Each year for which a funding tranche is due, the Foreign Environmental Cooperation Centre (FECO) collects data from different sources including beneficiary enterprises, verification report of the production sector, the license system and industrial associations. Data is cross-verified with the actual consumption in the enterprises only for some sectors and substances, such as the RAC sector (with limited consuming enterprises) and HCFC-22. For sectors with large number of small and medium-sized enterprises (SMEs) (i.e., XPS foam, PU foam, ICR, and servicing sectors), consumption is monitored through the national

² Rows 1.3.1, 1.3.2, 1.3.3, 1.3.4 and 1.3.5 of Appendix 2-A of the Agreement.

system of licensing and quotas for HCFC imports, exports, production and consumption. The domestic production quotas control HCFC sold in the local market and subsequent consumption in SMEs. Quotas are also issued to enterprises with an annual consumption of HCFCs over 100 metric tonnes (mt), for each of the different sectors; enterprises with consumption smaller than 100 mt are not required to have a quota but are monitored by local Ecology and Environment Bureaus (EEBs).

11. In addition, FECO is cooperating with the local EEBs to strengthen policies that can support the reduction of HCFC consumption, including a ban for new HCFC-based manufacturing facilities.

Verification of consumption of HCFCs in China

12. The World Bank will undertake an independent verification of both the 2019 and 2020 HCFC production and consumption in China under stage II of the HPPMP in 2021, once both the World Bank's and China's travel restrictions related to the COVID-19 pandemic are lifted. The HCFC consumption per sector provided by the Government of China was within the limits established by the Agreement for the consumption sector.

Overview of progress³

13. An overview of the main achievements in the implementation of stage I of the HPMP include:
- (a) *XPS foam sector*: Sector plan operationally completed and project completion report (PCR) submitted at the 82nd meeting. All tranches were financially completed in June 2019;
 - (b) *PU foam sector*: Sector plan operationally completed (June 2019), PCR submitted at the 84th meeting, and fund balances returned at 84th meeting;
 - (c) *ICR sector*: Sector plan operationally completed (December 2019), PCR submitted at the 85th meeting, and fund balances will be returned upon financial completion;
 - (d) *RAC sector*: All technical assistance and conversions have been completed, including twenty-nine RAC lines (R-290, R-410A and compressors) with the total phase-out of 10,813.7 mt of HCFC-22 (of which 10,488.1 mt are associated with locally-owned enterprises). An extension to 31 December 2021 is requested to allow continued sales of R-290 RAC equipment, and associated disbursement of incremental operating costs (a detailed progress report submitted to the 86th meeting is presented below);
 - (e) *Solvent sector*: Sector plan operationally completed (December 2017), PCR submitted to the 81st meeting, and there were no balances reported; and
 - (f) *Refrigeration servicing sector*: Sector plan operationally completed (December 2018), PCR submitted to the 84th meeting, and there were no balances reported.

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

14. Based on decision 69/24, information on interest accrued as of the end of 2019 was provided through an audit report on the disbursement for stage I and stage II of the HPMP sector plans of 2019 submitted by UNDP on 8 September 2020, as shown in Table 5. The audit report also indicated that "the financial statement of project grant and disbursement of the HPMP (stages I and II) is complied with the rules of the Montreal Protocol on ODS and the Chinese Institution Accounting Standard. The statement of project grant

³ A progress report on the XPS foam, PU foam, ICR, solvent, and servicing sector plans have not been included as stage I for these sectors have already been completed.

and expenditure has been fairly and justly presented in all material respects from 1 January to 31 December 2019 by FECO.”

Table 5. Information provided on interest accrued in 2019

Sector plan	Interests accrued 2019 (US \$)		
	Stage I	Stage II	Total
XPS foam (UNIDO/Germany)	1,670	3,995	5,665
PU foam (World Bank)	3,251	628	3,879
ICR (UNDP)	41,456	45,418	86,874
RAC (UNIDO)	24,085	2,128	26,213
Solvent (UNDP)	0	891	891
Servicing (UNEP /Japan)	746	6,726	7,472
Total	71,207	59,786	130,993

Recommendation

15. The Executive Committee may wish to request the Treasurer to offset the interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of sector plans under stages I and II of the HCFC phase-out management plan (HPMP), as per decisions 69/24 and 77/49(b)(iii), as follows:

- (a) To request the Treasurer to offset future transfers to UNIDO by US \$5,665 representing interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of the extruded polystyrene foam sector plan under stages I and II of the HCFC phase-out management plan (HPMP), as per decisions 69/24 and 77/49(b)(iii);
- (b) To request the Treasurer to offset future transfers to the World Bank by US \$3,879, representing interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of the polyurethane foam sector plan under stages I and II of the HPMP, as decisions 69/24 and 77/49(b)(iii);
- (c) To request the Treasurer to offset future transfers to UNDP by US \$86,874, representing interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of the industrial and commercial refrigeration sector plan under stages I and II of the HPMP as per decisions 69/24 and 77/49(b)(iii);
- (d) To request the Treasurer to offset future transfers to UNIDO by US \$26,213, representing interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of the room air-conditioning sector plan under stages I and II of the HPMP, as per decisions 69/24 and 77/49(b)(iii);
- (e) To request the Treasurer to offset future transfers to UNEP by US \$7,472, representing interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of the refrigeration servicing sector plan and the national enabling programme under stages I and II of the HPMP, as per decisions 69/24 and 77/49(b)(iii); and
- (f) To request the Treasurer to offset future transfers to UNDP by US \$891, representing interest accrued by the Government of China up to 31 December 2019 from funds previously transferred for the implementation of the solvent sector plan under stage II of the HPMP, as per decisions 69/24 and 77/49(b)(iii).

Progress report on stage I of the room air conditioning (RAC) sector plan (UNIDO)

16. 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 84/68(d)(i).

17. All 24 RAC lines and three compressors lines based on HCFC-22 refrigerant had been fully converted and completed national acceptance to R-290 (18 RAC lines) R-410A (eight RAC lines) and R-290 (three compressor lines) as presented in Table 1. 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 and were funded from sources outside the Multilateral Fund. In addition, 240 mt of HCFC-22 were phased out through the demonstration project at Midea approved at the 61st meeting.

Table 1. Progress in the implementation of the RAC sector plan in China

Type of lines	Total	Converted	National acceptance	HCFC-22 consumption (mt)
R-290 RAC	18	18	18	7,827.3
R-410A RAC	8	8	8	2,986.4
R-290 compressor	3	3	3	n/a
Total	29	29	29	10,813.7

18. As of August 2019, a total of 183,970 R-290 split units and 473,009 factory-sealed R-290 units had been manufactured.⁴ Between 1 September 2019 and 31 August 2020, a further approximately 100,000 R-290 split units and over 1,000,000 factor-sealed R-290 units were manufactured;⁵ third party verification of those sales is ongoing. A total of US \$3,374,145 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.

Level of fund disbursement

19. As of September 2020, of the US \$75,000,000 approved, US \$60,727,617 (81 per cent) had been disbursed by UNIDO and US \$64,077,440 (85 per cent) had been disbursed by FECO⁶ 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	32,786,917	8,316,800	7,608,900	8,662,500	3,352,500	60,727,617
Disbursed by FECO	33,259,197	7,005,129	8,069,073	9,545,113	6,198,929	64,077,440**

* Excluding agency support costs

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

⁴ At the 84th meeting, it was reported that 178,163 R-290 split units and 550,000 factory-sealed R-290 units had been manufactured through August 2019. Those figures have been updated following the third party verification undertaken for the 86th meeting.

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

⁶ 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

20. All conversion projects and technical assistance activities⁷ have been completed. However, sales of R-290 RAC equipment have been lower than expected given the COVID-19 pandemic, which affected the manufacturing and marketing of R-290 RAC equipment; moreover, it has not yet been possible to independently verify the sales that took place after 1 September 2019. Accordingly, China is proposing to extend the date of completion of stage I to 31 December 2021, to allow for increasing sales of R-290 RAC equipment and payment of the associated IOCs to beneficiary enterprises.

Secretariat's commentsHCFC consumption

21. The consumption of HCFC-22 in the RAC sector in 2019 was 50,000 mt (2,750 ODP tonnes), which is lower than the maximum allowable consumption in the Agreement between the Government of China and the Executive Committee (Table 3); however, that consumption is higher than the 2019 quota of 2,692 ODP tonnes given consumption by RAC manufacturing enterprises smaller than 100 mt/year of HCFC-22, which do not require a quota. Given consumption by those smaller enterprises, at the 81st meeting the Secretariat had noted the potential future risk of non-compliance with the sector target, and suggested allocating a lower quota than the target, or reducing the level of consumption of enterprises that do not require a quota.⁸ The 2019 quota was set below the maximum allowable consumption for that year. The 2020 quota for the sector has been issued at 35,215 mt (1,937 ODP tonnes).

Table 3. HCFC-22 consumption and targets for the RAC sector

RAC sector plan		2015	2016	2017	2018	2019
Consumption	mt	54,000.0	55,000.0	55,000.0	52,000.0	50,000.0
	ODP tonnes	2,970.0	3,025.0	3,025.0	2,860.0	2,750.0
Maximum allowable consumption	mt	67,231.0	67,231.0	67,231.0	52,291.0	52,291.0
	ODP tonnes	3,697.7	3,697.7	3,697.7	2876.0	2876.0

Implementation of the IOC incentive scheme

22. In September 2019, in consultation with the China Household Electric Appliances Association (CHEAA) and the manufacturers, FECO modified the IOC incentive scheme as follows: R-290 split air-conditioning (AC) units manufactured before 31 August 2019 would be paid according to the energy efficiency and type of compressors used (inverter or fixed-speed), in line with the scheme proposed at the 83rd meeting, (as shown in Table 4), with the subsidy decreasing with time (i.e., units manufactured between 1 September 2019 and 29 February 2020 would receive a subsidy at 50 per cent; between 1 March and 31 August 2020 at 25 per cent; and after 1 September 2020 at 12.5 per cent).

Table 4. IOC incentive scheme agreed at the 84th meeting (RMB*/unit)

Split units	Criteria	
	Inverter	Fixed-speed
Local sales		
Grade 1 energy efficiency	600	500
Grade 2 energy efficiency	360	300
Grade 3 energy efficiency	200	150
Export to Article 5 countries	360	300
Export to non-Article 5 countries	0	0

* Renminbi = RMB

⁷ Additional technical assistance activities to facilitate the introduction of R-290 RAC technology would be conducted under stage II of the RAC sector plan.

⁸ Paragraphs 105-108 of UNEP/OzL.Pro/ExCom/81/29.

23. Subsequent to the 84th meeting, the COVID-19 pandemic broke out and production and marketing of R-290 ACs were interrupted. Moreover, given the global downturn in the economy, the market uptake of R-290 RAC technology faced increased challenges. Accordingly, China proposed to modify the IOC incentive scheme such that 25 per cent of the IOCs would be provided for R-290 split units sold until 31 August 2021, and 12.5 per cent for units sold on 1 September 2021 and beyond, as shown in Table 5.

Table 5. Revised IOC incentive scheme (RMB/unit)

Split units		Until 31 August 2021		After 1 September 2021	
		Inverter	Fixed-speed	Inverter	Fixed-speed
Local	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

24. 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; and would continue to be provided only on the sale of split R-290 ACs to China and other Article 5 countries. IOCs will not be paid on sale of factory-sealed units, such as portable ACs, window-type ACs, and dehumidifiers, which are already established in the marketplace. The Secretariat noted that IOCs would only be provided under stage I for R-290 RAC units sold before the completion of stage I (i.e., the right-hand columns would apply between 1 September 2021 and 31 December 2021).

25. In line with decision 84/68(d)(ii), UNIDO provided information on the effect of the IOC incentive scheme on the market uptake of R-290 split AC units. All the 183,970 R-290 split units sold by August 2019, were sold locally; the majority of the sales were for fixed-speed units; and approximately two-thirds of the sales were for units with grade 2 energy efficiency, as shown in Table 6.

Table 6. Percentage of R-290 RAC split units by energy class sold by 31 August 2019

Split units	Criteria	
	Inverter	Fixed-speed
Local sales		
Grade 1 energy efficiency	0	27
Grade 2 energy efficiency	6	65
Grade 3 energy efficiency	0	2
Export to Article 5 and non-Article 5 countries	0	0

Conclusion

26. All conversions and technical assistance activities have been completed. The disbursement from FECO to the final beneficiaries is 81 per cent, and the consumption of HCFC-22 in the sector remains below the targets specified in the Agreement with the Executive Committee. Notwithstanding continued efforts by the Government of China, CHEAA, industry and UNIDO, manufacturing of R-290 RAC equipment on the converted lines continues to be very low,⁹ reflecting limited local and global market penetration; the COVID-19 pandemic has further limited the market update of the technology. Accordingly, the Secretariat supports the extension of stage I to 31 December 2021 and the revised IOC incentive scheme proposed by the Government of China, while noting that additional and sustained efforts will be required, including those planned under stage II, for the successful market introduction of the technology. The Secretariat notes that all other sectors under stage I have been completed, and that any remaining balances from those sectors

⁹ The manufacturing capacity of the 17 converted lines is approximately 7 million units/year. Accordingly, the capacity utilization between 1 September 2019 and 31 August 2020 is approximately 1 per cent.

would be returned in line with the financial completion of those sectors, irrespective of the extension of stage I of the RAC sector.

Recommendation

27. The Executive Committee may wish to consider:

- (a) Noting 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), 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;
- (b) Noting the revision to the IOC incentive scheme for the RAC sector plan, as reflected in document UNEP/OzL.Pro/ExCom/86/21/Add.1;
- (c) Approving the extension of implementation of the RAC sector plan of stage I of the HPMP to 31 December 2021, on an exceptional basis noting that the COVID-19 pandemic affected the manufacturing and marketing of R-290 RAC equipment, and on the understanding that no further extension would be requested, and that any remaining balances from other sectors under stage I that have been completed would be returned in line with the financial completion of those sectors; and
- (d) Requesting the Government of China and UNIDO to submit progress reports on the implementation of the work programme associated with the final tranche of the RAC sector plan on a yearly basis through the completion of the project, the project completion report by 30 June 2022, and to return any remaining balances by 31 December 2022.

PART II STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN

Overview of the overarching strategy for stage II

28. Between its 76th and 77th meetings, the Executive Committee approved stage II of HPMP for China with associated sectors plans, and at its 79th meeting, approved its Agreement with the Government for the implementation of stage II of the HPMP.

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

Table 1. HCFC consumption limits and phase-out for stage II of the HPMP (ODP tonnes)

Maximum allowable consumption							
Sector plan	2016-17	2018-19	2020-21	2022	2023-24	2025	2026
National	16,978.9	15,048.1	11,772.0**	n/a	n/a	n/a	n/a
XPS*	2,286.0	2,032.0	1,397.0	1,397.0	762.0	165.0	0.0
PU*	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	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Phase-out by sector							
Sector plan	2018	2020	2023	2025	2026	Total	Reduction by baseline (%)
XPS*	254.0	635.0	635.0	597.0	165.0	2,286	100 in 2026
PU*	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		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 foam; PU= polyurethane foam; ICR=industrial and commercial refrigeration and air-conditioning; RAC=room air-conditioning manufacturing and heat pump water heaters.

** This is the national maximum allowable consumption for 2020 only; for the period 2021 to 2026, it will be determined during submission of stage III of the HPMP.

30. 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 servicing sector and national enabling programme (US \$3,850,000); and for the second tranche of the PU foam (US \$10,600,000) sector plan. Consideration of these requests were subsequently deferred, and details on the deliberation of these funding tranches and decisions taken by the Executive Committee are included in Annex I to the present document.

Adjustments to stage II decided at the 84th meeting, including amounts of HCFC to be phased out and associated funding

31. At the 84th meeting, upon consideration of the funding tranche requests of sector plans of 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 (decision 84/69):

- (a) With regard to stage II of the HPMP:
 - (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 the 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 (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 servicing sectors and national 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 rows 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 servicing sector and national enabling programme, consistent with the revised Appendix 2-A referred to in sub-paragraph (a)(ii), above;
 - (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 servicing sectors and national enabling programme also due for submission at the 86th meeting; and

- (b) To request the World Bank, on behalf of the Government of China, to submit at the 86th meeting a revised proposal for stage II of the HCFC production phase-out management plan (HPPMP) for the country.

32. At the 85th meeting, the relevant bilateral and implementing agencies re-submitted requests for the third tranches of the XPS foam, ICR, and solvent sector plans, and for the second tranche of the PU foam sector plan, that had been submitted prior to adoption of decision 84/69, but had been deferred. 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.

Overview of the revised plans of action for the sector plans of stage II (2021-2026)

33. In considering all the elements of decision 84/69, UNDP, as lead implementing agency, submitted on behalf of the Government of China an overview of the adjustment made to the six sector plans associated with stage II of the HPMP. Taking into account the knowledge and experience accumulated during preparation and implementation of stage I (completed) and stage II, the revision of the sector plans was undertaken by the Government of China with the support of the relevant bilateral and implementing agencies providing assistance under stage II, including the Government of Austria as cooperating agency in the RAC sector, as shown in Table 2.

Table 2. Agencies involved in the preparation of the revised plans of action for stage II of the HPMP

Sectors	Preparation agency	Bilateral and implementing agencies
Overarching	FECO/MEE	UNDP
ICR	FECO/MEE, China Refrigeration and Air-conditioning Industry Association (CRAA)	UNDP
RAC	FECO/MEE, China Household Electrical Appliances Associations (CHEAA)	UNIDO, Austria, Italy
Servicing	FECO/MEE, CRAA, CHEAA	UNEP, Germany, Japan
XPS foam	FECO/MEE, Beijing Technology and Business University	UNIDO, Germany
PU foam	FECO/MEE, Peking University, China Plastics Processing Industry Association (CPPIA)	World Bank
Solvent	FECO/MEE, Beijing University of Chemical Technology	UNDP

Adjustment to the amounts of HCFCs to be phased-out

34. The Government of China applied the following principles regarding the HCFC phase-out targets:
- (a) For the XPS foam, PU foam and solvent sector plans, the phase-out targets remain as originally approved;
- (b) For the ICR and RAC sectors, the phase-out targets were extended from 2022 to 2026 considering the timetable stipulated by the Montreal Protocol and the specific situation of each sector; and

- (c) For the refrigeration servicing sector and national enabling programme there are no specific consumption targets stipulated in the Agreement; thus, consumption will be based on the servicing demand for HCFCs, maintaining flexibility under the precondition of meeting the overall national compliance targets.

35. A summary of the changes to the remaining eligible consumption due to additional reductions in HCFC consumption between 2021 and 2026 in the ICR and RAC sector plans and the refrigeration servicing sector and enabling programme is presented in Table 3.

Table 3. Additional HCFC to be phased-out during stage II of the HPMP (ODP tonnes)*

Substance	Original	Revised	Difference
HCFC-22	3,878.80	6,631.46	2,572.66
HCFC-123	2.70	7.94	5.24
HCFC-124	0.00	0.86	0.86
HCFC-141b	4,187.18	4,187.18	0.00
HCFC-142b	646.02	727.87	81.85
HCFC-225	1.13	1.13	0.00

* Total phase-out to be achieved under the revised stage II of the HPMP.

Funds allocation and approaches proposed per sector (2021-2026)

36. As a result of decision 84/69, funding for stage II of the HPMP was adjusted from US \$500,100,000 approved in principle to US \$247,419,890. Prior to the 85th meeting, US \$102,419,890 was approved for tranches of the six sector plans, and an additional US \$27,000,000 was approved for tranches of the PU foam, XPS foam, ICR, and solvent sector plans at the 85th meeting, bringing the total funding so far approved to US \$129,419,890. Accordingly, the balance available for activities between 2021 and 2026 amounts to US \$118,000,000.

37. For allocating the balance available among the sector plans, the Government took into consideration the specific situation of each sector, including amounts of HCFCs to be phased out, cost-effectiveness approved in previous sector plans, the implementation progress achieved, alternative technology maturity, and the challenges being faced.

38. The Government will be allocating approximately 10 per cent of the funding available for activities related to policy development and revision, sectoral coordination, international exchange and cooperation, and capacity building at both the national level and sector level. The activities included in each sector are described in more detail in each revised plan of action contained Part III of the present document.

39. In the case of the ICR and RAC sector plans, due consideration was given to the additional phase-out of HCFCs to be achieved between 2021 and 2026. A summary of the adjustments in HCFC consumption targets, and funding tranches for the ICR and RAC sector plans is presented in Table 4.

Table 4. HCFC consumption targets and adjusted funding tranches for the ICR and RAC sectors

Year	ICR sector plan				RAC sector plan			
	Maximum allowable consumption		Funding (US \$)		Maximum allowable consumption		Funding (US \$)	
	Original	Revised	Original	Revised	Original	Revised	Original	Revised
2016	2,162.50	2,162.50	13,368,756	13,368,756	3,697.70	3,697.70	15,562,981	15,562,981
2017	2,162.50	2,162.50	20,000,000	20,000,000	3,697.70	3,697.70	16,000,000	16,000,000
2018	2,042.40	2,042.40	12,000,000	0	2,876.00	2,876.00	18,000,000	0
2019	2,042.40	2,042.40	16,000,000	0	2,876.00	2,876.00	14,000,000	0
2020	1,609.90	1,609.90	16,000,000	2,095,775	2,259.70	2,259.70	14,000,000	0
2021	1,609.90	1,609.90	11,776,041	9,000,000	2,259.70	2,259.70	11,581,816	4,500,000
2022	*	1,609.90	*	0	*	2,259.70	*	0

Year	ICR sector plan				RAC sector plan			
	Maximum allowable consumption		Funding (US \$)		Maximum allowable consumption		Funding (US \$)	
	Original	Revised	Original	Revised	Original	Revised	Original	Revised
2023	*	1,369.62	*	8,000,000	*	1,614.10	*	7,000,000
2024	*	1,369.62	*	0	*	1,614.10	*	0
2025	*	780.91	*	7,559,464	*	1,232.60	*	8,717,105
2026	*	780.91	*	8,134,246	*	1,232.60	*	8,613,995
Total			89,144,797	68,158,241			89,144,797	60,394,081

*Not established at the time of approval of stage II.

40. For the XPS foam, PU foam, solvent sector plans, and the refrigeration servicing sector and national enabling programme, only the funding level was adjusted as shown in Table 5.

Table 5. Adjusted funding tranches XPS foam, PU foam, solvent and refrigeration servicing sector (US \$)

Year	XPS foam		PU foam)		Solvent		Refrigeration servicing	
	Original	Revised	Original	Revised	Original	Revised	Original	Revised
2016	7,514,867	7,514,867	7,045,027	7,045,027	2,821,937	2,821,937	3,679,132	3,679,132
2017	9,000,000	9,000,000	10,600,000	0	3,777,190	3,777,190	2,650,000	2,650,000
2018	8,000,000	0	9,500,000	0	2,959,930	0	3,650,000	0
2019	9,600,000	0	12,700,000	0	3,229,030	0	3,650,000	1,000,000
2020	9,600,000	9,890,431	12,700,000	2,067,012	3,601,083	12,946,782	3,650,000	0
2021	15,000,000	5,000,000	20,000,000	4,000,000	7,888,921	2,500,000	3,010,868	2,000,000
2022	11,400,000	2,000,000	15,700,000	0	7,128,589	1,000,000	0	2,000,000
2023	11,300,000	3,000,000	15,600,000	5,000,000	3,664,360	2,000,000	0	2,000,000
2024	9,800,000	1,000,000	10,500,000	1,000,000	5,481,592	0	0	3,000,000
2025	9,600,000	4,000,000	13,100,000	5,000,000	2,707,880	523,431	0	1,200,000
2026	11,971,763	3,534,654	14,026,183	4,200,000	4,002,054	0	0	2,517,105
Total	112,786,630	44,939,952	141,471,210	28,312,039	47,262,566	25,569,340	20,290,000	20,046,237

41. Table 6 presents a summary of the overall funding allocation for stage II of the HPMP for China.

Table 6. Summary of funding allocation for stage II of the HPMP (US \$)

Sector plan	Approval in principle	Funding approved (2016-2020)*	Revised plan (2021-2026)	Adjusted approval in principle
ICR	89,144,797	35,464,531	32,693,710	68,158,241
RAC	89,144,797	31,562,981	28,831,100	60,394,081
Refrigeration servicing	20,290,000	7,329,132	12,717,105	20,046,237
XPS foam	112,786,630	26,405,298	18,534,654	44,939,952
PU foam	141,471,210	9,112,039	19,200,000	28,312,039
Solvent	47,262,566	19,545,909	6,023,431	25,569,340
Total	500,100,000	129,419,890	118,000,000	247,419,890

* Including US \$1,000,000 approved at the 84th meeting for the refrigeration servicing sector and enabling activities, and US \$27,000,000 approved at the 85th meeting for the ICR, XPS foam, PU foam and solvent sector plans.

Overview of the priorities of sector plans for stage II of the HPMP for the period 2021 to 2026

42. A summary of the priorities for each sector plan, for the period 2021 to 2026, is presented below:

- (a) *ICR sector*: Considering the limited funding and the large number of sub-sectors with complex product types and alternative technologies, the revised extended sector plan would fund first production line conversion projects to low-GWP alternative technologies in the four sub-sectors of freezer and refrigeration and condensing units, water chillers (heat pumps), unitary air-conditioners, and heat pump water heaters. Focus would be given to promote the production lines conversion in SMEs to test the feasibility and applicability of the selected alternative technologies. As a key component of the ICR equipment, the

conversion of compressor manufacturing lines was given priority. The revised extended sector plan also includes alternative technology research, revision of relevant standards, policies, publicity and training activities (UNDP) (US \$32,693,710);

- (b) *RAC sector*: Considering R-290 production line conversions completed under stage I of HPMP, as well as those being converted under the approved first two tranches of stage II, the revised extended sector plan focus on promoting the uptake into the market of R-290 RAC equipment, alternative technologies research, revision of relevant standards and policies, publicity and training activities. A limited number of additional manufacturing lines would be converted under the remaining tranches to R-290, and IOCs would be provided (UNIDO, Government of Austria) (US \$28,831,100);
- (c) *Servicing sector*: Based on activities carried out during stages I and II, the revised extended sector plan will focus on the servicing sector code and qualification requirements, revision of relevant policies and standards, capacity building for EEBs and customs, publicity and training of technicians, and coordinate with the conversion of the relevant manufacturing sector plans, to meet the long-term compliance requirements (UNEP, Governments of Germany and Japan) (US \$12,717,105).
- (d) *XPS foam sector*: Based on the limited funding, the number of investment projects in the revised sector plan has to be significantly reduced to 11 enterprises. The support for technical assistance (TA) activities such as publicity, training, supervision and management, research on the optimization of alternative technologies, and the formulation and revision of policies and standards would be strengthened (UNIDO, Government of Germany) (US \$18,534,654);
- (e) *PU foam sector*: Considering the limited funding, the project will focus on the conversion needs of SMEs, strengthen the role of system houses, and provide more funding to support conversion of SMEs. TA activities such as publicity, training, supervision and management, research on the optimization of alternative technologies, and the formulation and revision of policies and standards will be strengthened (World Bank) (US \$19,200,000);
- (f) *Solvent sector*: Considering the complexity of sub-sectors, variety of requirements and process for solvent cleaner, based on the investment projects already implemented during stages I and II, limited investment projects will be implemented, and TA activities *inter alia* revision of relevant policies and standards, publicity and training, supervision and management, will be strengthened (UNDP) (US \$6,023,431).

Draft revised Agreement for stage II of the HPMP

43. In line with decision 84/69(a)(vii), UNDP as the lead implementing agency of the overall stage II of the HPMP, submitted a draft revised Agreement reflecting only the relevant outcomes approved at the 84th meeting, specifically:

- (a) Extension through 2026 of stage II of the RAC, ICR, and refrigeration servicing sectors and national 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 of Appendix 2-A, and revisions to Appendix 8-A;
- (b) Figures for potential revisions to Appendix 2-A for:
 - (i) Row 1.2 specifying the maximum allowable total consumption of HCFCs in 2021-2026 to reflect the information under sub-paragraph (a), above;

- (ii) 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
 - (iii) Tonnages associated with rows 4.1.1 to 4.6.3 to reflect the information in sub-paragraphs (a), above; and
 - (c) A revised penalty clause in Appendix 7-A in line with the revised level of funding and HCFC phase-out.
44. In addition, UNDP proposed changes to paragraphs 5(c) and 7(a)(iv), respectively, of the draft revised Agreement:
- (a) To clarify that the random sample of the manufacturing lines to be verified in a given year represented at least 10 per cent of the consumption phased out in manufacturing lines converted with financial assistance from the Multilateral Fund in the sector in that year; and
 - (b) Changing the definition of a major change from 20 per cent of the total cost of the last approved tranche, or US \$2.5 million, whichever is lower, to 30 per cent of the last approved tranche.
45. The draft revised Agreement is presented in Annex II of the present document.

Secretariat's comments

46. To facilitate the review of the revised stage II of the HPMP for China, the Secretariat consolidated in Part III of the present document the revised sector plans of stage II of the HPMP submitted separately by the lead implementing agency of each plan. Specific comments by the Secretariat for each sector plan are also presented in Part III.
47. Under decision 84/69(a)(iii), the Executive Committee requested that the sector plans for the ICR and RAC and the refrigeration servicing and enabling programme be extended from 2021 (as originally approved) to 2026. On this basis, the Secretariat refers to these three sector plans as “revised extended plans of action” while for the sector plans for the XPS foam, PU foam and solvent refer as “revised plans of action” (as only the funding levels were adjusted).
48. With regard to the draft revised Agreement between the Government of China and the Executive Committee, the Secretariat notes the following:
- (a) The draft revised Agreement includes the adjustment to the agency support cost from 6.5 to 7.0 per cent of the second tranches approved for UNDP and UNIDO, in line with decision 81/45(a), which was not updated in the revised Appendix 2-A of the Agreement approved at the 84th meeting;
 - (b) Agency support costs for UNEP and the Government of Germany was adjusted to reflect adjusted totals approved in principle; and
 - (c) In Appendix 7-A, UNDP calculated the penalty at US \$40.32/ODP kg, including in addition to the 11,556.44 ODP tonnes of HCFCs to be phased out under stage II, 716.50 ODP tonnes phased out under the previous Agreement. As per the formula established in the template Agreement for stage II of HPMPs (i.e., two times the cost-effectiveness of the project in US \$/ODP kg), the Secretariat calculated the penalty clause at US \$42.82/ODP kg based exclusively on the tonnage to be phased out under stage II.

49. Decision 84/69(a)(vii) called for the submission of a draft revised Agreement reflecting only the relevant outcomes approved at the 84th meeting. The revised sector plans include a substantial increase in manufacturing line conversions for which funding was not allocated. Accordingly, the Secretariat considers the change proposed to paragraph 5(c) to be consistent with decision 84/69(a)(vii) and the Executive Committee's intent to independently verify a random sample of manufacturing lines that were converted with Multilateral Fund assistance.

50. While the Secretariat notes the wish of the Government of China for additional flexibility in implementing the sector plans by changing the definition of a major change, and that China was achieving a greater phase-out with less funding from the Multilateral Fund, the Secretariat did not consider that the proposed change in paragraph 7(a)(iv) reflects the outcomes approved at the 84th meeting, and therefore is not consistent with decision 84/69(a)(vii). The Government of China, through UNDP, indicated it considered the additional flexibility request to be in line with decision 84/69. The Executive Committee may wish to consider whether to include that change proposed by UNDP.

Recommendation

51. The Executive Committee may wish to:

- (a) Note:
 - (i) The revised extended plans of action for the industrial and commercial refrigeration, room air-conditioning manufacturing and heat pump water heaters and refrigeration servicing sectors and national enabling programme submitted in line with decision 84/69(a)(iii) and the revised plans of action for the extruded polystyrene foam, polyurethane foam and solvent sectors submitted in line with decision 84/69(a)(iv); and
 - (ii) The 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 decision 84/69(a)(iii), (iv) and (vii);
- (b) Whether to change the definition of a major change to 30 per cent of the last approved tranche in paragraph 7(a)(iv) of the draft revised Agreement; and
- (c) Approve the draft revised Agreement between the Government of China and the Executive Committee for the implementation of stage II of the HCFC phase-out management plan contained in Annex II to the present document.

PART III REVISED SECTOR PLANS FOR STAGE II OF THE HPMP FOR CHINA

Background

52. In addressing the elements of decision 84/69, on behalf of the Government of China, the relevant bilateral and implementing agencies submitted to the 86th meeting revised plans of action for the following six sectors included in stage II of the HPMP.

- Revised extended industrial and commercial refrigeration sector plan (UNDP)
- Revised extended room air-conditioning manufacturing and heat pump water heaters sector plan (UNIDO, Austria, Italy)
- Revised extended refrigeration servicing sector plan and national enabling programme (UNEP, Germany, Japan)
- Revised extruded polystyrene foam sector plan (UNIDO, Germany)
- Revised polyurethane foam sector plan (World Bank)
- Revised solvent sector plan (UNDP)

53. Each of these sector plans include a description of HCFC consumption targets and funds allocated, a description of the components of the plan, technologies selected and incremental cost. The Secretariat's comments and a recommendation are included on each sector plan.

REVISED EXTENDED INDUSTRIAL AND COMMERCIAL REFRIGERATION SECTOR PLAN (UNDP)

Sector plan description

Background

54. Stage II of the HCFC phase-out management plan (HPMP) for the industrial and commercial refrigeration sector (ICR) for China was approved at the 77th meeting at a total amount of US \$89,144,797, plus agency support costs, to phase out 480.50 ODP tonnes of HCFCs to achieve a 33 per cent reduction in relation to the 2013 maximum allowable consumption in the sector, on the understanding:

- (a) That a maximum quantity of 3,150 metric tonnes (mt) in the unitary air-conditioning (UAC) sub-sector could be converted to HFC-32;
- (b) That the Government of China would have flexibility in the UAC sub-sector to convert to alternatives with a lower global-warming potential (GWP) than HFC-32 as long as the cost and tonnage to be phased out remained the same;
- (c) That the Government of China would have flexibility to convert heat-pump water-heater (HPWH) lines to HFC-32 on the understanding that UAC and HPWH conversions to HFC-32 combined would not exceed 3,150 mt;
- (d) That at least 20 per cent of the total phase-out of HCFC-22 in the ICR sector would be from the conversion of small and medium-sized enterprises (SMEs) (i.e. those consuming 50 mt or less); and
- (e) That, in sectors other than the UAC sector, the Government of China would have flexibility to select from among the six low-GWP technologies identified in Table 8 of document UNEP/OzL.Pro/ExCom/76/25, excluding HFC-32, and would make best efforts to ensure that the tonnage remained within 30 per cent of the amount specified for each technology in that table, at no additional cost to the Multilateral Fund, and that any deviation

from that range would be reported to the Executive Committee for its consideration.

55. Stage II of the ICR sector plan proposes to phase out 8,822 mt (480.50 ODP tonnes) of HCFCs, of which 6,500 mt will be converted to low-GWP alternatives; and the remaining 2,322 mt will be phased out through technical assistance (TA) activities.

56. The second tranche of the ICR sector plan, and the corresponding 2017-2018 tranche implementation plan, was approved at the 80th meeting.

57. At its 84th meeting, the Executive Committee approved the revised Appendix 2-A of the Agreement between the Government of China and the Executive Committee for stage II of the HPMP to reflect, among others, the change in funding level for the ICR sector and the associated support cost in rows 2.1.1 and 2.1.2, and requested the implementing agency, on behalf of the Government of China, to submit, at the 85th meeting, the 2020 funding tranche requests for the ICR sector plan of stage II of the HPMP.

58. At the same meeting, the Executive Committee requested the Government of China, through the relevant bilateral and implementing agencies, to *inter alia* submit 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 ICR sector, and the maximum allowable sectoral consumption levels of HCFC (decision 84/69).

59. At its 85th meeting, the Executive Committee approved the third tranche of the ICR sector plan at the amount of US \$2,095,775, plus agency support costs for UNDP to support the continuous implementation of the conversion projects initiated in the first and second tranche.

60. In accordance with decision 84/69, UNDP, on behalf of the Government of China, has submitted to the 86th meeting a revised stage II of the ICR sector plan, which includes related activities and information on the technology selected and associated funding tranches to extend through 2026.¹⁰

Status of implementation of stage I of the ICR sector plan

61. Stage I of the ICR sector plan for China has been operationally completed and a project completion report (PCR) was submitted to the 85th meeting.

Status of implementation of stage II of the ICR sector plan

62. Based on the detailed progress report on the implementation of stage II submitted to the 85th meeting,¹¹ contracts for the conversion of 18 manufacturing lines (to phase-out 2,557.42 mt (140.66 ODP tonnes) of HCFC-22) were signed and the conversion of four lines had been completed. The latest progress since the 85th meeting have not been verified due to restrictions imposed by the COVID-19 pandemic.

HCFC consumption in ICR sector

63. The Government of China reported a consumption of 1,996.91 ODP tonnes of HCFCs in the ICR sector for 2019, which is 2.2 per cent below the maximum allowable consumption for the sector, as shown in Table 1.

¹⁰ As per the letter of 7 September 2020 from the Ministry of Ecology and Environment of China to UNDP.

¹¹ Paragraph 55-61 of document UNEP/OzL.Pro/ExCom/85/21.

Table 1. HCFC consumption in the ICR sector

Substance	2015	2016	2017	2018	2019*	Baseline
Target** (ODP tonnes)	2,162.50	2,162.50	2,162.50	2,042.40	2,042.40	n/a
Metric tonnes						
HCFC-22	35,700.00	37,500.00	37,500.00	36,000.00	36,000.00	43,467.50
HCFC-123	585.00	654.70	644.00	553.00	553.00	392.50
HCFC-142b	100.00	100.00	90.00	90.00	90.00	65.00
Total (mt)	36,385.00	38,254.70	38,234.00	36,643.00	36,643.00	43,925.00
ODP tonnes						
HCFC-22	1,963.50	2,062.50	2,062.50	1,980.00	1,980.00	2,390.71
HCFC-123	11.70	13.09	12.88	11.06	11.06	7.85
HCFC-142b	6.50	6.50	5.85	5.85	5.85	4.23
Total ODP tonnes	1,981.70	2,082.09	2,081.23	1,996.91	1,996.91	2,402.79

* Reported in the project proposal.

** Targets set in row 1.3.1 of Appendix 2-A of the Agreement with the Executive Committee.

64. The implementation of the activities in the HPMP, particularly the conversion of manufacturing capacities using HCFC-22 and the application of licensing and quota controls, has inhibited the growth of HCFC consumption. In 2019, HCFC consumption of 1,996.91 ODP tonnes accounted for 83 per cent of the ICR sector baseline.

Revised extended stage II of the ICR sector plan

Phase-out strategy

65. The revised extended stage II of the ICR sector plan will be implemented from 2021 to 2026 to reduce 15,225.28 mt (828.99 ODP tonnes) of HCFC consumption to achieve a 67.5 per cent reduction of the ICR sector baseline by 2025. The reduction will be achieved through the conversion of manufacturing lines, TA activities and policy measures. The consumption targets from 2020 to 2026 and the reduction as a percentage of the baseline are presented in Table 2:

Table 2: Maximum HCFC consumption targets from 2020 to 2026 for ICR sector (mt)

Substances	2020	2021	2022	2023	2024	2025	2026	Reduction (mt)
HCFC-22	28,997.73	28,997.73	28,997.73	24,666.27	24,666.27	14,066.45	14,066.45	14,931.28
HCFC-123	540.00	540.00	540.00	470.00	470.00	288.00	288.00	252.00
HCFC-142b	65.00	65.00	65.00	55.00	55.00	23.00	23.00	42.00
Total (mt)	29,602.73	29,602.73	29,602.73	25,191.27	25,191.27	14,377.45	14,377.45	15,225.28
ODP tonnes	1,609.90	1,609.90	1,609.90	1,369.62	1,369.62	780.91	780.91	828.99
Reduction (% of baseline)	33.0	33.0	33.0	43.0	43.0	67.5	67.5	34.5

66. Stage II of the ICR sector plan will take into consideration the HCFC phase-out and HFC phase-down at the same time to achieve synergy and maximize climate benefit. Activities planned in manufacturing line conversions, TA, regulatory measures and activities to promote market adoption of the alternative technologies will be conducted in a coordinated and balanced manner to optimize the impact from different activities. The conversion of manufacturing lines, focusing on conversion in SMEs, will assess the feasibility and viability of the selected technologies, overcome barriers and gain experiences in conversion so that other enterprises in the sector can convert to HCFC alternatives on their own. Gender mainstreaming will be integrated into all steps of the implementation process.

67. The revised extended stage II will give priority to the conversion of compressor manufacturing lines as a key driver for the conversion of water chillers, which is the largest consumption sub-sector in the ICR sector. It will also give priority to conversion of manufacturing lines in four sub-sectors (freezer, cold storage and condensing units; water chillers; UAC; and heat pump water heaters) as these are the major consumption

sub-sectors with a large number of SMEs and a fast-growing trend in HCFC consumption. The HCFC consumption in the vehicle AC sub-sector is very small and the HCFC consumption in multi-split AC sub-sector has mostly been phased out; the remaining consumptions in these two sub-sectors will be addressed through regulatory measures.

68. Of the 15,225.28 mt, 1,980 mt will be phased out through the conversion of manufacturing lines to low-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.

Activities planned for the revised stage II for the period from 2021 to 2026

69. The following activities have been planned for the revised stage II of the ICR sector and will be implemented in the period from 2021 to 2026.

Policy and regulatory framework

70. Policy and regulatory measures will be developed and implemented to ensure compliance; to provide incentives for phasing out HCFCs and adopting low-GWP alternatives; and to ensure that the ICR industry is not negatively affected by the phase-out activities. The planned policy measures include the following:

- (a) Amending the ODS Management Regulation to support the continuous HCFC phase-out and HFC phase-down;
- (b) Enforcing the licensing and quota system to control HCFC production, sales and uses, gradually reducing domestic supply of HCFCs in accordance with control targets to create an enabling environment for HCFC phase-out in the ICR sector;
- (c) Updating the list of recommended key alternatives to include newly developed low-GWP alternatives to HCFCs;
- (d) Developing policy incentives to promote the adoption of zero-ODP and low-GWP refrigerants;
- (e) Developing and updating the list of environmentally friendly products for green labeling and updating governmental procurement catalogues to promote their adoption;
- (f) Banning the use of HCFCs in the sub-sectors for which mature alternative technologies are available based on assessments of the socio-economic and environmental impact; and
- (g) Encouraging and supporting research, development and the adoption of alternative technologies to HCFCs by including those alternatives in the list of environment-friendly technologies for national industrial technology policies.

Conversion of manufacturing lines

71. In stage II of the ICR sector plan, 31 manufacturing lines will be converted to low-GWP technologies to phase out 1,980 mt. Of this amount, 580 mt (31 per cent) will be converted to HFC-32, and 1,400 mt (69 per cent) will be converted to other selected low-GWP technologies. Thirty per cent of the 1,980 mt will be phased out by SMEs. The phase-out and alternative technologies are presented in Table 3.

Table 3: HCFC phase-out and alternative technologies in different sub-sectors (mt)

Sub-sector		HFC-32	NH ₃	NH ₃ /CO ₂ , HFO and blends*	CO ₂ and R-290	CO ₂ /HFC-134a CO ₂ /HFC-32	Total	
Freezers and refrigeration and condensing units	SMEs					370	370	1,040
	Large scale		80	590			670	
Water chiller (heat pump)	SMEs	110					110	440
	Large scale			330			330	
Heat pump water heater	SMEs	50			30		80	80
	Large scale							
UAC	SMEs	100					100	420
	Large scale	320					320	
Total	SMEs	260	0	0	30	370	660	
	Large scale	320	80	920	0		1,320	
	Total	580	80	920	30	370	1,980	

* HFO and its blends, including HFO-1234yf, HFO-1234ze(E), HFO-1234ze(Z), HCFO-1233zd(E), and HFO-1336mzz(Z), as well as R-513A, R-515A and so on containing these substances.

72. The manufacturing line conversions and alternative technologies are presented in Table 4. In addition, two compressor lines will be converted to R-513A during the period from 2021 to 2023.

Table 4: Manufacturing line conversions and alternative technologies in sub-sectors

Sub-sector	HFC-32	NH ₃	NH ₃ /CO ₂ and HFO and blends	CO ₂ and R-290	CO ₂ /HFC-134a and CO ₂ /HFC-32	Total
Freezers, refrigeration, condensing units		1	5		9	15
Water chiller (heat pump)	3		5			8
Heat pump water heater	1			1		2
UAC	6					6
Total	10	1	10	1	9	31

TA activities

73. The following research, testing and evaluation activities will be implemented:

- (a) Survey and assessment for different sub-sectors and applications on the status of the transition to non-ODS alternatives, and preparing bans on the import and manufacture of HCFC-based equipment and components;
- (b) Testing and assessing potential alternatives, including HFO-1234ze(E), R-513A, R-515A and other HFOs and HFO-based blends in screw units, and R-452B, R-454B and other HFOs and HFO-based blends in scroll units;
- (c) Research on optimizing the charge size of HFC-32 units in order to overcome the limitations in the safety standards on the charge size to promote wider adoption;
- (d) Research on: the development of safety regulations, safety measures in the manufacturing process, and on measures to control risk in the transportation, installation and use of equipment charged with flammable refrigerants;

- (e) Research on improving the performance of alternative technologies (including R-513A and others) to meet product standards including energy efficiency, as currently these products have not been able to meet the standards;
- (f) Risk assessment of flammable refrigerants (R-290, HFC-32, HFOs and HFO blends), testing the combustion characteristics after leakage and assessing the risk of using R-290 in UACs, multi-split ACs (heat pump) and small and medium-sized chillers; and optimizing structural design and safety measures; and
- (g) Research on the technical barriers in the process of adopting low-GWP alternatives in SMEs.

74. Stage II will also revise six technical standards and develop four new ones to support the adoption of low-GWP alternatives including flammable, toxic and high-pressure refrigerants, as shown in Table 5.

Table 5: Standards to be developed and revised in stage II of the ICR sector plan

Standard	Standard No.
Refrigeration and air-conditioning (RAC) equipment safety technical specification	New standard
Safety requirements for air handling units	GB/T 10891-1989
Screw refrigerant compressors	GB/T 19410-2008
Hermetic refrigerant compressor for low-ambient-temperature air-source heat pump	New standard
Water chilling (heat pump) packages using the vapor compression cycle—Part 1: Water chilling (heat pump) packages for industrial and commercial and similar applications	GB/T 18430.1-2007
Water-source (ground-source) heat pumps	GB/T 19409-2013
Heat pump water heater for commercial and industrial and similar applications	GB/T 21362-2008
Air-source heat pump air heater	New standard
Small-sized and similar heating and air-conditioning and hot water packages	JB/T 10916-2008
Refrigeration system for small and medium-sized cold store	New standard

75. Training, information exchange and seminars will be organized to support conversion and disseminate information on the latest developments in alternative technologies and standards, including:

- (a) Training for manufacturers on technical issues during the conversion of manufacturing lines; and formulating training materials that take into consideration the experience gained and the evaluation results of the conversion projects already implemented in the sector;
- (b) Providing support and training for SMEs:
 - (i) Two training sessions each year on the conversion of manufacturing lines, including product development, component selection, conversion processes, and measures to address safety;
 - (ii) Preparing technical guidelines on conversion to alternatives in to support transition to non-HCFC technologies;
 - (iii) Establishing a team of experts to provide one-on-one technical guidance including formulating conversion plans to meet the specific conditions of the enterprise; and providing technical support, consultation, and on-site guidance during the conversion process;

- (c) Compiling established industrial standards for alternative technologies and developing a training manual for applying these standards; organizing two training seminars per year on industrial standards for manufacturers;
- (d) Organizing international seminars twice a year to provide training, information exchange and experience sharing about manufacturing-line conversion, governmental policies, and the outcomes of research on alternative refrigerants in conjunction with the activities organized by the China Refrigeration and Air-Conditioning Industry Association (CRAA); and
- (e) Participating in international seminars on the latest developments in alternative technologies for the ICR industry.

76. The following awareness-raising and information exchange and dissemination activities will be conducted to promote the use and market penetration of alternative technologies:

- (a) A yearly Ozone to Climate technology roadshow and industry roundtable seminar to provide a platform and opportunity to display environmentally friendly zero-ODP, lower-GWP alternative technologies, and disseminate latest policies, conversion processes, alternative technologies, outcomes of research and updates on alternatives;
- (b) Disseminating information through various media and the websites of industrial associations to raise awareness on national policies, international trends and the benefits of alternative products, and to eliminate end-users' safety concerns regarding products using flammable alternatives;
- (c) Market research on alternative products, to remove barriers to the market adoption of products using alternatives; and conducting targeted training and marketing activities to support the market penetration of alternative technologies;
- (d) Promoting green and environmentally friendly alternative technologies by providing support and endorsement during product launches, online and on-site exhibitions, and other marketing activities; and guiding end-users in selecting environmentally friendly products;
- (e) Promoting green alternative technologies among architects and guiding them to select green alternative technologies;
- (f) Publicity activities for component manufacturers; promoting and accelerating research and development and mass production of components to gradually reduce costs; synchronizing the production of components and equipment; and enhancing the competitiveness of alternative products in the market; and
- (g) Supporting enterprises in exporting ICR products using low-GWP alternative technologies to overseas markets.

Project management and monitoring

77. The project implementation and monitoring unit (PMU) established in stage II will continue its efforts in project implementation, coordination, monitoring and reporting. Due to the reduced funding, the PMU will put more effort into developing and enforcing regulatory measures to ensure compliance with consumption targets.

78. The CRAA will continue to provide technical support to the PMU in the overall phase-out activities and conversions in the ICR sector, including: providing assistance in conversion projects, monitoring progress, verifying the progress of implementation at the enterprise level, coordinating TA activities, assisting in tracking the availability and selecting the alternative technology, organizing national experts to evaluate the viability of alternative technologies, providing advice to enterprises in selecting alternatives, and collecting and compiling the HCFC consumption data.

Cost of the revised stage II of the ICR sector plan

79. The revised stage II of the ICR sector plan consists of investment and non-investment activities. The cost of investment activities includes incremental capital costs (ICC) and incremental operating costs (IOC). The cost of non-investment activities includes project management, TA, market promotion and awareness-raising activities.

Cost of the conversion of compressor manufacturing lines

80. The incremental costs for the conversion of compressor lines include parts and shell production casting moulds, tooling fixtures, cutters, tooth-shaped grinding wheels, and compressor-assembly conveyor equipment and leak-detection equipment.

81. The actual cost of conversion of a screw-compressor line was US \$2 million per line in stage I. In view of the reduced funding, US \$1.2 million was requested for the conversion of one compressor line, bringing the total for two lines to US \$2.4 million.

Cost of the conversion of RAC equipment manufacturing lines

82. The ICCs of equipment manufacturing conversion include: adaptive design of product; prototyping; production line conversion (heat exchanger dies, charging machine, leak detectors, vacuum pumps, safety measures for production assembly line, etc.); performance-testing centre retrofitting; production-line commission and trial production; and training for operation, safety and after-sales service. The IOC of conversion include: the incremental cost of the raw materials, components and accessories, compressors, pipelines and electric safety devices after the adoption of the alternative technology.

83. The incremental cost has been calculated on the assumption that there will be no technology upgrades or capacity increase, and based on the prices prevailing in 2020. The actual conversion cost in stage I was used as the cost threshold for SMEs below 20 mt, while the threshold for lines consuming more than 20 mt have been reduced, as shown in Table 6:

Table 6. Cost thresholds for conversion in revised stage II of the ICR sector plan (US \$/kg)

Scale of enterprises	HFC-32	NH ₃	NH ₃ /CO ₂ , HFO and blends	CO ₂ and R- 290	CO ₂ /HFC- 134a and CO ₂ /HFC-32
Enterprises with consumption greater than 50 mt per year	6.30	6.90	9.40	12.00	8.00
Enterprises with consumption between 20 to 50 mt per year	9.10	9.97	13.58	17.33	11.56
SMEs with consumption less than 20 mt per year	14.00	15.33	20.89	26.67	17.78

84. According to the above thresholds and the phased-out tonnages presented in Tables 3 and 4, the conversion costs have been calculated for each sub-sector and alternative technology, as shown in Table 7.

Table 7. Costs for manufacturing-line conversions in sub-sectors (US \$1,000)

Sub-sector	HFC-32	NH ₃	NH ₃ /CO ₂ , HFO, HFO blends	CO ₂ , R-290	CO ₂ /HFC-134a, CO ₂ /HFC-32	Total
Freezers, refrigeration condensing units	0.0	812.7	7,322.0	0.0	5,396.8	13,531.5
Water chillers	1,295.0	0.0	4,878.0	0.0	0.0	6,173.0
Heat pump water heaters	553.0	0.0	0.0	706.7	0.0	1,259.7
UACs	3,934.0	0.0	0.0	0.0	0.0	3,934.0
Total	5,782.0	812.7	12,200.0	706.7	5,396.8	24,898.2

Total cost requested for the revised extended stage II of ICR sector plan

85. A summary of the activities and cost breakdown of the revised stage II of the ICR sector plan is presented in Table 8.

Table 8. Activities and cost breakdown of the revised extended stage II of the ICR sector plan

Description	Funding (US \$)
Conversion projects	
Conversion of two compressor manufacturing lines	2,400,000
Conversion of 31 equipment manufacturing lines	24,898,200
Sub-total of conversions	27,298,200
TA	
Research activities on alternative technologies	1,093,482
Developing four new standards and revising six existing ones	500,000
Assessment of policy effects on bans	300,000
Technical training workshops and seminars	400,000
Public awareness-raising and promotion activities	400,000
Technical support to the CRAA	653,874
Verification of progress milestones and achievements	180,000
Expert consultants	40,000
Meetings and workshops	30,000
Sub-total of TA	3,597,356
Project management, monitoring, coordination and reporting	1,798,154
Total	32,693,710

86. In line with decision 83/61, which requests the phase-out plans to include the specific activities to be implemented by the PMU and the associated funding, a breakdown of the PMU budget of US \$1,798,154 is presented in Table 9.

Table 9. Breakdown of costs for the PMU

Particulars	Cost (US \$)
Project staff	623,960
Domestic travel	75,522
International travel	8,990
Domestic meetings	66,532
Consulting service	59,339
Support staff	499,887
Computer, internet, post, phone, printing	124,073
Office operation service and maintenance, utilities	339,851
Total	1,798,154

Co-funding

87. The cost of the revised extended stage II ICR sector plan was estimated based on the cost-effectiveness (CE) of implemented projects and the available funding. The actual cost will be higher than the funding requested. To ensure smooth, efficient and successful implementation of the sector plan, enterprises must raise additional funding by themselves.

Secretariat's comments

The commitment to meeting compliance targets

88. The consumption targets proposed for the ICR sector are in accordance with the Montreal Protocol phase-out schedule. The submission highlighted several challenges, including: the complexity of the sector with its wide range of non-standard products and significant difference in the configuration of the manufacturing lines; the high number of SMEs with limited technical capability; the limited number of viable alternative low-GWP technologies; and the limited resources available. However, UNDP confirmed that the Government is committed to meeting the compliance targets in the Montreal Protocol and those in its Agreement with the Executive Committee.

Completion of stage I of the ICR sector plan

89. Upon an enquiry on the disbursement of IOC and on production with alternative technologies on the converted lines in stage I, UNDP explained that all disbursement of IOC is based on the products manufactured and sold; all the funds have been committed and partial IOC have been disbursed to the outstanding 15 manufacturing lines converted to HFC-32. The sales of HFC-32 products are limited, but the enterprises are actively taking action to promote marketing. There is no issue in market adoption for the products converted to other alternative technologies in stage I.

90. The Secretariat noted that a PCR has been submitted to the 85th meeting and enquired about the estimated level of funding to be returned upon financial completion. UNDP reported that, as of 1 October 2020, all the funds have been disbursed except for the committed IOCs. The outbreak of the COVID-19 pandemic has impacted the production and sales in the converted lines and the resumption of production and sales is slow. The undisbursed balance stands at US \$3,731,830. Depending on how the market recovers and the sales demand, the disbursement of IOC is expected to be completed by 31 December 2021.

Overarching strategy and sustainability

91. The Secretariat further notes that the revised stage II of the ICR sector plan covers the period from 2021 to 2026, and enquired how the revised stage II would be connected with the activities already implemented in the original approved stage II. UNDP explained that the original stage II of the ICR sector plan aimed at reducing 480.5 ODP tonnes of HCFCs by 2021; so far, 18 manufacturing lines have undertaken conversions and will result in a reduction of 140.66 ODP tonnes (2,557.42 mt) of HCFC-22. Considering that there was no new funding released for the period from 2018 to 2020, the remaining tonnage of 339.83 ODP tonnes has been phased out through policy measures. The Government has issued production and consumption quotas for 2020 to achieve the control target.

92. In the revised extended stage II, more funding has been allocated to TA activities (11 per cent) as compared to the amount planned in the original stage II (7 per cent). The TA and awareness-raising activities are expected to disseminate the outcomes of the conversions, and support the further scale-up and market penetration of the conversion technologies so that more enterprises will convert their manufacturing lines with their own funding through technical support. Given the challenges facing the implementation, the Secretariat considers this shift meaningful.

93. Noting that, in the revised extended stage II, 13,245.28 mt of consumption will be phased out through TA and policy measures, the Secretariat enquired about what proportion of this amount would be converted to low-GWP alternatives, and how the phase-out would be managed and monitored. UNDP responded that the selection of alternative technologies for the unfunded manufacturing lines is determined by market demand, making it difficult to give a proportion at the present time. During implementation, the Government will continue to encourage enterprises to adopt low-GWP alternative technologies through TA activities and policy measures. UNDP also explained that the overarching strategy is based on three strategies that are complementary and should not be dissociated: policy enforcement of the consumption quota and other policy measures as required to support the phase-out; TA activities geared to technology application, technical and financial demonstration, and the removal of barriers for upscaling with co-financing from companies; and management and monitoring including strengthening the management capacity of local EEBs, issuing relevant standards, issuing the Guidelines on the Supervision of Ozone Depleting Substances (trial basis), revising the recommended list of key HCFC alternatives, developing and revising relevant environmental green labels, green environmental products and Government procurement catalogues, and developing policy recommendations, and preparing conversion guidelines for SMEs.

Selection of alternative technology

94. The low-GWP alternative technologies selected for the funded conversions in the revised stage II were modified to include R-513A and CO₂/R-134a. The Secretariat noted that both technologies had been used for the conversion of manufacturing lines in either stage I or stage II, and therefore a certain amount of experience had been accumulated. As previously reported,¹² the selection of CO₂/HFC-134a was due to the fact that many SMEs lack the technical capacity to handle NH₃; CO₂/HFC-32 will also be explored to minimize climate impact of this option. The use of R-513A was due to the safety and viability of the technology, as HFO-1234yf has mild flammability and is not available on the market.

Technical and cost-related issues

95. For the revised extended stage II of the ICR sector plan, ICC will account for 85 per cent of the conversion cost and IOC for 15 per cent, while this ratio was 70 to 30 per cent in the original stage II. UNDP explained that this funding allocation strategy is based on the consideration that the ICR sector has multiple product types and complicated conversion processes, and the limited resources would need to be used to support the conversion in SMEs so that the ICR industry can smoothly phase out HCFCs. While recognizing that the IOC can encourage production and sales to some extent, this incentive also has limitations, as the IOC is paid for one year only and based on the previous year's production, not considering the increased demand for products over time. The market promotion of alternative technology is a long-term process; the production and sales of equipment with alternative technology depend more on end-user acceptance of the technology, which is why enhanced TA and policy measures have been planned to promote market penetration.

96. The overall CE of the revised extended stage II is US \$2.15/kg as compared to the US \$10.10/kg in the original stage II; while the CE of the conversions to low-GWP technologies is US \$12.57/kg as compared to US \$11.52/kg. UNDP explained that the revised stage II maintained the same CE as stage I for SMEs with consumption below 20 mt, and decreased the CE for enterprises with consumption above 20 mt. The CE for conversion projects in the revised stage II is slightly higher than the original approved stage II because more consumption will be phased out by SMEs.

¹² Paragraph 143 to 145 of document UNEP/OzL.Pro/ExCom/80/37 for R-513A and paragraph 89 to 92 of document UNEP/OzL.Pro/ExCom/83/22 for CO₂/HFC-134a.

Status of implementation of stage II of the ICR sector plan

97. Upon an enquiry on the operational status of the four completed lines, UNDP reported that one manufacturing line has started to produce R-290-based water chillers (various capacity between 275 kw to 3,895 kw); the other three lines were only completed in late 2019. The exact quantities produced by the completed lines are to be verified. A total of 670 mt of HCFC-22 have been eliminated through the conversion of the four lines (590 mt to R-290 and 83.73 mt to HFC-32). UNDP further reported that, after the completion of the demonstration project at Snowman, one manufacturing line has been converted and 25 ammonia compressors have been produced and sold to downstream users.

Revision of the Agreement

98. The Secretariat noted that the condition on the alternative technologies in ICR sector in paragraph 2 of Appendix 8-A of the Agreement between the Government of China and the Executive Committee has been modified. UNDP explained that, this is in line with decision 84/69 as the Committee has requested, *inter alia*, the submission of 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 ICR sector. The modification of Appendix 8-A is necessitated by the substantial reduction of the sector plan funding level and the additional phase-out tonnages to be achieved in the period of 2021-2026.

Impact on the climate

99. The conversion of the 31 manufacturing lines to various low-GWP technologies will avoid the emission to the atmosphere of some 2.86 million tonnes of CO₂ equivalent per year. In addition, the revised stage II proposes to phase out 13,245.28 mt at ICR enterprises without assistance from the Fund. Although the technologies selected for phase-out by the enterprises that are not receiving funding are not known at this moment, TA and awareness-raising activities have been planned to promote low-GWP technologies in those conversions and are expected to reduce the climate impact to the extent possible.

Recommendation

100. The Executive Committee may wish to:

- (a) Approve the revised plan of action to extend through 2026 stage II of the industrial and commercial refrigeration and air-conditioning (ICR) sector plan, and the maximum allowable sectoral consumption levels of HCFCs as described in document UNEP/OzL.Pro/ExCom/86/21/Add.1; and
- (b) Note that under stage II of the ICR sector plan, the Government of China agreed:
 - (i) That a maximum quantity of 1,463 metric tonnes (mt) in the unitary air-conditioning (UAC) sub-sector could be converted to HFC-32;
 - (ii) That China would have flexibility to convert to alternatives with a lower global-warming potential (GWP) than HFC-32 as long as the cost and tonnage to be phased out remained the same;
 - (iii) That China would have flexibility to convert industrial and commercial heat pump water heater (HPWH) lines to HFC-32 on the understanding that UAC, water chiller (heat pump) and industrial and commercial HPWH conversions to HFC-32 combined would not exceed 1,463 mt;

- (iv) That at least 30 per cent of the total phase-out of HCFC-22 from 2021-2026 funded by the Multilateral Fund in the ICR sector would be from the conversion of small- and medium-sized enterprises (i.e. those consuming 50 mt or less); and
- (v) That, in sectors other than the UAC sub-sector, China would have flexibility to select from among the low-GWP technologies identified in Table 3 of paragraph 71 of document UNEP/OzL.Pro/ExCom/86/21/Add.1, excluding HFC-32, and would make best efforts to ensure that the tonnage remained within 30 per cent of the amount specified for each technology in that table, at no additional cost to the Multilateral Fund, and that any deviation from that range would be reported to the Executive Committee for its consideration.

REVISED EXTENDED ROOM AIR-CONDITIONING MANUFACTURING AND HEAT PUMP WATER HEATERS SECTOR PLAN (UNIDO, Austria, Italy)

Sector plan description

Background

101. At its 77th meeting, the Executive Committee approved the room air-conditioning manufacturing (RAC) and heat pump water heaters (HPWH) sector plan (RAC sector plan) of stage II of the HCFC phase-out management plan (HPMP) for China, to achieve by 2020, a 45 per cent reduction in relation to the 2013 maximum allowable consumption in the sector, in the amount of US \$89,144,797 of the total amount approved in principle for stage II of the HPMP, plus agency support costs for UNIDO and the Government of Italy, on the understanding that the Government of China agreed to convert at least:

- (a) Twenty RAC equipment manufacturing lines to R-290;
- (b) Three compressor manufacturing lines to R-290;
- (c) Three HPWH manufacturing lines to R-290; and
- (d) Two HPWH manufacturing lines to R-744.

102. The total HCFC-22 consumption that would be phased out through the implementation of stage II of the RAC sector plan amounted to 18,675 mt, of which 8,170 mt would be converted to low-global-warming potential (GWP) refrigerants (i.e., 8,122 mt to R-290 and 48 mt to R-744); funding to phase out the remaining 10,505 mt was not requested, which could convert to R-410A or other alternatives.

103. The second tranche of the RAC sector plan of stage II of the HPMP, and the corresponding 2018-2020 tranche implementation plan, was approved at the 81st meeting.

Submission for the 86th meeting

104. In line with decision 84/69(a)(iii), UNIDO, on behalf of the Government of China, submitted a revised plan of action to extend through 2026 stage II of the RAC sector plan¹³ at a cost of US \$60,394,081, plus agency support costs of US \$4,091,653 for UNIDO, US \$108,108 for the Government of Italy, and US \$125,000 for the Government of Austria,¹⁴ as originally submitted; and the maximum allowable sectoral consumption levels of HCFC as described in row 1.3.4 of Appendix 2-A of the Agreement with the Executive Committee. The implementation of stage II of the RAC sector plan will assist China in meeting

¹³ As per the letter of 7 September 2020 from the Ministry of Ecology and Environment of China to UNIDO.

¹⁴ Inclusive of US \$31,562,981, plus US \$2,066,976 for UNIDO and US \$108,108 for the Government of Italy, already approved at the 77th and the 81st meetings.

the Montreal Protocol compliance targets of 67.5 per cent reduction by 2025.

105. In line with the draft revised Agreement submitted by UNDP to the present meeting, no funding was being requested to the present meeting. The next tranche of the stage II of the RAC sector plan of US \$4,500,000, plus agency support costs of US \$290,500 for UNIDO and US \$41,833 for the Government of Austria, would be submitted to the second meeting of 2021.

106. Under the revised extended plan of action, the total number of RAC manufacturing lines to be converted to R-290 under stage II was reduced from twenty to ten; the number of compressor manufacturing lines to be converted to R-290 increased from three 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. Those changes are reflected in Appendix 8-A of the draft revised Agreement submitted to the present meeting in line with decision 84/69(a)(vii).

Progress of the implementation of stage II of the RAC sector

107. As of September 2020, 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 and the manufacturing of over 5.4 million R-290-based compressors, as shown in Table 1. 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

Name	Production (units)	Consumption (mt)	ICC (US \$)	Disbursement (US \$)
RAC enterprises				
Changhong Zhongshan	82,536	83.36	1,352,355	405,707
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	405,707
Yangzi Chuzhou	294,454	322.11	1,340,805	402,242
Total	2,295,112	2,221.12	6,545,790	1,963,739
Compressor enterprises				
GMCC*	1,384,268		861,490*	258,447
Highly	891,288		924,479	277,344
Shenyang Sanyo**	1,465,635		969,136**	290,741
Xi'an Qing'an	1,682,250		1,744,895	523,469
Total	5,423,441		4,500,000	1,350,001

* 40 per cent non-Article 5 ownership, which is reflected in the incremental capital costs (ICCs)

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

108. Of thirteen research and development (R&D) projects for the introduction of the R-290 technology, with an associated budget of US \$3,393,142, five contracts had been signed, bidding for two contracts had been issued, and bidding for six contracts was to be initiated; at the time of finalization of the present document, disbursements against the signed contracts was in process. An additional US \$723,733 is allocated for still-to-be determined TA activities to facilitate the market uptake of R-290 RAC equipment. A contract to undertake the independent verification was signed for US \$132,171; the first disbursement against that signed contract is expected by 31 December 2020.

109. The China Household Electrical Appliance Association (CHEAA) continued to provide assistance for the implementation of the RAC sector plan; US \$140,656 was disbursed to CHEAA and the consultant firm that verified the baseline consumption of the five manufacturing lines. Of the US \$1,644,556 allocated to the project implementation and monitoring unit (PMU) under the first two tranches, US \$493,367 was disbursed.

110. As of September 2020, of the US \$31,562,981 so far approved, US \$3,454,396 (11 per cent) had been disbursed to the final beneficiaries, as shown in Table 2.

Table 2. Level of disbursement in the first two tranches

Particulars		Tranche 1	Tranche 2	Total
Funds approved		15,562,981	16,000,000	31,562,981
Disbursement from UNIDO to FECO	Amount (US \$)	4,309,022	4,624,436	8,933,458
	Disbursement ratio (%)	28	29	28
Disbursement from FECO to beneficiaries*	Amount (US \$)	3,454,396	0	3,454,396
	Disbursement ratio (%)	22	0	11

* FECO does not include disbursement related to the PMU in its reporting of disbursement to final beneficiaries

Revised extended plan of action

111. Stage II would continue to be implemented through a combination of conversion of manufacturing lines; regulatory actions; technical assistance (TA) activities; and implementation and monitoring.

Conversion of manufacturing lines

112. Under the first two tranches of stage II (2016-2021),¹⁵ a total of five RAC manufacturing lines with an associated consumption of 2,221.12 mt (122.16 ODP tonnes) of HCFC-22 will be converted to R-290. An additional 23,924 mt (1,315.82 ODP tonnes) of HCFC-22 will be phased out without funding from the Multilateral Fund in 2016-2021.¹⁶

113. In 2022-2026, a further 2,085 mt (114.68 ODP tonnes) of HCFC-22 will be phased out through the conversion of an additional 5 RAC manufacturing lines and three HPWH manufacturing lines to R-290. An additional 16,590 mt (912.45 ODP tonnes) of HCFC-22 will be phased out without funding from the Multilateral Fund, as summarized in Table 3.

Table 3. Manufacturing line conversions and associated phase-out of HCFC-22 (mt) under stage II

Particulars	2016-2021	2022-2026	Total
Funded			
5 RAC manufacturing lines to R-290	2,221	0	2,221
5 additional RAC manufacturing lines to R-290	0	2,013	2,013
3 HPWH manufacturing lines to R-290	0	72	72
Sub-total (mt)	2,221	2,085	4,306
Not funded	23,924	16,590	33,044
Total (mt)	26,145	18,675	44,820

114. For conversions between 2022-2026, ICCs to convert a RAC manufacturing line with a capacity of 350,000 units/year line to R-290 was estimated at US \$1,421,807, and US \$302,750 to convert a HPWH manufacturing line with a capacity of 20,000 units/year, resulting in a total ICC of US \$8,017,285 for those years. IOCs of conversion of RAC and HPWH production lines were requested at US \$6.30/kg, in line with decision 74/50(c)(viii), for a total of US \$13,135,500.

¹⁵ At a total funding level of US \$31,562,981, plus US \$2,066,976 for UNIDO and US \$108,108 for the Government of Italy, already approved at the 77th and the 81st meetings.

¹⁶ At the 77th meeting, the Government of China had agreed to phase-out 10,505 mt of HCFC-22 without funding from the Multilateral Fund in 2016-2021.

Regulatory actions in 2022-2026

115. The regulatory component will support the conversion of RAC and HPWH production lines and will include improvement of the quota management system; revision of RAC energy efficiency standards and other existing standards, and development of a new technical standard on CO₂; establishment of financial incentives and mechanisms to encourage the application of environmentally friendly alternatives; and establishment of public green procurement.

TA activities in 2022-2026

116. The following four TA activities have been proposed for 2022-2026 to increase the market share of R-290 RAC technology at a total cost of US \$2,740,000: promotion of the R-290 eco-label (US \$100,000); establish a mechanism to increase the sale of R-290 RAC equipment (US \$620,000); a pilot installation of 10,000 R-290 RAC units (US \$650,000) and data collection and analysis (US \$120,000); capacity-building on the safety certificate for R-290 RAC equipment (US \$200,000); and promote the uptake of R-290 RAC equipment outside China (Government of Austria, US \$1,050,000).

117. Additional TA activities, at a total cost of US \$2,862,476, include: R&D on using R-290 technology (US \$1,310,000); further development of standards related to the use of R-290 technology (US \$596,000); public awareness (US \$447,476), verification of milestones of conversion projects (US \$341,000), and tracing the progress on the phase-out of HCFC-22 (US \$168,000).

118. In addition, the PMU established under stage II would continue to monitor and implement the project (US \$1,585,710). A total of US \$490,129 was allocated to CHEAA to continue to provide assistance related to the technical and financial aspects of the implementation of the RAC sector plan.

Total cost of stage II of the RAC sector plan of the HPMP

119. The total cost of the stage II of the RAC sector plan is US \$60,394,081, plus agency support costs, and including US \$31,562,981, plus agency support costs, already approved at the 77th and 81st meetings. Stage II will phase-out 44,802 mt (2,465.11 ODP tonnes) of HCFC-22, of which 40,514 mt (2,228.27 ODP tonnes) will be converted without assistance from the Multilateral Fund. The overall cost effectiveness (CE) is US \$1.35/kg (or US \$14.03/kg based on only the phase-out of 4,036 mt for which funding is requested). Table 4 presents the summary of activities and associated costs of stage II of the RAC sector plan.

Table 4. Summary of activities and cost of stage II of the RAC sector plan (2016-2026)

Component	HCFC-22 (mt)	CE (US \$/kg)	Cost (US \$)
2016 – 2021			
Conversion of 5 RAC manufacturing lines	2,221		
ICC		2.95	6,545,790
IOC		6.30	13,992,300
Conversion of 4 compressor manufacturing lines to R-290	0	n/a	4,500,000
Thirteen R&D projects	0	n/a	3,393,171
Additional TA	0	n/a	723,733
Independent verification of milestones of conversion projects	0	n/a	132,171
CHEAA	0	n/a	631,260
PMU	0	n/a	1,644,556
Sub-total	2,221	14.21	31,562,981
Phase-out without funding from the Multilateral Fund	23,924	0	0
Sub-total (2016-2021)	26,145	1.21	31,562,981
2022 – 2026			
Conversion of additional 5 RAC manufacturing lines			
ICC		3.53	7,109,035
IOC		6.30	12,681,900

Component	HCFC-22 (mt)	CE (US \$/kg)	Cost (US \$)
Conversion of 3 HPWH to R-290	72		
ICC		12.61	908,250
IOC		6.30	453,600
Four TA activities to increase market share of R-290 RAC technology	0	n/a	2,740,000
TA for R&D	0	n/a	1,310,000
TA on standards	0	n/a	596,000
Public awareness	0	n/a	447,476
Independent verification of milestones of conversion projects	0	n/a	341,000
Monitoring progress on HCFC-22 phase-out	0	n/a	168,000
CHEAA	0	n/a	490,129
PMU	0	n/a	1,585,710
Sub-total	2,085	13.83	28,831,100
Phase-out without funding from the Multilateral Fund	16,590	0	0
Sub-total (2022-2026)	18,675	1.54	28,831,100
Total funded phase-out (2016-2021)	4,306	14.03	60,394,081
Total (2016-2026)	44,820	1.35	60,394,081

120. With the implementation of stage II of the RAC sector plan, the Government of China would reduce HCFC-22 consumption in the RAC manufacturing sector by 45 per cent by 2022, 61 per cent by 2023, and 70 per cent by 2025, relative to the 2013 consumption in the sector, as shown in Table 5.

Table 5. Maximum allowable sectoral consumption for the extended RAC sector plan (2022-2026)

Particulars	2022	2023	2024	2025	2026
Maximum allowable consumption of Annex C, Group I substances in the RAC sector (ODP tonnes)	2,259.7	1,614.1	1,614.1	1,232.6	1,232.6
Reduction relative to 2013 sector consumption (%)	45	61	61	70	70

Secretariat's comments

Impact of COVID-19

121. Due to the COVID-19 pandemic, enterprises have not been able to normally operate their business in 2020, and both domestic and foreign markets continued to be seriously affected.

122. Three of the enterprises (RAC manufacturers Changhong Zhongshan and TCL Zhongshan, and compressor manufacturer GMCC) have been visited and had their second and third milestones verified; those projects are expected to be completed by December 2020; if travel restrictions due to COVID-19 are re-imposed, national acceptance could be undertaken virtually. Conversion of three other enterprises (RAC manufacturer TCL Wuhan and compressor manufacturers Highly and Shenyang Sanyo) are expected to be completed by December 2021. However, the three smaller enterprises (RAC manufacturers Hinsense Jiangmen and Yangzi Chuzhou, and compressor manufacturer Xi'an Qing'an) suffered supply chain interruptions and shrinking market demand; conversions at those enterprises have temporarily halted and, at the time of finalization of the present document, it was unclear when implementation of those conversions would resume.

123. The most significant impact of the COVID-19 pandemic is likely on the economy both in and outside of China, which is expected to play a key role in the willingness of consumers to invest in a new technology such as R-290 in the RAC sector. Depending on travel and other restrictions, some activities may need to be adjusted or delayed; mechanisms are in place to do so. For example, the annual conference on alternative technologies in the RAC sector organized by the CHEAA will be held on 30 October 2020; participation in that meeting is available both in person and virtually. Similarly, national acceptance may be undertaken virtually.

Strategy and sustainability

124. The principal focus under stage I and the first two tranches of stage II of the RAC sector plan was the conversion of RAC manufacturing lines and provision of IOCs. The focus of activities for 2022-2026 has shifted to TA to promote R-290 RAC technology and its marketization.

125. Notwithstanding best efforts by the Government of China, UNIDO, CHEAA, industry and other stakeholders, and the development of an innovative IOC incentive mechanism, market uptake of R-290 RAC equipment has been limited, as evidenced by the fact that only approximately 1 per cent of the manufacturing capacity that was converted to R-290 under stage I was used between 1 September 2019 and 31 August 2020.

126. By the end of stage II, the manufacturing capacity converted to R-290 would constitute approximately 4 per cent of the country's total RAC manufacturing capacity.¹⁷ Given the predominant market share of other technologies, it is likely that the market uptake of R-290 RAC equipment will remain challenging. Policy measures in China, as well as in countries that import RAC equipment from China, will be critical in ensuring the successful uptake of the technology.

127. Funding was not requested for approximately 90 per cent of the phase-out to be achieved between 2016 and 2026; that phase-out may be achieved through conversions to any non-ODS technology, including R-410A and HFC-32. While the Government intends to encourage the conversion of additional manufacturing lines to R-290, the selection of technology depends on customer demand and a substantial portion of RACs made in China are exported; accordingly, it is difficult to estimate the technology segregation of the phase-out for which funding was not requested.

128. Market acceptance of R-290 RAC equipment is challenged by a number of factors, including competition from RAC equipment based on R-410A and HFC-32 refrigerants. Consumption of R-410A for RAC manufacturing has been roughly constant at approximately 60,000 mt/year between 2015-2019. In contrast, consumption of HFC-32 for RAC manufacturing has increased substantially, growing 90 per cent between 2017 and 2019, to approximately 40,000 mt/year.¹⁸ The increase in HFC-32 RAC manufacturing is taking place notwithstanding that there is very little difference in the price of HFC-32- and R-410A-based RAC units.

129. It had also been reported¹⁹ that a challenge in the market uptake of R-290 RAC equipment was the higher costs to install the equipment relative to other equipment. Notwithstanding that RAC installation standards in China do not distinguish between A2L (e.g., HFC-32) and A3 (e.g., R-290) refrigerants, manufacturing of HFC-32-based RAC has grown substantially while that of R-290-based RAC has not. In theory, installation requirements for HFC-32 and R-290-based RAC should be the same; in practice, it appears that technicians are more careful dealing with R-290, which reduces the efficiency of installation.

130. Under the revised extended sector plan, the Government of Austria would provide TA in the identification of market barriers to R-290 technology in countries outside China, with an initial focus on countries in North Africa and the Balkans, and means to overcome those, such as minimum infrastructure requirements, including skills/training, in order to safely install and maintain R-290 products. None of the

¹⁷ The annual capacity of the 18 RAC manufacturing lines converted to R-290 under stage I is 6,738,455 units/year. By the end of stage II, an additional ten manufacturing lines would be converted to R-290, bringing the total R-290 manufacturing capacity to approximately 10 million units/year. In 2019, China's RAC manufacturing capacity was approximately 154 million units/year; by 2026, that capacity would be approximately 232 million units/year, assuming continued growth at approximately 6 per cent/year.

¹⁸ In line with paragraph 17 of decision XXVIII/2, any R-410A and HFC-32 RAC manufacturing capacity established after the cut-off date for eligible capacity of 1 January 2020 would not be eligible for funding under an HFC phase-down.

¹⁹ Paragraph 205 of UNEP/OzL.Pro/ExCom/80/59.

R-290 RAC split units manufactured under stage I had been exported. Accordingly, the Secretariat considers the inclusion of activities to promote the market uptake of R-290 RAC equipment outside China to be strategic, while noting that details on those activities will be included as part of the third tranche of the sector plan to be submitted to the second meeting in 2021. The Secretariat notes that the Balkans include both Article 5 and non-Article 5 countries; only activities in the former would be eligible under the Multilateral Fund.

131. The revised extended plan does not include further conversion of compressor lines to R-290 in 2022-2026. Under stage I, three compressor lines were converted; a further four lines were converted under the first two tranches of stage II, bringing the total number of compressor lines converted to R-290 to seven. Given that the market uptake of the technology is likely to continue to be constrained, the Secretariat considers that there would be sufficient R-290 compressor manufacturing capacity through the end of stage II.

Cost-related issues

132. At its 77th meeting, the Committee approved, in principle, the RAC sector plan of stage II of the HPMP for China for the period 2016 to 2021 in the amount of US \$89,144,797, plus agency support costs. Of the 18,675 mt to be phased out under that plan, 8,122 mt were to be phased out by converting R-290 and 48 mt to R-744. Thus, the CE of the conversions to low-GWP alternatives between 2016 and 2021 was US \$10.91/kg. Under the revised extended plan, US \$28,831,100 is requested to phase out 2,085 mt of HCFC-22 to R-290 between 2022 and 2026, resulting in a CE of US \$13.83/kg. This higher CE is due to higher allocation of funding to IOCs and TA activities; moreover, the revised extended RAC sector plan includes a substantial increase in phase-out for which funding is not requested. In addition, the average ICC to convert a RAC manufacturing line between 2016-2021 was US \$1,309,158 (i.e., US \$112,649 less per line than allocated in 2022-2026) and those lines had a higher average manufacturing capacity (459,022 units/year) than in 2022-2026 (350,000 units/year).

133. A total of US \$7,109,035 is allocated to convert five additional RAC manufacturing lines to R-290, and US \$908,250 to convert three HPWH manufacturing lines to R-290 between 2022-2026. In line with past practice, the manufacturing lines will be selected through voluntary application by enterprises to the programme, and the qualification of the applicant and manufacturing line will be verified by MEE/FECO. At the 76th meeting, it was noted that the average Article 5 ownership of RAC manufacturing enterprises was 76 per cent. Some enterprises that may wish to participate in the conversions supported under the extended RAC sector plan may include non-Article 5 ownership, which is not eligible for funding. In such cases, the Secretariat proposed that the Government of China, through UNIDO, inform the Executive Committee of the non-Article 5 ownership of any RAC manufacturing lines wishing to participate under the extended RAC sector plan, and to propose for the Executive Committee's consideration either a reallocation of those funds associated with the non-Article 5 ownership for other activities under the extended RAC sector plan, or to return the funds to the Multilateral Fund.

IOCs

134. In addition to policy measures in China and in countries that import RAC equipment from China, the IOC incentive scheme can continue to play a helpful role in facilitating the uptake of the technology. As noted at the 84th meeting, it would be necessary to ensure that any IOCs to be provided under stage II do not exceed those under stage I.²⁰ The Secretariat suggested that a similar IOC incentive scheme be used under stage II as under stage I, whereby IOCs would be based on whether or not the equipment was sold domestically or exported to Article 5 parties²¹ and, if the former, the energy efficiency grade of the equipment sold; and that IOCs gradually decrease with time to incentivize the early uptake of the technology.

²⁰ Paragraph 62 of document UNEP/OzL.Pro/ExCom/84/42.

²¹ IOCs would not be provided for R-290 RAC equipment sold to non-Article 5 countries.

In particular, the Secretariat proposed that IOCs under stage II be maintained at the same level as under stage I for R-290 split units sold between 1 September 2021 and 31 December 2022, at which time the IOCs would be further reduced under a revised IOC incentive mechanism included in the third tranche request submitted to the last meeting of 2021. However, the Government wished to have flexibility to decide when to reduce the IOCs based on the progress of market reaction to R290. The Executive Committee may wish to consider the appropriate level of IOCs when additional information on the market uptake of the technology is provided as part of the request for the third tranche of the revised extended RAC sector plan.

135. The agreed allocation for IOCs under stage II of the RAC sector plan was US \$33,648,412.²² Based on a (funded) phase-out of 8,170 mt, the agreed level of IOCs was US \$4.12/kg. The Secretariat proposed this agreed level continue to be considered the overall maximum IOC of stage II. Accordingly, a minimum of 2,773,360 R-290 RAC units would need to be sold between 2022 and 2026 for the additional US \$13,135,500 of IOCs to be disbursed. UNIDO noted, however, that it was difficult for industry to commit to a specified number of sales as the IOC incentive scheme would be based on the number of units sold, energy efficiency of those units, and whether those units were sold domestically or exported to Article 5 countries. The Executive Committee may wish to provide guidance on whether or not a minimum number of R-290 RAC units would need to be sold based on information provided on the market uptake of R-290 RAC technology when the third tranche of the revised extended RAC sector plan was submitted.

136. A total of US \$650,000 is allocated for a pilot installation of 10,000 R-290 AC units; this activity would effectively subsidize each R-290 RAC unit by US \$65, a level well above the current IOC incentive scheme. UNIDO clarified that, to date, R-290 RAC units have been installed in non-residential buildings (e.g., public facilities, office buildings, schools or factory dormitories); the pilot installation would target residential buildings to ensure the technology is accepted by individual household buyers. Each RAC unit will include a WIFI module to enable operation monitoring and data collection. On that basis, it was agreed that the 10,000 units in the pilot installation would not be included in the IOC incentive scheme.

Impact on the climate

137. The conversion of the 10 RAC manufacturing lines to R-290 would avoid the emission to the atmosphere of some 12.9 million tonnes of CO₂ equivalent per year. The conversion of three residential HPWH lines to R-290 is estimated to avoid the emission to the atmosphere of an additional 229 tonnes of CO₂ equivalent per year. In addition, China is proposing to phase out 40,514 mt of HCFC-22 at RAC enterprises without assistance from the Fund. Those conversions would increase the emissions to the atmosphere by approximately 507 thousand tonnes of CO₂ equivalent per year if the alternate technology is R-410A; and would avoid the emissions to the atmosphere of approximately 150 million tonnes of CO₂ equivalent per year if the technology is HFC-32. If approximately half of the unfunded conversions are to R-410A and the other half to HFC-32, then approximately 75 million tonnes of CO₂ equivalent per year would be avoided; and approximately 107 million tonnes of CO₂ equivalent per year would be avoided if those conversions are equally split among R-290, R-410A, and HFC-32.

Recommendation

138. The Executive Committee may wish to:

- (a) Approve the revised plan of action to extend through 2026 stage II of the room air-conditioning manufacturing (RAC) and heat pump water heaters (HPWH) sector plan (RAC sector plan), and the maximum allowable sectoral consumption levels of HCFC as described in document UNEP/OzL.Pro/ExCom/86/21/Add.1;

²² Paragraph 100 and Table 2 of UNEP/OzL.Pro/ExCom/81/29.

- (b) Note that under stage II of the RAC sector plan, the Government of China agreed to convert at least:
 - (i) Ten manufacturing lines for the production of RAC equipment to R-290;
 - (ii) Four compressor manufacturing lines to R-290; and
 - (iii) Three residential HPWH manufacturing lines to R-290;
- (c) Request UNIDO to include in the request for the third tranche of the extended RAC sector plan to be submitted to the last meeting of 2021 information on the level of sales of R-290 RAC split units; and
- (d) Note that the Government of China, through UNIDO, would inform the Executive Committee of the non-Article 5 ownership of any RAC manufacturing lines wishing to participate under the extended RAC sector plan, and to propose either a reallocation of those funds associated with the non-Article 5 ownership for other activities under the extended RAC sector plan, or to return the funds to the Multilateral Fund.

REVISED EXTENDED REFRIGERATION SERVICING SECTOR PLAN AND NATIONAL ENABLING PROGRAMME (UNEP, Germany, Japan)

Sector plan description

Background

139. At its 76th meeting, the Executive Committee approved in principle the refrigeration servicing sector plan and national enabling programme of stage II of the HPMP for China to achieve by 2026, 67.5 per cent reduction of HCFCs in that sector, in the amount of US \$20.9 million, plus agency support costs of US \$2,087,900 for UNEP, US \$120,000 for the Government of Germany and US \$52,000 for the Government of Japan.

140. The second tranche for the refrigeration servicing sector and national enabling programme was approved at the 81st meeting, with the corresponding 2018-2020 tranche implementation plan. At its 82nd meeting, the Committee noted the request from the Government of China for the third tranche of the refrigeration servicing sector and national enabling programme sector plan and decided to defer consideration to the 83rd meeting (decision 82/71(b)); at which meeting a decision was made to further defer consideration of the third tranche to the 84th meeting (decision 83/55).

141. The third tranche of the refrigeration servicing sector and national enabling programme sector plan of stage II of the HPMP for China, and the corresponding 2020-2021 tranche implementation plan was approved in the amount of US \$1,000,000, plus agency support costs of US \$120,000 at the 84th meeting.

Revised extended plan of action

142. In line with decision 84/69(a)(iii), UNEP, on behalf of the Government of China, submitted a revised extended plan of action to extend through 2026 stage II of refrigeration servicing sector and national enabling programme sector plan at a cost of US \$11,675,105, plus agency support costs of US \$1,342,282 for UNEP, US \$820,000 for the Government of Germany, and US \$240,000 for the Government of Japan²³; and the maximum allowable sectoral consumption levels of HCFC as described in row 1.3.4. The implementation

²³ As per the letter of 7 September 2020 from the Ministry of Ecology and Environment of China to UNEP.

of stage II²⁴ will assist China in meeting the Montreal Protocol compliance targets of 67.5 per cent reduction by 2025.

143. In line with the draft revised Agreement submitted by UNDP to the 86th meeting, the next tranche of stage II of the refrigeration servicing sector and national enabling programme sector plan, amounting to US \$2,500,000, plus agency support costs of US \$2,000,000 (breakdown by agency as in previous cases) for UNEP, the Government of Germany and the Government of Japan will be submitted to the second meeting of 2021.

HCFC consumption in the refrigeration servicing sector

144. The consumption of HCFCs in the servicing sector in 2019 was 59,357.39 mt (3,259.7 ODP tonnes) of HCFC-22 as shown in Table 1. There is no maximum allowable consumption for the refrigeration servicing sector in the Agreement. The overall total consumption of HCFC in 2019 in China.

Table 1. HCFC consumption in the servicing sector in China (2015-2019 country programme data)

HCFC	2015	2016	2017	2018	2019	Average*
Metric tonnes						
HCFC-22	42,557.47	47,398.35	51,482.65	59,821.81	58,005.55	64,466.58
HCFC-123	314.91	288.14	347.29	437.57	404.58	113.75
HCFC-124	(46.320)	67.16	(5.71)	(5.32)	37.71	139.56
HCFC-142b	1,016.42	371.44	662.43	276.97	909.55	5,338.58
Total (mt)	43,842.48	48,125.09	52,486.66	60,531.03	59,357.39	70,058.47
ODP tonnes						
HCFC-22	2,340.66	2,606.91	2,831.55	3,290.20	3,190.31	3,545.68
HCFC-123	6.30	5.76	6.95	8.75	8.09	2.30
HCFC-124	(1.02)	1.48	(0.13)	(0.12)	0.75	3.05
HCFC-142b	66.07	24.14	43.06	18.00	59.12	347.03
Total (ODP tonnes)	2,412.01	2,638.29	2,881.42	3,316.83	3,258.27	3,898.06

* Average consumption in 2009 and 2010.

145. While there has been an increasing trend since 2016, the consumption in 2019 was below the maximum allowable level of consumption in the Agreement between the Government of China and the Executive Committee. The overall decrease in HCFC consumption is attributed to 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; and progress in the conversion for the room air-conditioning manufacturing and heat pump water heaters (RAC) and industrial and commercial refrigeration and air conditioning (ICR) manufacturing sectors resulting in a higher number of HCFC-free products entering the local market. The market share of refrigeration and air-conditioning equipment based on HFC-32 and R-410A with inverters has increased dramatically in China.

HCFC consumption targets

146. The HCFC consumption targets of the refrigeration servicing sector are shown in Table 2.

²⁴ According to China's submission, this will be considered as the revised HPMP stage II to differentiate it from the original stage II for the sector where funds had been approved until 2020 (i.e., at the 77th and 81st meetings, respectively).

Table 2. HCFC phase-out targets for the refrigeration servicing sector in China

Maximum consumption	2021	2022	2023	2024	2025	2026
ODP tonnes	3,000	3,000	3,000	3,000	2,500	2,500
Metric tonnes	54,460	54,460	54,460	54,460	45,452	45,452

General principles of stage II HPMP (2021-2026)

147. Stage II (2021-2026) includes two components: the HCFC phase-out actions in refrigeration servicing sector, and capacity building activities as enabling components. The core of the enabling component is to build capacity at the national and local levels to strengthen the communication and coordination mechanism of relevant departments associated with the HPMP implementation, ensure the continuous implementation of policies and regulations on controlled substances, and increase monitoring and reporting of imports and exports of controlled substances, particularly illegal activities.

148. The policy studies, revision of standards and codes, technicians training, certification, outreach and other activities included in the refrigeration servicing sector plan are planned to support the phase-out in the RAC and ICR manufacturing sectors. These activities are aiming to enhance the ability of the servicing sector to phase out HCFC consumption, and strengthen the capacity of technicians for the safe handling of refrigerants, and improve the management of servicing workshops by enhancing the skills of servicing technicians and reducing refrigerant consumption through good servicing practice.

Components of the revised extended plan of action

149. The following refrigeration servicing activities, at a total cost of US \$5,846,105, will be implemented:

- (a) Policy studies and policy development including the identification of new pilot cities to continue enhancement of the capacity of local Ecology and Environment Bureaus (EEBs) for management and monitoring of the activities in the refrigeration servicing sector (US \$1,256,105);
- (b) Updating and development of new standards and codes for the refrigeration servicing sector focusing on diverse equipment and for different applications (i.e., RAC and ICR) (US \$240,000);
- (c) Continue training programmes for refrigeration technicians, supported by the development of new training materials and establishment of additional training centres, strengthening training through manufacturers after sales systems for the RAC and ICR sectors; capacity building at international training institutions for selected trainers from training centres supporting the certification programme (US \$3,100,000);
- (d) Optimize and broaden the qualification certification training for refrigeration servicing technicians to fit the needs of the market and the requirements of the restructured national certification system (US \$140,000); and
- (e) Outreach activities to disseminate information on good refrigeration service practices and on ozone-climate initiatives to enhance awareness on protecting the ozone layer and the climate through Ozone2Climate events, and training for technicians of the supermarket sector (US \$1,110,000).

150. The national enabling programme activities, at a cost of US \$5,790,000, will ensure that local authorities have the capacity to implement relevant laws and regulations to encourage HCFC phase-out; strengthen the capacity of law enforcement to manage ODS import/export; prevent and combat illegal trade of HCFCs; facilitate the adoption of alternative refrigerants; encourage better procurement practices through public awareness campaigns; and increase public awareness on ozone protection and its relation to climate change. The following will be implemented:

- (a) Build capacity for local authorities at the national and local level through meetings to improve communication with EEBs, and supervision and enforcement training (US \$2,580,000);
- (b) Continue to strengthen the HCFC import/export management system through training workshops for customs officers; and capacity building assistance for customs districts including *inter alia* training on refrigerant identification and risk analysis; establishing a law enforcement cooperation centre to monitor and sanction illegal trade; improve the ODS import and export online approval system; evaluation and improvement of inspection operations in eight major Customs ports; and build capacity of law enforcement and customs to combat illegal ODS trade targeting specific provinces with the objective to establish a coordination mechanism between different departments for more efficient reporting and supervision (US \$2,460,000); and
- (c) Develop a communication and outreach strategy which will include events for International Ozone Day; development of new outreach materials aligned with the objectives and activities of the various sector plans; conduct public awareness workshops related to the protection of the ozone layer and China's actions on phasing out HCFCs; develop and distribute awareness materials; and support website maintenance (US \$750,000);

Project implementation and monitoring unit (PMU)

151. The PMU (US \$1,081,000) will continue to be used to manage and monitor daily project implementation. PMU activities include: monitoring implementation of sub-grant agreements and technical assistance activities; preparation of progress reports; and monitoring training activities, as shown in Table 3.

Table 3. Breakdown of PMU costs

Activities	Cost (US \$)
Project management team personnel costs	371,000
Domestic/international travel	50,000
Domestic/international meetings	40,000
Cost of consultancy services	35,000
Supporting personnel cost	300,000
Computers, internet service and communications services	75,000
Office operation and maintenance, utilities	210,000
Total	1,081,000

Tranche distribution (2021-2026)

152. The tranche disbursement schedule for the years 2021 to 2026 is presented in Table 4. The tranche disbursement is in rows 2.5.1 to 2.5.6 of Appendix 2-A of the draft revised Agreement between the Government of China and the Executive Committee.

Table 4. Tranche distribution refrigeration servicing sector and national enabling programme (US \$)

Item	2021	2022	2023	2024	2025	2026	Total
Funding	2,000,000	2,000,000	2,000,000	3,000,000	1,200,000	2,517,105	12,717,105

Secretariat's comments

153. The Secretariat noted that the overall cost of stage II of the HPMP for the refrigeration servicing sector and national enabling programme sector for China was adjusted from the original approval of US \$20.9 million to US \$18,526,237; and that the Government of China, with this adjusted funding committed to meet the phase-out of HCFCs committed for the period up to 2026 in the national servicing sector and national enabling programme sector. It is expected that the remaining consumption of HCFC-22 required for servicing in 2026 will be approximately 15,000 mt.

154. It was explained that with this reduction in the funding level, stage II the activities of the refrigeration servicing sector and enabling component were reprioritized to focus on training programme, standard developing, policy studies, as well as the capacity building of local EEBs and customs. It aims to improve the technical skills of the servicing technicians, strengthening the management and supervision capacity of authorities, which will lead the reduction of HCFC consumption in the servicing sector, and ensure the achievement and sustaining of the compliance target.

155. In responding to how the funding approved at the 84th meeting of US \$1,000,000 was reflected in the revised programme, UNEP explained that this was included in activities for the period 2016-2020, while the revised plan focuses on activities that will be implemented from 2021. In order to effectively monitor the activities and the related funding, the Government of China decided to divide stage II activities into two components, one referred to as stage II (2016-2020) and revised extended stage II (2021-2026) in order to differentiate the activities and funding.

156. UNEP also provided a list of policies and standards that had been developed from the previous tranches compared to what is expected to be the focus for this revised plan in order to easily monitor those that had been completed and those in progress.

Recommendation

157. The Executive Committee may wish to approve the revised plan of action to extend through 2026 stage II of the refrigeration servicing sector and national enabling programme sector plan submitted by UNDP in line with decision 84/69(a)(iii), as described in document UNEP/OzL.Pro/ExCom/86/21/Add.1.

REVISED EXTRUDED POLYSTYRENE (XPS) FOAM SECTOR PLAN (UNIDO, Germany)

Sector plan description

Background

158. At its 77th meeting, the Executive Committee approved the extruded polystyrene (XPS) foam manufacturing sector plan of stage II of the HCFC phase-out management plan (HPMP) to achieve, by 2026, total phase-out of HCFCs in the sector, in the amount of US \$112,786,630 approved in principle, plus agency support costs for UNIDO and the Government of Germany. At that meeting, the Executive Committee also approved the first tranche of the XPS foam sector plan, and the corresponding 2017 tranche implementation plan.

159. At its 80th meeting, the Executive Committee approved the second tranche of stage II of the XPS foam sector plan and the corresponding 2018 tranche implementation plan, and at its 85th meeting, the Committee approved the third tranche and the corresponding 2020-2021 tranche implementation plan. Overall, a total of US \$26,405,298, plus agency support cost for UNIDO and the Government of Germany, has been approved so far.

160. As of June 2020, 10 XPS foam manufacturing enterprises had signed contracts with FECO for conversion to CO₂-based technology and received funding to initiate the conversions, which will be completed between 2020 and 2021, resulting in the phase-out of 4,297 metric tonnes (mt) of HCFCs.

Revised plan of action

161. In line with decision 84/69(a)(iv)b. and (v), UNIDO, as lead implementing agency for the XPS foam sector plan, has submitted on behalf of the Government of China a revised plan of action for stage II of the XPS foam sector plan, for the years 2021 to 2026, at a cost of US \$18,534,654, plus agency support costs for UNIDO and the Government of Germany.²⁵

162. Noting that between 2016 and 2020, US \$26,405,298, plus agency support costs have already been approved for the XPS foam sector plan, the revised approval in principle for the entire stage II of the XPS foam sector plan is US \$44,939,952, plus agency support costs.

163. In line with the draft revised Agreement submitted by UNDP to the 86th meeting, no funding is being requested at the 86th meeting. The next tranche of the XPS foam sector plan of US \$5,000,000, plus agency support costs of US \$308,000 for UNIDO and US \$73,535 for the Government of Germany, will be submitted to the second meeting of 2021.

HCFC consumption targets

164. The HCFC phase-out timeline for stage II of the XPS foam sector is shown in Table 1 and reflected in row 1.3.2 of Appendix 2-A of the draft revised Agreement between China and the Executive Committee in Annex II. The HCFC consumption targets for the XPS foam sector have been maintained as originally approved at the 77th meeting.

Table 1. HCFC phase-out targets for the XPS foam sector in China

Maximum allowable consumption of HCFCs in the XPS foam sector	Starting point	2016 2017	2018 2019	2020 2021 2022	2023 2024	2025	2026
Mt	43,050	39,755	35,339	24,296	13,252	3,000	0
ODP tonnes	2,540	2,286	2,032	1,397	762	165	0
Reduction (ODP tonnes)			254	635	635	597	165
Reduction from starting point (%)			20	45	70	94	100

HCFC phase-out strategy for 2021-2026

165. Stage II of the XPS foam sector plan originally estimated providing assistance to 124 enterprises to phase out 1,265 ODP tonnes of HCFCs, while the remaining HCFC consumption in the sector would be phased out by non-assisted enterprises. The revised plan sets out to directly assist a total of 21 enterprises (10 from ongoing projects from previous tranches and an additional 11 proposed in the plan of action) to phase out 466.32 ODP tonnes, while the remaining consumption would be phased out by non-assisted enterprises. The sector plan will be supported by policy, TA and a PMU.

166. Accordingly, the revised plan of action for the XPS foam sector plan will comprise four groups of activities: policy and regulatory interventions to ensure timely and sustainable phase-out of HCFCs; an investment component to assist enterprises with conversions; TA to strengthen the technical capacity of the industry and to promote the adoption of low-global-warming potential (GWP) alternatives; and project management.

²⁵ As per the letter of 7 September 2020 from the Ministry of Ecology and Environment of China to UNIDO.

Policy and regulatory interventions

167. The Government will introduce supporting policies and regulations into the existing ODS regulatory framework, in order to: ensure that the consumption of HCFCs in the XPS foam sector is reduced as scheduled; provide incentives for enterprises to phase out HCFCs and adopt environmentally friendly alternatives; promote the development and penetration of substitute technologies; ensure that the growth of the sector is not negatively affected by conversion activities; and achieve the sustainable reduction of ODS in the XPS foam sector.

168. Additional consumption control measures, to be introduced in due time, include: issuance of a ban on the use of HCFCs in the XPS foam sector from 1 January 2026; issuance of recording rules for all enterprises involved in the sale and trade of HCFCs that report to the Ecology and Environment Bureaus (EEBs); updated guidelines on technologies alternative to HCFCs; revision of the catalogue and recommendations for alternative technologies to HCFCs; and revision of the technical standards on XPS foam products to ensure performance with alternative technologies.

Investment projects

169. A total funding of US \$16,127,957 allocated to investment activities for the period 2021-2026 will be used to ensure that small and medium-sized enterprises (SMEs) can procure the main equipment of one production line and the necessary safety retrofit, and that large enterprises can procure the main equipment of one to two production lines and the necessary safety retrofit. Counterpart funding will be required to purchase auxiliary equipment and other supporting facilities.

170. In accordance with the above principles, by lowering average cost-effectiveness for individual sub-projects and encouraging enterprises to increase their co-financing, 11 individual sub-projects that have passed the financial verification will be proposed to sign the phase-out sub-contracts as the funding tranches are approved.

171. Optimized carbon dioxide (CO₂) co-blowing technology was selected for stage II of the HPMP in the XPS foam sector. The revised plan of action does not include any change of the technology selected when stage II of the HPMP was approved. XPS foam with low density, high thermal insulation, high flame retardancy and excellent physical properties will continue to be produced using CO₂ as the main blowing agent. When the thickness of the product is more than 60 mm, one or two other blowing agents with zero ODP, low GWP, low molecular weight, moderate boiling point and high solubility will be added (i.e., alcohol as the second blowing agent, and HFC-152a as the third blowing agent when needed).

TA

172. Stage II of the XPS foam sector plan will continue to carry out TA activities in the period 2021-2026, particularly at smaller enterprises, to support the uptake of technologies in conversions and to raise awareness among relevant stakeholders about HCFC phase-out, alternatives and technical options. The preliminary list of TA activities, at a cost of US \$1,387,291, and subject to review and updates in the course of implementation, is provided below:

- (a) *Monitoring, supervision and capacity-building*: conducted by FECO and the EEBs to prevent the illegal resurgence of HCFCs in main provinces and cities where XPS foam enterprises are concentrated; approval of the residual blowing agent standard by the National Standards Committee to be used as a basis for law enforcement by EEBs; training provided to EEB officers on policies and industry-related technical and safety issues (US \$270,000);
- (b) *Training and technical support*: as the XPS foam sector is dominated by SMEs with relatively limited technical and management capabilities, relevant institutions will be hired to assist SMEs in technical formulas, selection of equipment, on-site start-up technology

demonstrations, product testing, and safety adaptations, when required (US \$250,000);

- (c) *Optimization and evaluation of equipment and technologies:* research on the optimization of formulations, including the use of heat-gluing technology to resolve technical issues associated to the production of thick XPS foam and avoid the use of adhesives (classified as volatile organic compounds) by SMEs when producing thick XPS foam (US \$340,000);
- (d) *Preparation of an impact assessment for the ban on the use of HCFCs in the XPS foam sector:* preparation of the environmental, economic and social impact assessment for the Ministry of Ecology and Environment (MEE) to consider approval and issuance of the ban on the use of HCFCs in the XPS foam sector. It involves reviewing the progress in HCFC phase-out, assessing remaining usage in the sector, and identifying further measures to ensure sustainable phase-out (US \$50,000);
- (e) *Formulation and revision of technical standards:* including test method standard and product standard, the "XPS foam for foundation insulation prior to floor heating" standard will be considered for development to improve the XPS foam product in several major applications (US \$87,291);
- (f) *Performance verification:* the implementation support agency (ISA) will continue to assist FECO in providing safety, supervision, verification, acceptance and technical guidance to the sub-project at the technical level; and an independent accounting firm will check financial information during project implementation (US \$330,000);
- (g) *Study tours on technologies alternative to HCFCs:* to facilitate sharing information on policy and alternative technologies between foam enterprises, industrial associations, and research institutes and their counterparts in other countries (US \$50,000); and
- (h) *Technical consulting service:* support by technical and safety experts during the implementation of the sector plan's policies, alternative technologies, and equipment, and delivery of technical presentations at the training workshops and seminars (US \$10,000).

PMU

173. The PMU (US \$1,019,406) will continue to manage and monitor project implementation between 2021 and 2026. PMU activities include: monitoring implementation of sub-grant agreements and TA activities; organizing and participating in verifications undertaken by ISA, evaluation meetings, and project commissioning; reviewing project documents submitted by beneficiaries and processing contract performance; communicating and coordinating with implementing agencies, ISA, technical experts and other stakeholders on project implementation; designing TA activities, developing terms of reference and selecting qualified implementing agencies; and preparing work plans, progress reports and other documents as required.

174. Besides the routine management of sub-projects, the PMU will undertake more responsibilities in the area of communications and cooperation through coordination meetings with policy makers and industry to discuss HCFC phase-out progress, policy measures and actions to promote the penetration of alternative technologies; providing the MEE, local EEBs and other ministries with technical support based on the latest sector information, assisting in the development of regulations and plans related to ODS management for XPS foam enterprises on a local level; and providing technical support and input for the monitoring and supervision activities organized by the MEE and local EEBs.

Total eligible incremental cost for stage II (2021-2026)

175. The Government of China allocated US \$18,534,654 to the XPS foam sector plan for the period from 2021 to 2026, of which US \$16,127,957 are allocated to the enterprise conversion activities, US \$1,387,291 to TA activities and US \$1,019,406 to the PMU.

Incremental cost of enterprise conversions

176. The methodology for calculating the conversion costs in the revised HPMP will be consistent with the approved HPMP in stage II. The total incremental capital costs (ICCs) for 11 enterprises are shown in Table 2.

Table 2. Total ICCs for 11 enterprises (US \$)

Item	Unit price	Number of units	Sub-total
Extruders	837,000	13.1	10,964,700
Safety renovation	202,600	13.1	2,654,060
Technical and safety training	5,000	11	55,000
Technology transfer, trials, and safety certification	20,000	11	220,000
Total			13,893,760

177. Incremental operational costs (IOCs) for the conversion of the 11 enterprises have been calculated at US \$5,649,686, using the XPS foam sector IOC threshold of US \$1.40/kg, applied to the 4,035.40 mt of HCFC to be phased out by the enterprises.

178. Accordingly, the overall incremental cost for the 11 conversions was calculated at US \$19,543,446. Due to the reduced funding allocated to the XPS foam sector, the level of funds allocated to investment activities is US \$16,127,957. The difference will be co-financed by the beneficiary enterprises.

179. Regarding the allocation of available funds among the 11 enterprises, the cost-effectiveness threshold was calculated at US \$6.00/kg for the first 150 mt consumed by any enterprise, US \$3.00/kg for the next 150 up to 300 mt consumed by that enterprise, and US \$2.00/kg for any additional consumption above 300 mt. For example, for an enterprise consuming 420 mt of HCFC, funding amounts to US \$1,590,000 (i.e, 150 mt * US \$6.00/kg + 150 mt * US \$3.00/kg + 120 mt * US \$2.00/kg). The funding for the 11 enterprises is shown in Table 3.

Table 3. The calculated grant funding for 11 enterprises

HCFC consumption (mt)	Contract amount (US \$)	ICC (US \$)	IOC (US \$)	Cost effectiveness (US \$/kg of HCFC)
4,035.49	16,127,957	12,092,468	4,035,489	4.00

Revised cost of all components

180. In order to duly complete the phase-out of HCFCs in the XPS foam sector by the end of 2025, the Government of China will apply for Multilateral Fund funding of US \$18,534,654 in stage II, of which US \$16,127,957 is designated for conversion activities to phase out the remaining consumption of 1,397 ODP tonnes (equivalent to 24,296 mt of HCFCs) in the XPS foam sector, plus US \$2,406,697 to be used for TA activities and PMU, as summarized in Table 4.

Table 4. Cost breakdown of funding

Activities		Funding (US \$)
Conversion activities	Signing of 11 sub-projects	16,127,957
TA	Monitoring, supervision and capacity-building activities	270,000
	Training and technical support	250,000
	Optimization and evaluation of equipment and technologies	340,000
	Formulation and revision of technical standards	87,291
	Impact assessment for the ban on the use of HCFCs in the sector	50,000
	Study tours on technologies alternative to HCFCs	50,000
	Performance verification	330,000
PMU	Technical consulting service	10,000
	Programme management team	292,570
	Travelling expenses	53,009
	Conference expenses	40,776
	Consulting service fees	36,699
	Auxiliary personnel fees	309,899
	Computers, Internet, postal fees, telephone, and printing	76,455
Office operation service and maintenance, public facilities expenses	209,998	
Total		18,534,654

Tranche distribution (2021-2026)

181. The tranche disbursement schedule for the years 2021 to 2026 is contained in Table 5. The tranche disbursement schedule for stage II of the XPS foam sector plan is in rows 2.2.1 to 2.2.4 of Appendix 2-A of the draft revised Agreement between the Government of China and the Executive Committee submitted by UNDP, is contained in Annex II to the present document.

Table 5. Tranche distribution XPS foam sector plan 2021-2026 (US \$)

Year	2021	2022	2023	2024	2025	2026
Tranche value	5,000,000	2,000,000	3,000,000	1,000,000	4,000,000	3,534,654

Secretariat's comments

182. The Secretariat notes that the overall cost of stage II of the XPS foam sector plan has been adjusted from US \$112,786,630 to US \$44,939,952, out of which US \$26,405,298 have been approved in previous tranches. The level of funds allocated for the period 2021-2026 is US \$18,534,654.

183. In average, the combined cost-effectiveness threshold for individual conversions has been reduced from US \$5.60/kg for the 10 enterprises already assisted to US \$4.00/kg for the 11 new ones, in order to accommodate the maximum possible number of enterprises within the available funding. Consequently, the assisted enterprises will provide a larger share of co-financing, and a large number of enterprises will convert with their own funding.

184. Noting that a large number of enterprises will not receive funding for conversion, the Secretariat asked how the revised plan of action envisaged monitoring overall HCFC phase-out in the sector, especially by the non-assisted enterprises. UNIDO explained that the TA and policy components will direct substantial efforts and resources into building the capacity of local EEBs for monitoring, while the PMU will also provide necessary technical input and sector information to the MEE, the EEBs, and the industry. Ultimately, the Government of China assumes full monitoring responsibility during the implementation of the sector plan; the PMU will provide technical input and sector information to the MEE, the EEBs, and the industry.

185. Regarding the enterprises that are not directly assisted through conversion projects, the Secretariat inquired whether they would receive support through the TA component to facilitate their conversion to low-GWP alternatives. UNIDO explained that the TA component will benefit the transition to low-GWP alternatives by enterprises not assisted through investment projects, and highlighted four activities:

- (a) Training and technical support to enterprises to guide them in adopting low-GWP alternatives, especially on the aspects of technical formulas, equipment, on-site start-up technologies, product testing, and fire safety;
- (b) Workshops to disseminate relevant policies and regulations, as well as share the experiences of beneficiaries;
- (c) Optimization and evaluation of the equipment and technologies to provide timely technical advice and guidance to the industry during the conversion process; and
- (d) Formulation and revision of technical standards, which will also contribute to the market uptake of low-GWP alternatives. The Government of China also plans to issue the recommended catalogue of alternatives to HCFCs in various sectors in order to guide the industry in the selection of low-GWP alternative technologies when replacing HCFCs.

Recommendation

186. The Executive Committee may wish to approve the revised plan of action for stage II of the extruded polystyrene (XPS) foam sector plan submitted by UNIDO in line with decision 84/69(a)(iv)b. and (v) as described in document UNEP/OzL.Pro/ExCom/86/21/Add.1.

REVISED POLYURETHANE (PU) FOAM SECTOR PLAN (World Bank)

Sector plan description

Background

187. At its 77th meeting, the Executive Committee approved the PU foam manufacturing sector plan of stage II of the HCFC phase-out management plan (HPMP) to achieve, by 2026, total phase-out of HCFCs in the sector, in the amount of US \$141,471,210 of the total amount approved in principle for stage II, plus agency support costs for the World Bank. At that meeting, the Executive Committee also approved the first tranche of the PU foam sector plan, and the corresponding 2017 tranche implementation plan.

188. At its 85th meeting, the Executive Committee approved the second tranche of the PU foam sector plan of stage II of the HPMP, and the corresponding 2020-2021 tranche implementation plan. Overall, a total of US \$9,112,039, plus agency support cost for the World Bank, has been approved so far.

189. As of mid-2020, 11 phase-out projects had been signed, four enterprises had adopted cyclopentane technology, five enterprises had adopted water-blown technology, and two enterprises had adopted HFO technology. The ongoing contracts involve seven panel, one pipe insulation, one solar water heater, and two integral skins enterprises to phase out 1,189.17 metric tonnes (mt) of HCFC-141b.

Revised plan of action

190. In line with decision 84/69(a)(iv)b and (v), the World Bank, as the lead implementing agency, has submitted on behalf of the Government of China a revised plan of action for stage II of the PU foam sector plan, for the years 2021 to 2026, at a cost of US \$19,200,000, plus agency support costs of US \$1,344,000 for the World Bank.²⁶

191. Noting that between 2016 and 2020, US \$9,112,039, plus agency support costs have already been approved for the PU foam sector plan, the revised approval in principle for the entire PU foam sector plan is US \$28,312,039, plus agency support costs for the World Bank.

192. In line with the draft revised Agreement submitted by UNDP to the present meeting, no funding is being requested at the present meeting. The next tranche of stage II of the PU foam sector plan of US \$4,000,000, plus agency support costs of US \$280,000 for the World Bank, will be submitted to the second meeting of 2021.

HCFC consumption targets

193. The HCFC phase-out timeline for stage II of the PU foam sector plan is shown in Table 1 and reflected in row 1.3.3 of Appendix 2-A of the draft revised Agreement between China and the Executive Committee in Annex II. The HCFC consumption targets for the PU foam sector have been maintained as originally approved at the 77th meeting.

Table 1. HCFC-141b phase-out targets for stage II of the PU foam sector plan in China

Maximum allowable consumption	Starting point	2016 2017	2018 2019	2020 2021 2022	2023 2024	2025	2026
Mt	49,020	40,451	34,614	26,691	9,804	3,000	0
ODP tonnes	5,392.20	4,449.60	3,774.50	2,965.70	1,078.40	330.00	0
Reduction (ODP tonnes)			675.10	808.80	1,887.30	748.40	333.00
Reduction from starting point (%)			30	45	80	94	100

HCFC phase-out strategy for the PU foam sector plan in 2021-2026

194. Stage II of the HPMP originally estimated that there were 2,100 enterprises in the PU foam manufacturing sector consuming 4,444 ODP tonnes of HCFC-141b, of which 3,639 ODP tonnes were estimated to be eligible for funding. The plan proposed to assist approximately 150 enterprises with consumption above 20 mt and SMEs through systems houses. The revised plan of action proposes assistance to phase out 379.30 ODP tonnes through conversion of individual enterprises, and through 19 systems houses to channel TA including the development of foam blowing formulations to their downstream enterprises (many of which are SMEs). The number of system houses or individual conversion projects to be funded may be adjusted according to circumstances that arise during the implementation stage. The sector plan will be supported by policy and TA components, which will be stepped up in implementation given the reduction in the funding level from the original approval.

195. The implementation of the PU foam sector faces the following challenges: sharp reduction in Multilateral Fund funding; lack of incentive for most PU foam enterprises to phase out HCFC-141b (a low-cost, well performing, safe and mature blowing agent) due to the initial investment in adopting alternatives; and dispersed SMEs with low capital and limited technical and management ability, which make the Government's supervision difficult and costly.

²⁶ As per the letter of 7 September 2020 from the Ministry of Ecology and Environment of China to the World Bank.

196. The strategy of stage II of the PU foam sector plan will promote the application of environmentally friendly, low- GWP alternative technologies in the sector; guide the phase-out with policies and regulations; further improve the supervision mechanism; and strengthen the ability to monitor and inspect the PU foam sector. With regard to the manufacturing sector, it will strengthen technical training and encourage enterprises to phase out HCFC-141b on their own; support conversion of enterprises with demonstration potential and high cost-effectiveness; restrict the supply of raw materials required for the formulation of HCFC-141b-based foam systems by restricting the use of HCFC-141b at systems houses; and strengthen technical support by systems houses to the SMEs undertaking their own conversions.

197. The activities in the plan of action for stage II are grouped in four components: policies and regulations; enterprises' phase-out activities; TA activities; and project management.

Policy and regulations

198. The objectives of the ODS phase-out policy are: to ensure that HCFC-141b in the PU foam industry is phased out as planned, minimizing the negative impact on the development of the foam industry; and to encourage and promote the adoption of environmentally friendly, economically acceptable and technically feasible alternatives. The Government will formulate supporting policies and regulations while carrying out the phase-out plan for the PU foam sector, as shown in Table 2. The Government is also considering adding a requirement on purchasing products without ODS to the Government's green procurement policy, and adopting environmental labeling certification on products that do not use ODS or HFCs with high-GWP values, to accelerate and encourage the phase-out process.

Table 2. Overall set of policies required in the PU foam sector

Policy type	Content of the policy
Administration	<ul style="list-style-type: none"> • Focus on the control of HCFC-141b production on a national level • Addition of enterprises that completed the phase-out of HCFC-141b to the supervision list • Formulation of a list of recommended alternatives to HCFCs • Ban on using HCFC-141b in solar water heaters and pipe insulation sub-sectors as of 1 January 2023 • Ban on using HCFC-141b in other sub-sectors except the spray foam sub-sector as of 1 January 2025 • Ban on using HCFC-141b in the PU foam sector as of 1 January 2026
Sector management	<ul style="list-style-type: none"> • Formulation of industrial policies to guide the PU foam sector to phase out HCFC-141b • Revision of technical and product standards according to progress and demands during the phase-out process • Monitoring of HCFC-141b consumption through the annual material balance calculation
Evaluation and publicity management	<ul style="list-style-type: none"> • Development of an evaluation system for technologies alternative to HCFC-141b, including the phase-out progress per sub-sector, GWP value, ODP value, conversion costs, product performance and production safety
Supervision and administration management	<ul style="list-style-type: none"> • Establishment of a national ODS atmospheric monitoring network • Specification of the responsibilities of local authorities, formulation of local laws and regulations, improvement of record-keeping management systems, and strengthening daily supervision and administration • Development of a product-sampling programme using quick detectors to identify products containing HCFC-141b (particularly those products for which the use of HCFC-141b has already been banned under stage I)

199. The revised plan of action for the PU foam sector will include the issuance of policies covering administration and industry management (e.g., bans on the use of HCFC-141b in different sub-sectors, formulation and updating of standards, the recommended list of alternatives to HCFCs). Other measures aimed at supervision and industry management are national complementary activities (e.g., establishing a national ODS atmospheric network).

Phase-out activities at enterprises

200. Stage II of the HPMP was approved for an accelerated phase-out of HCFC-141b in the PU foam sector, including a 30 per cent reduction in 2018, which was completed as scheduled. Pipeline insulation and solar water heaters are the two priority sub-sectors to phase out HCFCs; the targets for other sub-sectors will be based on the feasibility and cost of low-GWP alternative technologies, with phase-out in the spray foam sub-sector expected to be completed in the final phase of stage II.

201. Given the funding level available and the fact that most enterprises in the sector are SMEs, the implementation of conversions at individual enterprises alone would not be sufficient to achieve the HCFC phase-out required to meet the Government of China's obligations. Therefore, the revised phase-out strategy includes providing TA to PU foam enterprises, mostly to SMEs, through systems houses. The allocation of funds and the number of projects both at the systems houses and at the individual enterprises might be adjusted according to circumstances arising in the course of implementation.

202. During the implementation of the action plan for the PU foam sector, hydrocarbon (HC), water-blown and HFO technology will continue to be the main alternative technologies.

Individual conversion projects for large and medium-scale enterprises

203. A limited number of individual conversion projects (estimated at 30 to 40) will be supported from 2021 to 2026 (at an estimated cost of US \$9,314,000). Large enterprises will carry out conversion activities using their own resources. Funding from the Multilateral Fund will be used as an incentive for early phase-out. The individual projects will also serve as demonstration by providing experience and technical information to the various foam sub-sectors, and by inviting suppliers of equipment and/or material to develop compatible facilities and solutions for the market. From 2021, the PU foam industry is expected to phase out about 2,259 mt (248.49 ODP tonnes) of HCFC-141b through the individual conversion projects.

Systems house projects

204. The plan of action intends to assist mostly SMEs to undertake the phase-out of HCFC-141b through systems houses as suppliers of materials, alternative technologies and TA. Nineteen systems houses will be supported (at an estimated cost of US \$5,450,000), including 15 producers of water or HFO pre-blended polyols and four producers of HC pre-blended polyols. Priority will be given to systems houses with a high consumption of HCFC-141b, those located in provinces with a high concentration of HCFC-141b consumption and foam enterprises, those in provinces where no systems house projects have been implemented before, and those whose downstream enterprises are primarily HCFC-141b consumers.

205. An HCFC-141b phase-out target will be set for systems houses that would like to participate in the project. These systems houses should achieve reduction milestones in the years specified in the contract, until HCFC-141b is completely phased out by 2026. This method will allow control of HCFC-141b consumption and will use the market network to actively promote alternative technology applications, from the systems houses to downstream enterprises.

206. Further to the three established HC pre-blended polyol production capacities in stage I, there are plans to establish another four HC pre-blended polyol production capacities to support enterprises wishing to invest in production equipment and safety conversion in other regions. These systems houses aim to meet the market demand for HC pre-blended polyols, while reducing the transportation radius and safety risks.

207. In addition, the establishment of 15 water-based or HFO pre-blended polyol production capacity projects is planned. On the basis of investment in relevant production equipment for systems houses, funding will also be provided for systems houses to deliver TA and raw materials to the downstream SMEs to support their phase-out of HCFC-141b.

TA activities

208. Stage II of the PU foam sector plan will continue to carry out TA activities in the period 2021-2026 (at a cost of US \$3,380,000) to ensure the timely achievement and sustainability of phase-out targets, as listed in Table 3.

Table 3. TA activities in the PU foam sector plan

Activity	Objectives	Cost (US \$)
Studies (research and development) on alternative technologies	Strengthening the capacity to study and optimize foam systems with alternative technologies, especially in SMEs, by research institutions publicly invited by the Foreign Economic Cooperation Office (FECO) to participate. The institutions will evaluate the advantages and disadvantages of alternative foaming effects and cost reduction, and will share the outcomes	400,000
Technical consulting services	Providing support to FECO on policies and development of alternative technologies, reviewing and evaluating sub-projects, and delivering technical comments on verifications and presentations during the training workshops and seminars	30,000
Revision of industry standards	Revising existing standards for foam products in different applications, taking into account changes in foam properties when using alternative technologies, experience gained from the implementation of stage I, and circumstances of the application of alternatives	250,000
Policy impact assessment	Conducting technical feasibility studies to evaluate in advance the environmental, economic and social impact on the industry of the planned bans on the use of HCFC-141b in different PU foam sub-sectors	200,000
Capacity building for local EEBs and other sectors	Providing assistance to local EEBs in monitoring the consumption and phase-out of HCFC-141b, in regions with a high concentration of PU foam enterprises. Training on PU foam production knowledge, testing methods and key points, enforcement protocols and examples for enforcement officers	500,000
Domestic executive implementation support agency (ISA)	Technical advice and support from ISA to FECO and concerned enterprises, including the selection of alternative technologies, assisting enterprises in drafting implementation plans, and conducting sub-project technical verification and acceptance procedures	830,000
Baseline verification	Conducting audits of baseline consumption and qualification of enterprises applying for phase-out sub-projects	290,000
Performance verification	Verification of the implementation of phase-out activities, milestones of HCFC-141b phase-out, status of use of alternative technologies, and use of the Multilateral Fund funding at beneficiary enterprises	290,000
Study tours and exchanges	To facilitate sharing information on policies and best practices in monitoring and enforcement, and on alternative technologies between national stakeholders (Government, industrial associations, and research institutes) and their counterparts in non-Article 5 countries	150,000
Creation of an academic network	Helping enterprises establish partnerships with universities, colleges and research institutes to share knowledge of developments in non-ODS industry, promoting the adoption of alternative technologies, and updating policy measures	
Public awareness and outreach	Public outreach strategy to solicit the support and participation of the foam industry and the public and help create demand for greener products in construction, appliances, and other sectors, including <i>inter alia</i> publications, posters and conferences	50,000
Total		3,380,000

Project implementation and monitoring unit (PMU)

209. The PMU (at a cost of US \$1,056,000) will continue to manage and monitor project implementation. PMU activities include: recruiting enterprises to participate in HCFC-141b conversion activities and monitoring implementation of their activities; organizing and participating in verifications, evaluation meetings, and commissioning during project implementation, facilitating independent verification of sub-project completion; reviewing project documents submitted by beneficiaries and processing contract performance; communicating and coordinating with the World Bank, the ISA, technical experts and other stakeholders on project implementation; designing TA activities and recruiting qualified implementing agencies; and preparing work plans, progress reports and other documents as required.

210. The PMU will also assume more responsibilities in the area of communications and cooperation with policymakers and industry through: the organization of work and coordination meetings with national policy makers, industrial associations and representatives to discuss phase-out progress and policy measures to phase out HCFC-141b in the PU foam sector, as well as actions to promote the penetration of alternative technologies; providing the Ministry of Ecology and Environment (MEE), local EEBs and other ministries with technical support on the latest sector information and assisting in the development of regulations and plans related to ODS management for PU foam enterprises and systems houses at the local level; and providing technical support and input for the monitoring and supervision activities organized by the MEE and local EEBs.

Total eligible incremental cost for stage II (2021-2026)

Incremental cost for enterprise conversions

211. A total of US \$14,764,000 was allocated to enterprise phase-out activities between 2021 and 2026, including US \$9,314,000 for individual conversions and US \$5,450,000 for systems house projects.

Individual conversion projects

212. For the revised plan of action, the cost of enterprise conversion activities was determined according to the low-GWP technology selected. Conversions to HCs will only include incremental capital costs (ICC) to cover equipment retrofit and plant adaptations to cover minimum safety requirements, while conversions to HFO and water-blown technology will only include incremental operational costs (IOC) required to cover the price difference of the blowing agent (HFO) or other raw material chemicals (water-blown technology). The average values calculated are largely consistent with those approved for stage II of the HPMP.

213. Given the level of funds available for the PU foam sector plan, the scale of conversion activities and the level of funding provided to enterprises were adjusted as shown in Table 4.

Table 4. Incremental costs for individual conversion projects (US \$)

Alternative technology	Enterprises converting to HC	Enterprises converting to HFO or water	Total
ICC to be provided (US \$/kg HCFC-141b)	6.00	0.00	
IOC to be provided (US \$/kg HCFC-141b)	0.00	4.00	
Estimated phase-out impact (mt)	139	2,120	2,259
Total cost (US \$)	834,000	8,480,000	9,314,000

Systems house projects

214. For the four systems houses that will supply pre-blended HCs, Multilateral Fund assistance will be used primarily to build production capacity and for safety adaptations. For the 15 systems houses that will supply HFO or water-based technology, assistance will be used to invest in capacity building, in technical

guidance and in raw material trial costs for downstream SMEs. The estimated funding level for the systems houses is shown in Table 5

Table 5. Cost of the systems house projects (US \$)

Description	HC		HFO/water
	Low-speed mixing kettle mode	Static premix mode	
Pre-blended polyol low-speed mixing kettle and foaming agent storage tank	170,000		80,000
HC storage tank and pre-mixing units		170,000	
Safety measures	120,000	120,000	
Packing facility for pre-blended polyols	40,000	40,000	30,000
Experimental and testing facilities			15,000
Raw material IOC			50,000
Trials, training and technical support	20,000	20,000	25,000
Total	350,000	350,000	200,000
Funding from the Multilateral Fund	300,000	300,000	150,000

215. The total cost of the systems house projects under stage II of the HPMP is shown in Table 6.

Table 6. Total cost of the systems house projects (US \$)

Systems houses	HC	HFO/water	Total
Fund to be provided (US \$)	300,000	150,000	-
Number of systems houses	4	15	19
Total cost systems houses (US \$)	1,200,000	2,250,000	3,450,000
Trial cost for downstream SMEs (US \$)	0	50,000	-
Supported downstream SMEs	0	40	40
Total cost downstream SMEs (US \$)	-	2,000,000	2,000,000
Total cost (US \$)	1,200,000	4,250,000	5,450,000

PMU cost

216. The PMU costs for stage II of the PU foam sector plan from 2021 to 2026 are shown in Table 7.

Table 7. PMU costs (US \$)

Description	Cost (US \$)
Project staff	316,800
Domestic and international travel	52,800
Domestic and international meetings	42,240
Consulting services	42,240
Supporting staff	316,800
Computer, Internet, post, phone, printing, etc.	73,920
Office operation service and maintenance, utilities	211,200
Total	1,056,000

Revised cost of all components

217. In summary, the Government of China allocated US \$19,200,000 to the PU foam sector for the period from 2021 to 2026, of which US \$14,764,000 are allocated to the enterprise conversion activities, US \$3,380,000 to TA activities and US \$1,056,000 to the PMU, as specified in Table 8.

Table 8. Cost breakdown for the PU foam sector 2021-2026 action plan

Activities	Cost (US \$)
Enterprise conversion activities	14,764,000
TA activities	3,380,000
PMU	1,056,000
Total	19,200,000

Tranche distribution (2021-2026)

218. The tranche disbursement schedule for the years 2021 to 2026 is contained in Table 9. The entire tranche disbursement schedule for stage II of the PU foam sector plan is in rows 2.3.1 and 2.3.2 of Appendix 2-A of the draft revised Agreement between the Government of China and the Executive Committee submitted by UNDP, in Annex II.

Table 9 Tranche distribution for the 2021-2026 PU foam sector plan (US \$)

Year	2021	2022	2023	2024	2025	2026
Tranche value	4,000,000	0	5,000,000	1,000,000	5,000,000	4,200,000

Secretariat's comments

219. The Secretariat notes that the overall cost of stage II of the PU foam sector plan has been adjusted from US \$141,471,210 to US \$28,312,039, out of which US \$9,112,039 have already been approved in previous tranches. The level of funds allocated to the period of 2021-2026 is US \$19,200,000.

220. In addition to the reduction in the number of enterprises assisted under stage II, the funding to be provided to individual sub-projects has been reduced from an average of US \$6.23/kg to US \$6.00/kg for enterprises converting to HC and from US \$6.79/kg to US \$4.00/kg for enterprises converting to HFO or water-based technology. Consequently, the enterprises will provide a larger share of co-financing.

Systems house projects

221. The Secretariat notes a prominent role of the systems houses given their influence on technology and the TA they can provide to SMEs. Regarding the estimated number of enterprises that could be converted and the level of HCFC-141b consumption that could be phased out because of the assistance to the 19 systems houses, the World Bank indicated that, based on the amount of funding allocated, it would be expected that each systems house could reach around 40 eligible downstream enterprises. However, these numbers will be better known upon the presentation of tranche requests, at which time they will be provided. The 19 systems houses are also expected to extend technical support to additional 300 enterprises in order to facilitate conversions through those enterprises' own financial resources.

222. The Secretariat requested more details on the planned system to monitor the progress made by systems houses. The World Bank indicated that the project will set up an incentive-based mechanism to ensure that systems houses identify and work with eligible downstream enterprises and that the number of enterprises and the amount of HCFC-141b phase-out is tracked. As systems houses share their customer names and locations during implementation, the Government can include those enterprises in the provincial HCFC-141b user registries (if they are not already registered) so that the EEBs can continue monitoring them.

223. The World Bank also explained that in addition to the EEBs' normal monitoring, the project would ensure that there were periodic checks of downstream enterprises (once systems houses confirm that assistance has been provided). As part of its supervisory role, the World Bank will also conduct regular site visits to a percentage of SMEs assisted through the systems houses.

Monitoring and sustainability of the phase-out of HCFC-141b

224. Noting that there may be systems houses that will not receive funding from the project, the Secretariat considered it important to promote their simultaneous phase-out of HCFC-141b, so that the clients of the assisted systems houses do not return to HCFC-141b by switching to a non-assisted systems house as supplier. The World Bank indicated that the sustainability of the downstream enterprise conversions could be ensured by tying assistance to a commitment by each enterprise to cease HCFC use, and checking through the provincial registry of enterprises, which will allow local EEBs and FECO to conduct follow-up. The revised plan of action includes workshops and targeted awareness campaigns to inform all PU foam stakeholders of planned bans and timing, available alternatives, and where those alternatives can be sourced. The World Bank also reiterated that the delivery mechanism, including the checks and balances needed to promote sustainable phase-out through the systems house component, will be further developed upon approval of the revised action plan.

225. As there will also be a larger number of PU foam enterprises that will not receive funding from the project, the TA and policy components will direct substantial efforts and funding into building the capacity of local EEBs for monitoring the phase-out of HCFC-141b, building on the work already completed under stage I. Ultimately, it will be the Government of China that assumes full monitoring responsibility during the duration of the foam sector plan; the PMU will provide technical input and sector information to the MEE, the EEBs, and the industry.

226. The TA component also includes activities to facilitate the conversion of non-assisted enterprises to low-GWP alternatives. The information exchange platform will facilitate supplier-enterprise “match-making” for certain pre-blended polyols and formulations. An enabling environment for the conversion will also be created largely through the revision/introduction of foam product standards (by application). This will be complemented by capacity-building measures (i.e., technical seminars on alternatives, training, and sector conferences) and general awareness-raising initiatives. In addition, an evaluation of alternative technologies, and research and development on low-GWP alternatives and foaming formulas will be conducted during the implementation of the sector plan. The Government of China plans to issue a recommended list of HCFC alternatives in order to guide the market uptake of low-GWP alternatives. However, it is also acknowledged that the project will have some limitations with regard to its breadth of influence over certain applications/sub-sectors and non-funded enterprises.

Recommendation

227. The Executive Committee may wish to approve the revised plan of action for stage II of the polyurethane (PU) foam sector plan submitted by the World Bank in line with decision 84/69(a)(iv)b. and (v), as described in document UNEP/OzL.Pro/ExCom/86/21/Add.1.

REVISED SOLVENT SECTOR PLAN (UNDP)**Sector plan description****Background**

228. At its 76th meeting, the Executive Committee approved in principle the solvent sector plan of stage II of the HPMP for China to achieve by 2026, complete phase-out of all HCFCs in that sector, in the amount of US \$44.8 million, plus agency support costs of US \$2,912,000 for UNDP.

229. The second tranche for the solvent sector plan of stage II of the HPMP was approved by the Executive Committee at its 80th meeting, with the corresponding 2017-2018 tranche implementation plan. At its 82nd meeting, the Executive Committee noted the request from the Government of China for the third tranche of the solvent sector plan and decided to defer consideration of these requests to the 83rd meeting

(decision 82/71(b)); at which meeting a decision was made to further defer consideration of the third tranche to the 84th meeting (decision 83/55).

230. The third tranche of the solvent sector plan of stage II of the HPMP for China, and the corresponding 2020-2022 tranche implementation plan was approved in the amount of US \$12,946,782, plus agency support costs of US \$906,275 for UNDP during the intersessional approval process (IAP) established for the 85th meeting.²⁷

Revised plan of action

231. In line with decision 84/69(a)(iv)b and (v), UNDP as the lead implementing agency had submitted on behalf of the Government of China, revised funding tranches for 2021-2026 as well as the adjusted plan of action for stage II of the solvent sector plan, at a revised total cost amounting to US \$25,589,340, plus agency support costs of US \$1,802,585 for UNDP.²⁸ The implementation of stage II of the solvent sector plan will assist China in meeting the Montreal compliance target of 67.5 per cent in 2025, and the total phase-out of HCFC-141b and HCFC-225ca in the solvent sector in 2026.

232. In line with the draft revised Agreement submitted by UNDP to the 86th meeting, the next tranche of stage II of the solvent sector plan of US \$2,500,000, plus agency support costs of US \$187,500 for UNDP, will be submitted to the second meeting of 2021.

HCFC consumption targets

233. The HCFC consumption targets for all the years in stage II of the solvent sector were maintained as previously approved, and the Government of China had committed to achieve a complete phase-out of HCFCs used in the solvent sector by the end of 2025. The HCFC phase-out timeline for stage II of the Solvent sector is shown in Table 1 and reflected in row 1.3.2 of Appendix 2-A of the draft revised Agreement between China and the Executive Committee in Annex II.

Table 1. HCFC phase-out targets for the solvent sector in China

Maximum allowable consumption of HCFCs in the solvent sector	Starting point	2016 2017	2018 2019	2020 2021 2022	2023 2024	2025	2026
Metric tonnes (mt)	4,173	4,173	3,624.51	2,944.91	1,359.19	500	0
ODP tonnes	455.2	455.2	395.4	321.2	148.3	55	0
Reduction (mt)		357.63	548.49	679.60	1,585.72	859.19	500
Reduction (ODP tonnes)		39.05	59.79	74.14	172.97	93.27	55
Reduction from starting point (%)		10	20	35	70	88	100

Components of the revised plan of action

234. The revised plan of action for stage II of the solvent sector plan comprises four components: investment activities at the enterprise level, 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.

²⁷ Paragraph 94(b) of UNEP/OzL.Pro/ExCom/85/IAP/3 (Projects approved intersessionally).

²⁸ As per the letter of 7 September 2020 from the Ministry of Ecology and Environment of China to UNDP.

Investment projects

235. The investment project will cover 18 small and medium-sized enterprise (SMEs) in the disposable medical devices (DMD) sub-sector and seven SMEs in the electronic degreasing sub-sector, with a verified HCFCs baseline consumption of 372.19 mt (40.92 ODP tonnes) of HCFC-141b. The total funding allocated for these enterprises is US \$2,041,421, at a cost-effectiveness level of US \$9.86/kg, which is lower than that in the sector plan as originally approved (US \$13/kg). This required counterpart funding from the beneficiary enterprises to ensure the phase-out of HCFCs at the committed date. 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).

236. Based on technical consultations with the stakeholders, it was agreed that for the DMD sub-sector, only IOC will be provided as this sub-sector has well-known alternatives, requires similar parts for conversion, and a technical manual for the HCFCs phase-out in the sub-sector was produced in 2018. The phase-out associated with the DMD sub-sector amounts to 237.9 mt (26.17 ODP tonnes) of HCFC-141b at a cost of US \$689,910, at a cost-effectiveness of US \$2.90/kg.

237. The remaining funding amounting to US \$1,324,511 is allocated to the electronics degreasing sub-sector, to phase out 134.29 mt (14.77 ODP tonnes) of HCFC-141b, at a cost-effectiveness of US \$9.86/kg to cover ICC and IOC.

238. The Government of China emphasized that this is the most-cost-effective approach to assist eligible enterprises in solvent sector; it will allow conversions with the preferred alternatives at the same time taking into account safety measures and health considerations. The funding to be provided will be mostly for supporting activities, such as training, testing and detection, environmental and safety assessments.

Policy and regulatory interventions

239. To support the investment activities and the sustainable phase out of HCFC-141b in the solvent sector, the Government will introduce policies, laws and regulations into the overall ODS policy framework. This will ensure that the phase-out in the solvent sector is met and sustained; establish effective mechanisms to encourage a wide participation of enterprises in the phase-out activities and adopt environmentally friendly alternatives; promote the research and development and uptake of alternatives for HCFC-141b; that the growth of the sector is not negatively affected by conversion activities; and, the possibility of introducing tax and financial incentives to encourage enterprises to participate in the phase-out.

TA

240. TA activities, at a funding level of US \$1,400,000, are designed to support the sustainable phase-out of HCFC-141b, HCFC-225ca, and HCFC-225cb in the solvent sector, and include:

- (a) Training for enterprises on the procedures for implementation of conversion activities, procurement of equipment and services, and monitoring and reporting project progress; meetings to exchange experiences in project implementation, information on available alternatives and their applications to support enterprises with their phase-out activities; and policy consultation meetings to gain support for new approaches and regulations that may be established during implementation (US \$75,000);
- (b) Improving capacity of authorities to manage and monitor the phase-out in the solvent sector including local Ecology and Environment Bureaus (EEBs) and industrial associations through meetings and workshops (US \$200,000);

- (c) An implementation supporting agency (ISA) will provide supervision and consultancy services including screening and evaluation of alternatives; assisting eligible enterprises to complete necessary documentation for funding; assisting the project management team in project verification, supervision and evaluation; and providing SME's with TA necessary to support their phase-out (US \$700,000);
- (d) Carry out market research and evaluation on the promotion and application potential of various available alternatives, formulate and update relevant standards and safety requirements for alternatives (US \$125,000)
- (e) Research, and analyze the feasibility of introducing a ban on HCFC consumption for the solvent sector; and how it could be managed (US \$150,000);
- (f) Evaluation by sector experts, ISA, or competent local departments through field investigation of enterprises that have completed HCFCs phase-out in the solvent sector on the effectiveness of the phase-out actions (US \$100,000); and
- (g) Study visits by project management personnel, representatives from local EEBs, associations, scientific research institutions to institutions in other countries to facilitate sharing information on policy and alternative technologies to HCFC-141b and gain experiences in the selection of alternatives including the organization and management of phase-out activities (US \$50,000).

PMU

241. The PMU (US \$331,288) will continue to be used for: monitoring implementation of sub-grant agreements and TA activities; organizing and participating in verifications, evaluation meetings, and project commissioning; reviewing project documents submitted by beneficiaries and processing contract performance; communicating and coordinating with implementing agencies, ISA, technical experts and other stakeholders on project implementation; designing TA activities, developing terms of reference and selecting qualified implementing agencies; and preparing work plans, progress reports and other documents as required.

242. The PMU will undertake more responsibilities in the area of communications and cooperation with policy makers and industry through: the organization of work and coordination meetings with policy makers and industrial associations discuss HCFC phase-out progress and policy measures, as well as actions to promote the penetration of alternative technologies; providing the MEE, local EEBs and other ministries with technical support based on the latest sector information, assisting in the development of regulations and plans related to ODS management for solvent enterprises on a local level; and providing technical support and input for the monitoring and supervision activities organized by the MEE and local EEBs.

Total funding allocated for stage II of the solvent sector

243. In line with the revised agreement for stage II of the HPMP at the 84th meeting and the adjusted work plan, the funding of US \$6,043,431 including support costs of US \$453,257 will be allocated to the solvent sector plan for the period from 2021 to 2026.

Incremental cost for enterprise conversions

244. The estimated costs for the investment projects are calculated at US \$2,041,421 for the conversion of 25 enterprises, summarized in Table 2.

Table 2: Estimated funding for the conversion of 25 enterprises in the solvent sector

Description	DMD	Electronics degreasing
HCFC-141b to be phased out 2021-2026 (mt)	237.90	134.29
Number of enterprises	18	7
Payment	IOC only	ICC and IOC
Cost-effectiveness (US \$/kg)	2.90	9.86
Total cost (US \$)	689,910	1,324,511

Revised cost of all components

245. In order to complete the phase-out of HCFC-141b in the solvent sector by the end of 2025, the Government of China, has allocated US \$6,023,431 for the solvent sector between 2021 and 2026, as described as summarized in Table 3.

Table 3. Cost breakdown of funding for the solvent sector plan (2021-2026)

Description	Activities	Funding (US \$)
Conversion enterprises	Investment projects for 25 enterprises	4,292,143
TA	Policy development, standards setting, etc.	1,400,000
PMU	Programme management team	64,011
	Travel (domestic/international)	17,192
	Meetings and conferences	15,205
	Consulting service fees	13,780
	Auxiliary personnel fees	114,820
	Computers, Internet, postal fees, telephone, and printing	28,425
	Office operation service and maintenance, public facilities expenses	77,855
Total		6,023,431

Tranche distribution (2021-2026)

246. The tranche disbursement schedule for the years 2021 to 2026 is contained in Table 4. The entire tranche disbursement schedule for stage II of the Solvent sector plan is in rows 2.6.1 and 2.6.2 of Appendix 2-A of the draft revised Agreement between the Government of China and the Executive Committee submitted by UNDP, in Annex II

Table 4. Tranche distribution solvent sector plan 2021-2016 (US \$)

Item	2021	2022	2023	2024	2025	2026
Amount	2,500,000	1,000,000	2,000,000	0.00	523,431	0.00

Secretariat's comments

247. The Secretariat noted that the overall cost of stage II of the solvent sector plan was adjusted from the original approval of US \$44,800,000 to US \$25,589,340; and that the Government of China, with the adjusted funding committed to meet the total phase-out of HCFC-141b in the solvent sector through the adoption of low-GWP alternatives. It was explained that the reduction in funding will be able to provide assistance to only a limited number of beneficiaries, however, the Government intends to implement a package of policy, regulations and TA to encourage and sustain the phase-out in the sector. These will include the strict enforcement of the quota and registration management of enterprises, as well as potential bans on HCFC-141b consumption in the solvent sector. The Government had also made commitments with the solvent enterprises in order for them to provide counterpart funding to enable conversions of a large number of SMEs.

248. UNDP further explained that there will be close monitoring of the phase-out in these solvent enterprises which will be done through strengthened capacity of local EEB's (training and capacity building of EEB's for supervision and inspection of ODS related activities are planned for 2021). The MEE has also

issued guidelines on a trial basis for the supervision of ODS and training of officials from provincial, municipal, and county levels to manage and monitor the HCFC phase-out.

249. In clarifying the difference between the cost of consultancy services as part of TA and the same cost included in the budget for the PMU, UNDP explained that consultancy services that are part of TA will focus on consultations for the enterprises in the solvent sector, whereas the cost included in the PMU will refer to consultation provided to FECO staff during project management and monitoring.

Recommendation

250. The Executive Committee may wish to approve the revised plan of action for stage II of the solvent sector plan submitted by UNDP in line with decision 84/69(a)(iv)b. and (v) as described in document UNEP/OzL.Pro/ExCom/86/21/Add.1.

PART IV: REPORT ON PROGRESS IN THE IMPLEMENTATION OF ACTIVITIES LISTED IN DECISION 83/41(e)

Background

251. At its 83rd meeting, the Executive Committee considered the following two documents:

- (a) Review of current monitoring, reporting, verification and enforcement (MRVE) systems in accordance with HCFC consumption and production phase-out management plan Agreements between the Government of China and the Executive Committee, submitted by UNDP on behalf of the Government of China, in line with decisions 82/65 and 82/71(a); and
- (b) Desk study on the current system of monitoring consumption of foam-blowing agents at enterprises assisted under stage I of the HCFC phase-out management plan and verification methodology submitted by the World Bank on behalf of the Government of China in line with decision 82/67(c).

252. In its deliberations, the Committee *inter alia* welcomed a number of regulatory and enforcement actions to be undertaken by the Government; noted with appreciation that the Government will undertake additional actions in support of its enforcement actions; and further noted with appreciation that the Government will consider a set of suggestions to supplement and augment its regulatory and enforcement actions. The Executive Committee also noted that the Government of China would submit a report at the 84th meeting, and again to the 86th meeting, on its progress in implementing the activities described in sub-paragraphs (a) to (d) of decision 83/41.

253. At its 84th meeting, the Executive Committee considered the progress report submitted by the Government of China in line with decision 83/41(e).²⁹ Subsequent to a discussion, the Executive Committee took note of the information provided by the representative of the Government of China regarding implementation of the activities listed in decision 83/41.

254. The Government of China has submitted to the 86th meeting a Progress report pursuant to decision 83/41 (“*Progress Report*”). The Progress Report is attached in its entirety to the present document without editing or further review.

²⁹ UNEP/OzL.Pro/ExCom/84/22/Add.1.

PART V: STUDY TO DETERMINE THE REGULATORY, ENFORCEMENT, POLICY OR MARKET CIRCUMSTANCES THAT MIGHT HAVE LED TO THE ILLEGAL PRODUCTION AND USE OF CFC-11 AND CFC-12 (DECISION 83/41(d))

Background

255. In the context of its discussions at the 83rd meeting on China's MRVE systems, the Executive Committee *inter alia* decided to note that the Government of China will consider engaging a non-governmental consultant to undertake a study (including quantitative data, where available, and qualitative market information) to determine the regulatory, enforcement, policy or market circumstances that might have led to the illegal production and use of CFC-11 and CFC-12 (decision 83/41(d)).

256. Pursuant to decision 83/41(d), the Government of China has submitted to the 86th meeting the Study on the Supervision, Law Enforcement, Policy and Market Situation of Ozone Depleting Substances in China that was prepared by a non-governmental consultant. That study is attached in its entirety to the present document without editing or further review.

PART VI: FINANCIAL AUDIT REPORTS FOR THE CFC PRODUCTION, HALON, PU FOAM, PROCESS AGENT II, REFRIGERATION SERVICING AND SOLVENT SECTORS

Note by the Secretariat

257. The financial audit reports as of 31 December 2019 for the CFC production, halon, polyurethane (PU) foam, process agent II, refrigeration servicing and solvent sectors, were submitted in line with decision 84/39(c) to the 85th meeting and included in document UNEP/OzL.Pro/ExCom/85/9.

258. This matter was not considered under the intersessional approval process established for the 85th meeting. As the meeting was postponed due to restrictions associated to the COVID-19 pandemic, the matter is included again in the present document for consideration at the 86th meeting. As there have not been modifications or additional information submitted, the section presented at the 85th meeting is reproduced below in its entirety for consideration by the Executive Committee. Text has been updated in two paragraphs and the recommendation using **bold** for ease of reference.

Background

259. At its 84th meeting, the Executive Committee considered the financial audit reports for the CFC production, halon, polyurethane (PU) foam, process agent II, refrigeration servicing and solvent sectors, in which an update of activities implemented in each sector plan was also provided.³⁰ Subsequently, the Executive Committee *inter alia* requested the Government of China, through the relevant implementing agency, to submit at the 85th meeting the financial audit reports as at 31 December 2019 for the CFC production, halon, PU foam, process agent II, refrigeration servicing, and solvent sector plans, and the project completion reports (PCRs) for the CFC production, PU foam, refrigeration servicing and solvent sector plans; and to return to the Multilateral Fund at the 85th meeting the funding balances available as at 31 December 2019 associated with the CFC production, PU foam, refrigeration servicing and solvent sector plans (decision 84/39(c)(i) and (c)(ii)).

260. In line with decision 84/39(c)(i), relevant implementing agencies, on behalf of the Government of China, submitted the financial audit reports as at 31 December 2019 and PCRs for the CFC production, PU foam, refrigeration servicing and solvent sectors. Supplemental final reports were submitted for the refrigeration servicing and solvent sectors. An update on progress in the process agent II sector is provided in paragraphs 218 to 230 of ~~the present~~ document **UNEP/OzL.Pro/ExCom/85/9**.

261. The financial data in the present report is based on the audit report submitted by the Government of China as of 31 December 2019, reflecting remaining balances of US \$11,309,628 (Table 1). The remaining balances from completed sector plans (i.e., CFC production, PU foam, refrigeration servicing and solvent) amount to US \$792,215 (i.e., US \$311,653 from balances US \$480,561 from cumulative interest). In line with decision 84/39(c)(ii), the balances being returned to the 85th meeting therefore amount to US \$792,215.

Table 1. Remaining balances and interest for CFC production, halon, PU foam, process agent II, refrigeration servicing, and solvent sector plans (US \$)

Activity	Balance as at 30 June 2019	Balance as at 31 Dec. 2019	Cumulative interest	Completion date
CFC production (World Bank)	179,878	33,907	22,119	Dec. 2019
Halon sector (World Bank)	9,154,827	8,913,167		Dec. 2020
Process agent II (World Bank)	3,076,109	2,084,808		Dec. 2020
PU foam (World Bank)	897,009	280,108		Dec. 2019

³⁰ Paragraphs 6-105 of UNEP/OzL.Pro/ExCom/84/22/Add.1.

Activity	Balance as at 30 June 2019	Balance as at 31 Dec. 2019	Cumulative interest	Completion date
Servicing (Japan, UNEP, UNIDO)	735,791	752	99,178	Dec. 2019
Solvent (UNDP)	708,822	-3,114*	359,265*	Dec. 2019
Total	14,752,436	11,309,628	480,561	

*The total balance to be returned by UNDP is calculated as US \$356,151.

Secretariat's comments

262. The CFC production, PU foam, refrigeration servicing, and solvent sector plans have been completed. While preliminary PCRs have been submitted, the financial data **therein** does not yet reflect the final disbursements to beneficiaries, nor the returns to the 85th meeting. The Senior Monitoring and Evaluation Officer is working with the relevant implementing agencies to ensure the financial data is included in the respective PCRs.

263. As agreed at the 84th meeting, the halon and process agent II sector plans will be completed by 31 December 2020, and any remaining balances as at that date would be returned to the 87th meeting, in line with decision 84/39(b).

Recommendation

264. The Executive Committee may wish:

- (a) To note:
 - (i) The financial audit reports for the CFC production, halon, polyurethane (PU) foam, process agent II, solvent and servicing sectors in China, contained in document UNEP/OzL.Pro/ExCom/85/9;
 - (ii) That the World Bank will return the remaining balances in the CFC production and PU foam sectors of US \$314,015, and accumulated interest of US \$22,119, to the **86th** meeting;
 - (iii) That UNIDO will return the remaining balances in the refrigeration servicing sector plan of US \$752, plus accumulated interest of US \$99,178 to the **86th** meeting;
 - (iv) That UNDP will return US \$356,151, the accumulated interest from the solvent sector plan to the **86th** meeting;
- (b) To request the World Bank to submit the financial audit reports for the halon and process agent II sector plans that would be completed by 31 December 2020, in line with decision 84/39(b) to the 87th meeting together with the corresponding project completion reports (PCRs) and any remaining balances as at 31 December 2020; and
- (c) To request the Senior Monitoring and Evaluation Officer to work with the relevant implementing agency to ensure that the PCRs submitted for the CFC production, PU foam, refrigeration servicing, and solvent sector plans reflect disbursements to final beneficiaries, consistent with the information provided in the financial audit reports submitted to the **86th** meeting.

PART VII: SECTOR PLAN FOR THE PHASE-OUT OF METHYL BROMIDE (MB) PRODUCTION

Background

265. At its 84th meeting, the Executive Committee noted the report on the status of implementation of the sector plan for the phase-out of methyl bromide (MB) production in China, the update on the contract for the monitoring and supervision programme to be implemented by the Customs Authority, and the update regarding the MB labelling and traceability system, submitted by UNIDO; and requested the Government of China, through UNIDO, to include an update on the MB labelling and traceability system in the annual report on the status of implementation of the sector plan for the phase-out of MB production in China to be submitted at the 86th meeting (decision 84/40(a) and (b)).

266. On behalf of the Government of China, UNIDO submitted to the 86th meeting the requested progress report and update, in line with decision 84/40(a) and (b).

267. The Agreement between the Government of China and the Executive Committee specified a maximum annual allowable production of MB for controlled uses for 2015 and beyond of zero save for quarantine pre-shipment (QPS), feedstock and critical uses to be approved by the Parties. The Government of China did not submit a critical-use nomination for production for 2019. The 2019 verification report confirmed that China's production for controlled uses was zero; the Government reported no consumption of MB under Article 7 of the Montreal Protocol and under the country programme data report.

Verification of 2019 MB production

268. The production data verification for three MB producers was conducted in August 2020. The related 2019 production data were collected and verified, including: plant's identification, plant's history, plant's operation details, sales figures, and inventory at the beginning and end of the year. The verification team concluded that none of the three enterprises has produced MB for controlled uses.

Progress report

269. At its 82nd meeting, the Executive Committee noted the 2019-2021 work plan, which consists of near-term activities focused on monitoring and supervision of MB production in 2019 to 2021, and activities intended to ensure the long-term compliance through the establishment and implementation of MB monitoring and supervision programmes and tools.

270. FECO finalized the terms of reference to establish the MB labelling and traceability system and selected the Animal, Plant and Foodstuff Inspection Centre of Tianjin Customs to develop the system based on the existing production data reporting system. Each container of MB that was produced at the three MB producers would be labelled and tracked throughout its use for QPS or feedstock, thereby establishing a dynamic MB traceability production and consumption data management information system. In addition, the Centre will update the publication on principles and applied techniques of animal and plant quarantine treatment based on new research on MB alternatives and application methods (RMB 3,489,686).

271. The data survey of MB feedstock uses for 2017-2018 was delayed due to the COVID-19 pandemic; data for 2017-2019 was being collected and will be combined with data from 2020 for a 2017-2020 survey report that will be completed in 2021.

Secretariat's comments

272. No information was available on the 2014 case of illegal production of MB referred to in document UNEP/OzL.Pro/ExCom/84/22/Add.1 (decision 84/40(c)). In addition, no further information was available on whether atmospheric monitoring stations that may be established in Jiangsu, Shandong, Shanghai, and Zhejiang provinces, where feedstock use of MB was concentrated, would include instruments that can measure atmospheric abundances of MB.

Recommendation

273. The Executive Committee may wish to consider noting the report on the status of implementation of the sector plan for the phase-out of methyl bromide (MB) production in China, and the update regarding the MB labelling and traceability system submitted by UNIDO, contained in document UNEP/OzL.Pro/ExCom/86/21/Add.1.