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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Seventy-ninth Meeting
Bangkok, 3-7 July 2017

PROJECT PROPOSAL: EGYPT

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

Phase-out

- HCFC phase-out management plan (stage II, first tranche)

UNIDO, UNDP,
UN Environment, Government of
Germany

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Egypt

(I) PROJECT TITLE	AGENCY
HCFC phase-out plan (Stage II)	UNIDO (lead), UNDP, UN Environment, Germany

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2016	346.5 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2016	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-22		30.7		104.9	126.6				262.2
HCFC-123					0.1				0.1
HCFC-124									
HCFC-141b		80.5							80.5
HCFC-142b		1.6			2.2				3.8
HCFC-141b in imported pre-blended polyol		19.6							19.6

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	386.3	Starting point for sustained aggregate reductions:	484.61
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	174.00	Remaining:	310.61

(V) BUSINESS PLAN		2017	2018	2019	2020	After 2020	Total
UNIDO	ODS phase-out (ODP tonnes)	0	50.87	0	20.01	36.46	107.34
	Funding (US \$)	0	7,197,855	0	2,770,011	4,858,567	14,826,433
UNDP	ODS phase-out (ODP tonnes)	27.91	0	57.36	0	18.63	103.9
	Funding (US \$)	2,250,424	0	4,321,965	0	1,502,280	8,074,669
UN Environment	ODS phase-out (ODP tonnes)	0	4.0	8.0	2.0	4.0	18.0
	Funding (US \$)	0	394,473	0	197,236	394,473	986,182
Germany	ODS phase-out (ODP tonnes)	0	4.0	0	0	0	4.0
	Funding (US \$)	0	200,000	0	0	0	200,000

(VI) PROJECT DATA			2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Montreal Protocol consumption limits			347.64	347.64	347.64	251.08	251.08	251.08	251.08	251.08	125.54	n/a
Maximum allowable consumption (ODP tonnes)			347.64	289.70	289.70	251.08	251.08	251.08	251.08	251.08	125.54	n/a
Project costs requested in principle (US \$)	UNIDO	Project costs	3,921,047	0	1,073,714	0	391,827	0	391,827	0	218,426	5,996,841
		Support costs	274,473	0	75,160	0	27,428	0	27,428	0	15,290	419,779
	UNDP	Project costs	945,617	0	2,750,105	0	0	0	0	0	0	3,695,722
		Support costs	66,193	0	192,507	0	0	0	0	0	0	258,701
	UN Environment	Project costs	260,000	0	279,500	0	260,000	0	150,000	0	105,500	1,055,000
		Support costs	31,064	0	33,394	0	31,064	0	17,922	0	12,605	126,050
	Germany	Project costs	0	0	207,300	0	0	0	0	0	0	207,300
		Support costs	0	0	26,949	0	0	0	0	0	0	26,949
Total project costs requested in principle (US \$)			5,126,664	0	4,310,619	0	651,827	0	541,827	0	323,926	10,954,863
Total support costs requested in principle (US \$)			371,730	0	328,010	0	58,492	0	45,350	0	27,895	831,478
Total funds requested in principle (US \$)			5,498,394	0	4,638,630	0	710,319	0	587,177	0	351,821	11,786,341

(VII) Request for funding for the first tranche (2017)		
Agency	Funds requested (US \$)	Support costs (US \$)
UNIDO	3,921,047	274,473
UNDP	945,617	66,193
UN Environment	260,000	31,064
Germany	0	0

Funding request:	Approval of funding for the first tranche (2017) as indicated above
Secretariat's recommendation:	For individual consideration

PROJECT DESCRIPTION

1. On behalf of the Government of Egypt, UNIDO, as the lead implementing agency, has submitted to the 79th meeting stage II of the HCFC phase-out management plan (HPMP) at a total cost of US \$36,628,197, consisting of US \$26,230,231, plus agency support costs of US \$1,836,116 for UNIDO, US \$6,672,520, plus agency support costs of US \$467,076 for UNDP, US \$1,055,000, plus agency support costs of US \$137,150 for United Nations Environment Programme (UN Environment), and US \$207,300, plus agency support costs of US \$22,803 for the Government of Germany, as originally submitted. The implementation of stage II of the HPMP will phase out 199.26 ODP tonnes of HCFCs and assist Egypt in meeting the Montreal Protocol compliance target of 70 per cent reduction by 2025.

2. The first tranche for stage II of the HPMP being requested at this meeting amounts to US \$6,687,439, consisting of US \$4,481,664, plus agency support costs of US \$313,716 for UNIDO, US \$1,493,700, plus agency support costs of US \$104,559 for UNDP, and US \$260,000 plus agency support costs of US \$33,800 for UN Environment, as originally submitted. The Government of Germany is not requesting any funds for 2017.

Status of stage I

3. Stage I of the HPMP for Egypt was approved by the Executive Committee at its 65th meeting to meet 25 per cent reduction by 2018 at a total funding level of US \$8,520,815, plus agency support costs of US \$643,599. This included two foam projects to phase out 17.60 ODP tonnes of HCFC-141b at the amount of US \$892,840, plus agency support costs of US \$66,963 for UNIDO, as well as four foam projects to phase out 37.40 ODP tonnes of HCFC-141b at the amount of US \$1,479,000, plus agency support costs of US \$115,463 for UNDP, that had already been approved at the 62nd meeting and had subsequently been included in stage I. The first two tranches were approved at the 65th and 68th meetings at a total cost of US \$4,300,000 for UNDP and US \$1,290,000 for UNIDO, including agency support costs. The request for the third and final tranche (US \$1,020,148, including agency support costs) is expected to be submitted in 2018. An overview of the results achieved so far is included below.

Progress in implementation of stage I activities

ODS policy and regulation framework

4. The HCFC import licensing and quota system is operational since 2013. The National Ozone Committee establishes the annual import quotas, and the national ozone unit (NOU) approves importers and quantities in coordination with the Customs Authority. The Government will ban imports of HCFC-141b pre-blended polyols by 1 January 2018 in line with decision 65/38.

Conversion in the foam sector

5. The foam sector plan comprised conversions of individual enterprises as well as systems houses, to phase out 167.87 ODP tonnes of HCFC-141b:

- (a) Conversion of nine polyurethane (PU) foam enterprises (92.14 ODP tonnes): The conversion of six enterprises¹ (El-Araby, Mondial, MOG, Fresh, SECC, and Cairo Foam) to phase out 31.35 ODP tonnes of HCFC-141b and 23.65 ODP tonnes of HCFC-141b contained in imported pre-blended polyols have been completed by UNDP, with only the incremental operating cost (IOC) payments in process for three enterprises. The conversion at three additional enterprises (Kiriazi (domestic refrigeration manufacturing),

¹ A seventh enterprise (Delta Electric) was also approved for conversion at the 62nd meeting; due to change of ownership the project was cancelled and the associated funding returned in accordance with decision 65/38(a).

Refruck (rigid insulation for trucks and panels) and Al Fateh (sandwich panel)) have also been completed by UNIDO, with an associated phase-out of 21.16 ODP tonnes of HCFC-141b and 15.96 ODP tonnes of HCFC-141b contained in imported pre-blended polyols; and

- (b) Conversion of four systems houses and downstream users (75.74 ODP tonnes): Three systems houses (Dow, Obeigi, and Technocom) have signed agreements and completed the in-house systems technology development; one of those (Technocom) also completed its in-house conversion. The fourth systems house (Baalbaki) has yet to sign an agreement. Through the systems houses, 81 small- and medium-sized enterprises (SMEs) and 350 “micro” users will be converted.

Refrigeration servicing sector

6. A kick-off meeting for the servicing sector activities was held in Cairo in May 2013 to raise awareness and discuss non-ODS alternatives. The Egyptian Programme for Promoting Low-GWP Refrigerants’ Alternatives (EGYPRA) initiative was launched in 2014 as part of the enabling activities for the air-conditioning (AC) sector to assess low-global warming potential (GWP) alternatives. Two meetings were held with AC manufacturers and technology suppliers, components and refrigerant samples have been provided to manufacturers to build prototypes, and some prototypes have been completed. The next step is to test the performance of the prototypes.

Project implementation and monitoring unit (PMU)

7. The PMU has provided support to the NOU in implementing the HPMP activities; visiting enterprises to review projects; developing technical specifications; and ensuring financial control of the funds according to UNIDO’s rules and regulations.

Status of disbursements

8. As of April 2017, of the total funds of US \$7,571,840 so far approved, US \$4,513,339 (60 per cent) have been disbursed. The remaining US \$3,058,501 will be disbursed between 2017 and 2018. The third and final tranche is expected to be requested in 2018.

Stage II of the HPMP

9. The Government of Egypt would commit in stage II to reduce HCFC consumption by 70 per cent of the baseline by 2025, with an associated phase-out of 199.26 ODP tonnes to achieve a complete phase-out of HCFC-141b through the conversion of all PU foam manufacturing enterprises; the conversion of five enterprises in the domestic AC sector, three enterprises in the commercial AC sector, 14 enterprises in the commercial refrigeration sector; and four enterprises in the extruded polystyrene (XPS) foam sector to low-GWP alternatives; assistance to the refrigeration servicing sector; the establishment of a hydrocarbon (HC) refrigerant manufacturing facility; and implementation and monitoring.

Remaining eligible consumption in Egypt

- 10. Stage I proposed the phase-out of 174 ODP tonnes as shown in Table 1. It included:
 - (a) 95.69 ODP tonnes of HCFC-141b and 72.18 ODP tonnes of HCFC-141b contained in imported pre-blended polyols; and
 - (b) 6.13 ODP tonnes of HCFC-22 associated with the servicing sector component.

11. In addition, the Executive Committee approved a demonstration project on low-cost options for the conversion to non-ODS technologies in PU foams at very small users approved at the 76th meeting and decided to deduct 4.4 ODP tonnes of HCFC-141b from the remaining HCFC consumption eligible for funding under stage II (decision 76/30).

Table 1. Overview of the remaining HCFC consumption in Egypt

Substance	Starting point		Reduction in stage I		Remaining		Stage II proposed		Remaining after stage II	
	ODP	MT	ODP	MT	ODP	MT	ODP	MT	ODP	MT
HCFC-123	0.11	5.50	0.00	0.00	0.11	5.50	0.00	0.00	0.11	5.50
HCFC-141b	129.61	1,178.27	95.69	869.91	29.52*	268.36*				
HCFC-141b in imported polyol	98.34	894.00	72.18	656.18	26.16	237.82	57.92**	526.58**	0.00	0.00
HCFC-142b	16.36	251.69	0.00	0.00	16.36	251.69	2.48	38.19	13.88	213.50
HCFC-22	240.19	4,367.09	6.13	111.45	234.06	4,255.64	138.85	2,524.62	95.21	1,731.02
Total	484.61	6,696.56	174.00	1,637.55	306.21	5,019.01	199.26	3,089.39	106.95	1,929.62

* After deducting 4.4 ODP tonnes of HCFC-141b from the remaining HCFC consumption eligible for funding under stage II, in accordance with decision 76/30.

** Includes consumption not eligible for funding.

HCFC consumption and sector distribution

12. The Government of Egypt reported a consumption of 346.53 ODP tonnes of HCFC in 2016 and an additional 19.56 ODP tonnes of HCFC-141b contained in imported pre-blended polyols. The 2012-2016 HCFC consumption is shown in Table 2.

Table 2. HCFC consumption in Egypt (2012-2016 Article 7 data)

HCFC	2012	2013	2014	2015	2016	Baseline
Metric tonnes						
HCFC-22	4,934.5	3,416.49	3,172.59	4,038.97	4,767.59	4,367.16
HCFC-123	0	24.48	0	9.07	5.00	5.25
HCFC-124	0.15	1.68	0.272	2.70	0.00	0
HCFC-141b	2,043.4	906.34	1,238.78	1,072.75	731.53	1,178.26
HCFC-142b	270.8	136.45	146.49	42.04	57.53	251.69
Sub-total (mt)	7,248.85	4,485.44	4,558.13	5,165.53	5,561.65	5,802.36
HCFC-141b in imported pre-blended polyols*	613.02	155.61	120.00	100.00	177.80	894.00**
Total (mt)	7,861.87	4,641.05	4,678.13	5,265.53	5,739.45	6,696.76
ODP tonnes						
HCFC-22	271.40	187.91	174.49	222.14	262.22	240.19
HCFC-123	0	0.49	0	0.18	0.10	0.11
HCFC-124	0.003	0.04	0.01	0.06	0.00	0.00
HCFC-141b	224.77	99.70	136.27	118.00	80.47	129.61
HCFC-142b	17.60	8.87	9.52	2.73	3.74	16.36
Sub-total (ODP tonnes)	513.77	297.01	320.29	343.12	346.53	386.27
HCFC-141b in imported pre-blended polyols*	67.43	17.12	13.20	11.00	19.56	98.34**
Total (ODP tonnes)	581.20	314.13	333.49	354.12	366.09	484.64

* Data from country programme (CP) implementation report

**Starting point for aggregate reductions in consumption

13. It appears that the political unrest in 2013 and 2014 likely contributed to a reduction in consumption relative to the baseline. Consumption in 2016 was 10 per cent below baseline, in line with Egypt's Agreement with the Executive Committee. Manufacturing, including the XPS foam, PU foam, and refrigeration and air-conditioning (RAC) manufacturing sectors, account for the majority (65 per cent) of Egypt's consumption, with refrigeration servicing accounting for the rest (35 per cent).

14. Table 3 presents the consumption of HCFCs by sector as reported in the CP data for 2016. Consumption has been reported in the foam and refrigeration sectors only.

Table 3. HCFC sector consumption in Egypt (2016)

HCFC	Foam	Refrigeration manufac- turing	Refrigeration servicing	Total
Metric tonnes				
HCFC-22	558.18	1,907.28	2,301.82	4,767.2
HCFC-123	0	0	5.0	5.0
HCFC-141b	731.82	0	0	731.82
HCFC-142b	24.62	0	33.85	58.47
Sub-total (mt)	1,314.62	1,907.28	2,340.67	5,562.57
HCFC-141b in imported pre-blended polyols	178.18	0	0	178.18
Total (mt)	1,492.8	1,907.28	2,340.67	5,740.75
ODP tonnes				
HCFC-22	30.7	104.9	126.6	262.2
HCFC-123	0	0	0.1	0.1
HCFC-141b	80.5	0	0	80.5
HCFC-142b	1.6	0	2.2	3.8
Sub-total (ODP tonnes)	112.8	104.9	128.9	346.6
HCFC-141b in imported pre-blended polyols	19.6	0	0	19.6
Total (ODP tonnes)	132.4	104.9	128.9	366.2

15. Consumption of HCFC-141b in bulk and contained in imported pre-blended polyols decreased due to the implementation of conversion projects under stage I, with further reductions expected with implementation of the remaining stage I conversions. This decrease was more pronounced for HCFC-141b in bulk, while consumption of HCFC-141b contained in imported pre-blended polyols increased in 2016 relative to the previous three years due to market prices. In addition, some systems houses export pre-blended polyols containing HCFC-141b; this export is not reflected in Egypt's Article 7 or CP report. Egypt exported 103 metric tonnes (mt) of HCFC-141b contained in pre-blended polyols in 2016; no such export was reported in 2007-2009, when the starting point for the substance was established. Consumption of HCFC-142b fell dramatically (77 per cent) from the baseline due to changes in the blowing agent formulations used for XPS foam, with consumption of HCFC-22 increasing for that purpose.

HCFC consumption in manufacturing sectors

PU foam manufacturing

16. Table 4 presents an estimate of the distribution the consumption of HCFC-141b in the foam sector at enterprises not assisted under stage I in domestic refrigeration, water heaters, and cold storage, commercial refrigeration and other small manufacturers for 2015.²

² The survey used to prepare the stage II submission was conducted in 2015, as stage II of the HPMP was initially submitted to the 76th meeting and subsequently withdrawn. Therefore, 2015 consumption was used as the basis for the submission.

Table 4. Estimated distribution of HCFC-141b consumption for 2015 for applications in rigid PU foam in enterprises not assisted under stage I

Application	Number of enterprises	Consumption	
		mt	ODP tonnes
Domestic refrigeration	8	401.8	44.20
Water heaters	2	43.7	4.81
Remaining small rigid foams applications not covered in stage I	38	81.1	8.92
Sector sub-total	48	526.6	57.93
Exported polyol	4	100.0	11.00

XPS foam manufacturing

17. Four XPS manufacturing enterprises were identified that had a 2013-2015 average consumption of 38.19 mt of HCFC-142b and 405.52 mt of HCFC-22. XPS foam is used in the food and construction industry.

RAC manufacturing sector

18. *Commercial refrigeration manufacturing:* The commercial refrigeration manufacturing sector comprises one large manufacturer (MIRACO Carrier, 37 per cent non-Article 5 owned), 39 registered enterprises, and 187 small service shops that assemble and charge a variety of refrigeration equipment, including supermarket display coolers, cold store, commercial and domestic deep freezers, commercial display cabinets, blast freezers, ice plants, ice makers, drinking water coolers, and chillers for low temperature applications. The estimated consumption of the sector in 2015 is approximately 350 mt of HCFC-22.

19. *AC manufacturing:* The AC manufacturing sector is dominated by the domestic AC sector, which comprises seven enterprises that manufacture split AC units with capacity between 9,000 and 64,000 British thermal unit (BTU)/h (0.75 and 5.33 tonnes of refrigeration (TR)). Most enterprises manufacture both HCFC-22 and R-410A-based equipment. In the commercial AC sector, four enterprises manufacture a range of products based on HCFC-22, R-410A and R-407 with a cooling capacity of 60,000 BTU/h (5 TR) and higher. The estimated consumption of the AC manufacturing sector in 2015 is approximately 1,881 mt of HCFC-22.

HCFC consumption in the refrigeration servicing sector

20. The refrigeration servicing sector corresponds to 33 per cent of HCFC-22 consumption in Egypt in 2015. In addition, 17.44 mt of HCFC-142b were consumed for servicing in 2015, most likely as a component of R-406a, a blend (55 per cent HCFC-22, 4 per cent R-600a, and 41 per cent HCFC-142b) used as a drop-in for CFC-12-based equipment. This consumption accounted for 41 per cent of the HCFC-142b consumption in the country in 2015.

Proposed activities in stage II of the HPMPActivities in the manufacturing sector*PU foam manufacturing sector*

21. Stage II proposed to phase out the remaining eight enterprises manufacturing domestic refrigerators consuming 401.8 mt (44.20 ODP tonnes) of HCFC-141b to cyclopentane technology.³ Where feasible, a third mixing head stream that allows the direct injection of the cyclopentane, and thus

³ Based on 2015 consumption as the survey used for the preparation of stage II was conducted in 2015.

obviates the need for a pre-mixer, will be used.⁴ Funding is requested for dispenser replacement or retrofit, depending on which is more cost-effective; safety-related equipment and audit; technical assistance; trials and commissioning; and contingencies. No IOCs were requested. The total cost of the sub-sector as submitted was US \$3,821,360 (US \$9.51/kg), noting that quantity of HCFC-141b used in bulk and in imported pre-blended polyols cannot be separately identified for the beneficiary enterprises as enterprises decide to blend in-house or purchase pre-blended polyols based on market prices, may change that decision multiple times per year, and do not track such consumption separately. Given that all HCFC-141b will be phased out in stage II, an umbrella project approach was used, whereby smaller enterprises may have a cost-effectiveness (CE) no more than 100 per cent above the CE threshold given that the sub-sector CE was within the threshold.

22. Stage II also proposed the conversion of two enterprises (Kiriazi Gas Company and Electrostar) that manufacture electric water heaters and consume 43.7 mt (4.81 ODP tonnes) of HCFC-141b, and the conversion of 38 SMEs that consume 81.1 mt (8.92 ODP tonnes) of HCFC-141b through assistance to the systems house (Beta Technical and Trading Bureau).⁵ The two electric water heater manufacturers will convert to cyclopentane as the enterprises have experience with this alternative in their (separate) refrigeration manufacturing lines. Funding is requested for dispenser replacement (US \$120,000/dispenser) or retrofit (US \$40,000/retrofit); safety-related equipment and audit; technical assistance (US \$20,000); trials and commissioning (US \$10,000); and contingencies. No IOCs were requested. The 38 SMEs will be converted to methyl formate (MF). Funding was requested at the systems house for project management (US \$1,000/down-stream user), technology development (US \$30,000), trials, testing and training (US \$3,000/down-stream user), and contingencies. For the down-stream customers, for retrofit packages depending on the baseline equipment (US \$5,000-US \$15,000, depending on equipment type), contingencies, and IOCs.

23. The total funding requested for these three sub-projects amounts to US \$1,467,220 (US \$11.76/kg), as shown in Table 5. In the case of one enterprise (Siltal), the CE was more than twice the CE threshold so the requested funding was adjusted.

Table 5. Total cost for the conversion of HCFC-141b in the PU foam sector

Enterprise	Applications	Technology	mt	ODP tonnes	Incremental capital cost (ICC) (US \$)	IOC (US \$)	Total (US \$)	Requested funding (US \$)	CE
Bahgat	Domestic refrigeration manufacturing	cyclopentane	14.3	1.57	231,000	0	231,000	231,000	16.15
Everest	Domestic refrigeration manufacturing	cyclopentane	74.3	8.17	308,000	0	308,000	308,000	4.15
Fresh	Domestic refrigeration manufacturing	cyclopentane	102.0	11.22	874,500	0	874,500	874,500	8.57
Ocean	Domestic refrigeration manufacturing	cyclopentane	16.0	1.76	225,500	0	225,500	225,500	14.09
Siltal	Domestic refrigeration manufacturing	cyclopentane	15.0	1.65	429,000	0	429,000	328,860	21.92
Star	Domestic refrigeration manufacturing	cyclopentane	55.0	6.05	588,500	0	588,500	588,500	10.70

⁴ Further details on the third mixing head stream can be found in UNEP/OzL.Pro/ExCom/75/20.

⁵ Based on 2015 consumption as the survey used for the preparation of stage II was conducted in 2015.

Enterprise	Applications	Technology	mt	ODP tonnes	Incremental capital cost (ICC) (US \$)	IOC (US \$)	Total (US \$)	Requested funding (US \$)	CE
TopMaker	Domestic refrigeration manufacturing	cyclopentane	27.2	2.99	467,500	0	467,500	467,500	17.19
Tredco	Domestic refrigeration manufacturing	cyclopentane	98.0	10.78	797,500	0	797,500	797,500	8.14
Kiriazzi	Water heater	cyclopentane	18.7	2.06	176,000	0	176,000	176,000	9.41
Electrostar	Water heater	cyclopentane	25	2.75	418,000	0	418,000	418,000	16.72
38 SMEs	Various	MF	81.1	8.92	799,700	73,520	873,220	873,220	10.77
Total			526.6	57.92	5,315,200	73,520		5,388,720	10.23
Funds requested			526.6	57.92	5,315,200	73,520		5,288,580	10.04

XPS foam manufacturing sector

24. Four XPS manufacturers with an average 2013-2015 HCFC consumption between 55 and 198 mt will convert to a 60/40 blend of HFO-1234za and dimethyl ether (DME). Funding is requested for retrofit of the extruder feed screws (US \$40,000/screw and US \$50,000 for secondary screw re-engineering for Modern Plastics), DME storage tanks (US \$75,000/tank) and feed pumps (US \$50,000/pump), safety related equipment and audit (between US \$55,000-US \$145,000 depending on the enterprise), local works (US \$20,000/extruder), technical assistance (US \$25,000/extruder), trials (between US \$40,000-US \$60,000 depending on the enterprise), contingencies and IOCs as shown in Table 6.

Table 6. Total cost for the conversion of the XPS foam sector

Enterprise	mt	ICC (US \$)	IOC (US \$)	Total (US \$)	CE (US \$/kg)
CMB	98	836,000	313,600	1,149,600	11.73
Insutech	198	522,500	633,600	1,156,100	5.84
Chema-Foam	55	335,500	176,000	511,500	9.30
Modern Plastics	93	390,500	297,600	688,100	7.40
Total	444	2,084,500	1,420,800	3,505,300	7.89

Domestic AC manufacturing sector

25. The project aims to build on the EGYPRA and the demonstration project on promoting low-GWP refrigerants for AC sectors in high-ambient temperature countries (PRAHA) and phase out 1,218.69 mt⁶ (67.03 ODP tonnes) of HCFC-22 in five residential AC manufacturers from HCFC-22 to an alternative low-GWP technology that is yet to be decided. The project includes conversion of AC equipment assembly lines and conversion of four heat exchange manufacturing lines at the enterprises. Funding is requested for technical assistance (US \$100,000/enterprise), heat exchanger modification (US \$1,358,000/line), refrigerant handling packages (between US \$90,000 and US \$390,000, depending on the number of charging machines, leak detectors and ancillary equipment needed), safety measures (between US \$155,000 and US \$170,000, depending on the enterprise layout), refrigerant supply (between US \$45,000 and US \$120,000, depending on the number of supply pumps, tanks, and piping needed), repair line modifications (US \$25,000, as needed), performance test station modifications (US \$2,000/station), upgrade of labs to handle flammables (US \$10,000/lab), installation (5 per cent), TÜV certification (US \$35,000), and contingencies (10 per cent). The total funding requested, including the heat exchange conversion, amounts to US \$18,038,567 (US \$14.80/kg), as shown in Table 7.

⁶ Based on 2015 consumption as the survey used for the preparation of stage II was conducted in 2015.

Table 7. Investment projects in the AC manufacturing sector

Enterprise	HCFC-22 consumption		ICC (US \$)	IOC (US \$)	Funds requested (US \$)	CE (US \$/kg)
	mt	ODP tonnes				
El-Araby	306.58	16.86	2,578,427	1,931,454	4,509,881	14.71
Fresh	88.00	4.84	2,409,825	554,400	2,964,225	33.68
Miraco-Carrier	316.25	17.39	1,345,633	1,992,375	3,338,008	10.55
Power	45.00	2.48	545,985	283,500	829,485	18.43
Unionaire	462.86	25.46	3,480,950	2,916,018	6,396,968	13.82
Total	1,218.69	67.03	10,360,820	7,677,747	18,038,567	14.80

Commercial AC manufacturing sector

26. Building on the results of EGYPRA and PRAHA, three enterprises (EGAT, Volta, and Delta Construction and Manufacturing (DCM)) that manufacture central AC equipment for light commercial and residential use will convert to yet-to-be-determined low-GWP alternatives for equipment below approximately 144,000 BTU/h (12 TR). For larger capacity systems, a conversion to exclusively low-GWP alternatives is difficult given the charge of refrigerant which cannot be covered, currently or in the near future, with a standard that would allow the use of flammable refrigerants. Therefore, larger capacity equipment would be converted to a combination of low-GWP alternatives and indirect evaporative cooling (IEC), which is a non-vapour compression technology. While IEC technology is currently available at a commercial level, with a significant elimination of refrigerant use and reduction of energy consumption, it has not yet been integrated with direct-expansion refrigeration technology. The integration of those two technologies can be a long-term solution for this sector given that additional cost of integrating IEC can be absorbed within the overall cost of the unit and the significant reduction in energy consumption.

27. All three enterprises are participating in EGYPRA, and the enterprises have already built some prototypes but additional testing is required. Technical assistance will be provided to the enterprises for the redesign of the products using the selected low-GWP, high energy-efficient alternatives or technology. Assistance assessing the market acceptance to the new products will also be provided. The three enterprises consumed 14.23 mt (0.78 ODP tonnes) of HCFC-22; in addition, an associated 44 mt (2.42 ODP tonnes) of HCFC-22 used for servicing would be phased out. The estimated cost of the conversion is US \$370,000 (US \$6.35/kg) as shown in Table 8.

Table 8. Assistance for the commercial AC sector

Activity	Cost (US \$)
Technical assistance for redesigning and building the prototypes	90,000
Building prototypes:	100,000
A- Prototypes with low-GWP refrigerants for range of applications less than 12 TR	
B- New prototypes with combined IEC/direct-expansion systems for range of applications 12-40 TR	
Prototypes testing and evaluating results at independent testing facility	80,000
Prototypes for field testing, including building, installation, monitoring and collecting feedback	50,000
Financial, market and regulatory evaluation and feasibility assessment	50,000
Total	370,000

Commercial refrigeration manufacturing sector

28. The project aims to phase out 9.8 mt (0.54 ODP tonnes) of HCFC-22 in 14 commercial refrigeration manufacturing enterprises and an additional 58.2 mt (3.20 ODP tonnes) of HCFC-22 in 25 registered enterprises and 187 small service shops that assemble and charge a variety of equipment.⁷

⁷ Based on 2015 consumption as the survey used for the preparation of stage II was conducted in 2015.

Enterprises in this sector, as well as imported equipment used for those applications, consume HCFC-22 and HFCs, mainly R-404A and HFC-134a. The project includes technical assistance, tools to convert to a low-GWP alternative that is yet to be identified, and training at an estimated cost of US \$210,304 (US \$3.09/kg)

HC production

29. Stage II proposed the establishment of a facility for the commercial production of HC refrigerants. Through a separation and purification process, the facility would produce propane (HC-290) and isobutane (R-600a) using locally-sourced liquefied petroleum gas. This is expected to result in ODS phase-out and facilitate the introduction of low-GWP refrigerants by providing a local, cost-effective source of refrigerant-grade HC refrigerants for use in RAC sector. Based on the demonstration project in Nigeria,⁸ the project cost is approximately US \$5 million. A total of US \$1.5 million is requested from the Multilateral Fund for designs, supervision, testing, trials and safety; the remaining costs would be covered through an investment partnership from refrigerant bottlers, distributors, feedstock supplier(s) and a Development Bank.

Activities in the refrigeration servicing sector

30. Stage II of the HPMP proposed to phase out 818.80 mt (45.0 ODP tonnes) of HCFC-22 used in the refrigeration servicing sector with a total cost of US \$3,732,300 through the following activities to be implemented by UNIDO, UN Environment and the Government of Germany:

- (a) Policy update and enforcement for controlling and monitoring the use of HCFC-22, including training 800 customs officers and market surveillance for preventing illegal and contaminated refrigerant sales in the market through coordination, training of Consumer Protection Agency officers who monitor local markets and take legal action against illegal goods, and for strengthening of information sharing and reporting of seized illegal goods to create a process of tracing the source. The project will provide the necessary infrastructure through stage II after which the Government will handle the project in a sustainable manner (US \$455,000);
- (b) Two workshops for policy makers and six trainings for trainers and technicians for approximately 160 participants on the safe use of HC-refrigerants and equipment (including tools, personal protective equipment, HC-based demonstration units) for the vocational training centre (VTC) (US \$207,300);
- (c) Upgrade of national codes of practice, development of a certification scheme, support to establish two master training centres and upgrade the technical capacity of 16 VTCs, update training curricula, and training and certification of 1,500 technicians. Given that the technologies to be adopted in the AC sector is uncertain, the training and certification programme will include theoretical and hands-on training that covers flammable refrigerants, and good practices to minimize emissions, thus helping ensure the sustainability of the training programme (US \$490,000);
- (d) Reviewing and upgrading local codes and standards for equipment, containers, buildings, insulation, RAC equipment, and training and outreach programmes for the standards and codes, thereby ensuring timely adoption of relevant international standards and the timely introduction of alternatives and related services. The Egyptian Standardization Organization reviews, and if necessary modifies, and translates each standard for local adoption. The project will support efforts in adoption of international standards through

⁸ UNEP/OzL.Pro/ExCom/62/43

the national process. In addition, a refrigerant containment and leakage prevention programme will be implemented, focused on large RAC equipment (US \$270,000);

- (e) Awareness and outreach on alternate refrigerant technologies and green procurement training for the public sector (US \$100,000);
- (f) Development of local guidelines for reclamation facilities, and establishment of a national reclamation scheme comprising three reclamation centres including testing labs, 1,000 recovery units along with tools and necessary accessories, capacity-building of more than 100 after-sales and certified service centres, and an on-site training programme for workshops. The initiation of this programme will help industry progressively recover and reclaim HCFCs. The programme is designed to ensure the purity of recovered and reclaimed refrigerants, and will be supported by a training and certification programme, including the ban on imports or use of refrigerants in non-refillable containers, after necessary stakeholder consultations on timing; ban on venting refrigerants during servicing; and mandatory licensing of all establishments (e.g., importers, distributors, retailers, service workshops) dealing with and handling ODS (US \$2,090,000); and
- (g) Technical advisory support, including international consultancy services and field trips on adoption of low-GWP alternative technologies (US \$120,000).

Implementation and monitoring activities

31. The project management will be divided into two components, one relating to UNIDO and the other to UNDP, for managing the respective project activities. The UNIDO component would oversee all project activities and overall coordination. The funding for the UNIDO and UNDP components amount to US \$1,320,000 and US \$200,000, respectively.

Total cost of stage II of the HPMP

32. The total cost of stage II of the HPMP for Egypt to be funded through the Multilateral Fund has been estimated at US \$34,165,051, as originally submitted (excluding support costs). The proposed phase-out activities will result in the phase-out of 199.26 ODP tonnes of HCFCs representing 52 per cent of the HCFC baseline with an overall CE of US \$10.90/kg. Detailed activities and cost break-down, as originally submitted, are shown in Table 9:

Table 9. Summary of proposed activities and cost of stage II of the HPMP for Egypt

Sector	Application	Substance	mt	ODP tonnes	Funds requested (US \$)	CE (US \$/kg)
PU foam	Domestic refrigeration manufacturing	HCFC-141b	401.8	44.20	3,821,360	9.51
	Insulating foam	HCFC-141b	124.78	13.73	1,467,220	11.76
XPS foam	XPS manufacturers	HCFC-142b	38.19	2.48	3,505,300	7.90
		HCFC-22	405.52	22.3		
Sub-total foam			970.29	82.71	8,793,880	9.06
RAC manufacturing	Commercial refrigeration	HCFC-22	68	3.74	210,304	3.09
	Domestic AC manufacturing	HCFC-22	1,218.69	67.03	18,038,567	14.80
	Commercial AC manufacturing	HCFC-22	58.23	3.2	370,000	6.35
Sub-total RAC manufacturing			1,344.92	71.55	18,618,871	13.84

Sector	Application	Substance	mt	ODP tonnes	Funds requested (US \$)	CE (US \$/kg)
	RAC servicing	HCFC-22	818.18	45.00	3,732,300	4.56
	HC production				1,500,000	
PMU	UNIDO component				1,320,000	
	UNDP component				200,000	
Sub-total PMU					1,520,000	
Total stage II			3,133.39	199.26	34,165,051	10.90

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

33. The Secretariat reviewed stage II of the HPMP for Egypt in light of stage I, the policies and the guidelines of the Multilateral Fund, including the criteria for funding HCFC phase-out in the consumption sector for stage II of HPMPs (decision 74/50), and the 2017-2019 business plan of the Multilateral Fund.

Verification

34. Although not required, a 2015 verification report was submitted that confirmed that Egypt is implementing a licensing and quota system for imports and exports of HCFCs and that consumption of HCFCs in 2015 was in compliance with the Montreal Protocol and the consumption targets established under stage I.

Overarching strategy for stage II

35. The Secretariat noted the comprehensive strategy proposed by the Government of Egypt. The conversions of the manufacturing enterprises proposed under stage II would all be to low-GWP alternatives, including in the RAC, the PU foam, and XPS foam sectors. Those conversions would be complemented by activities in the servicing sector, including on building capacity related to flammable and toxic low-GWP alternatives. The objectives of Egypt's HPMP include meeting the HCFCs compliance targets, maximizing the climate benefits while phasing out HCFCs, and leapfrogging, as feasible, high-GWP alternatives.

Proposed activities in stage II

PU foam manufacturing sector

36. As the phase-out for which funding was requested was greater than the remaining consumption eligible for funding, and noting that consumption of HCFC-141b in bulk and contained in pre-blended polyols could not be distinguished at the enterprises, the proposal was adjusted to ensure that funding was requested only within the remaining consumption eligible for funding. As the consumption of HCFC-141b contained in imported pre-blended polyols is higher in 2016 (19.56 ODP tonnes) relative to 2015 (11.00 ODP tonnes), and Egypt's remaining consumption eligible for funding is limited by this quantity, the proposal was adjusted to use the 2016 rather than 2015 consumption at the enterprises as the basis to determine eligible costs and phase-out. On this basis, Egypt's remaining consumption of total HCFC-141b (i.e., both in bulk and contained in imported pre-blended polyols) is 49.08 ODP tonnes as shown in Table 10.

Table 10. Total* HCFC-141b consumption eligible for funding

		HCFC-141b	HCFC-141b in pre-blended polyols	Total
Starting point	ODP	129.61	98.34	227.95
	mt	1,178.27	894.00	2,072.27
Stage I	ODP	95.69	72.18	167.87
	mt	869.91	656.18	1,526.09
Demonstration project (decision 76/30)	ODP	4.40	-	4.40
	mt	40.00	-	40.00
Remaining	ODP	29.52	26.16	55.68
	mt	268.36	237.82	506.18
2015 consumption	ODP	118.00	11.00	129.00
	mt	1,072.75	100.00	1,172.75
2016 consumption	ODP	80.47	19.56	100.03
	mt	731.53	177.80	909.33
Total* HCFC-141b consumption eligible for funding				
2015 basis	ODP			40.52
	mt			368.36
2016 basis	ODP			49.08
	mt			446.16

* Total is the sum of bulk HCFC-141b and HCFC-141b contained in imported pre-blended polyols.

37. The 2016 consumption of the eight domestic refrigeration manufacturing enterprises was 462.5 mt (50.88 ODP tonnes), and the consumption of the 38 SMEs was 74.22 mt (8.16 ODP tonnes). As this consumption was above Egypt's remaining consumption eligible for funding of 446.16 mt (49.08 ODP tonnes)⁹, the Government proposed not to request funding for the conversion of one enterprise in the domestic refrigeration manufacturing sector (Everest, with consumption of 90 mt of HCFC-141b in 2016) and of 10 SMEs (with consumption of 24.43 mt of HCFC-141b in 2016), bringing the total phase-out of HCFC-141b for which funding was requested in the domestic refrigeration manufacturing sub-sector to 372.50 mt (40.98 ODP tonnes) and 99.79 mt (10.98 ODP tonnes) in the remaining PU insulating foam sub-sector, for a total of 472.29 mt (51.95 ODP tonnes), on the understanding that the Government would have flexibility to allocate funding to the eligible enterprises for which funding was not requested, if deemed necessary during implementation. Any additional funding that would be required for the conversions will be covered by the enterprises. The Secretariat considers that providing flexibility to use funding for the eligible enterprises would help ensure the smooth phase-out of HCFC-141b in the country and supports this request.

38. On this basis, the Secretariat and the implementing agencies discussed the proposed costs of the conversion and the following adjustments were agreed: funding to convert or replace equipment purchased after the 21 September 2007 cut-off date was removed; equipment that was past its useful life was reduced in accordance with decision 18/25; the cost of dispenser retrofit (US \$60,000) and technical assistance (between US \$10,000 and US \$30,000, depending on the enterprise) was adjusted; and although incremental operating savings were expected, it was agreed on an exceptional basis to set the IOCs to zero. The agreed cost of the conversions in the domestic refrigeration manufacturing sub-sector amounted to US \$3,327,500 and in the remaining PU foam sub-sector US \$1,227,600. As the remaining consumption of HCFC-141b in bulk and contained in pre-blended polyols eligible for funding, adjusted for the 2016 imports of HCFC-141b contained in pre-blended polyols, was 446.16 mt (49.08 ODP tonnes), the agreed funding was adjusted accordingly, resulting in an agreed eligible funding of US \$3,036,641 for the domestic refrigeration manufacturing sub-sector and US \$967,352 for the remaining PU foam sub-sector. It was agreed that the date of establishment of the 28 SMEs would be confirmed during implementation given the standard clause to the Agreement specifying that any

⁹ Including both bulk HCFC-141b and contained in imported pre-blended polyols, after accounting for the 2016 imports of HCFC-141b contained in imported pre-blended polyols.

enterprise found to be ineligible would not receive financial assistance, and that this information would be reported as part of the Tranche Implementation Plan.

39. The Government of Egypt agreed to implement a ban on the import, use and export of HCFC-141b in bulk and export of HCFC-141b contained in pre-blended polyols by 1 January 2020, and re-affirmed its commitment to ban the import of HCFC-141b contained in imported pre-blended polyols by 1 January 2018. Table 11 contains the agreed activities and costs for the PU foam sector.

Table 11. Agreed activities and costs for the PU foam sector

Enterprises	HCFC-141b (mt)*	Cost (US \$)	Requested funding (US \$)	CE (US \$/kg)
Bahgat	32.5	275,000	259,787	7.99
Fresh	130	808,500	763,775	5.88
Ocean	7	159,500	144,978	20.71
Siltal	17	429,000	352,090	20.71
Star	60	588,500	555,945	9.27
TopMaker	16	401,500	331,379	20.71
Tredco	110	665,500	628,686	5.72
Kiriazzi	18	165,000	155,872	8.66
Electrostar	32	352,000	295,874	9.25
28 SMEs	49.79	710,600	515,605	10.36
Sub-total	472.29	4,555,100	4,003,993	8.48
Everest	90	n/a	0	n/a
10 SMEs	24.43	n/a	0	n/a
Total	586.72	4,555,100	4,003,993	6.82

* 2016 consumption

XPS manufacturing sector

40. The Secretariat sought clarification on the consumption by substance at each enterprise. UNDP clarified that previously, the XPS manufacturing sector used a mixture of 75-80 per cent of HCFC-142b and 20-25 per cent of HCFC-22 to mitigate the modest flammability of HCFC-142b. Due to the lower price of HCFC-22, manufacturers have changed their formulation to exclusively using HCFC-22 or a blend with HCFC-142b (approximately 20 to 40 per cent), depending on the technical capability of the enterprises and customer quality requirements. Currently, one enterprise consumes both HCFC-142b and HCFC-22, while the other three enterprises consume exclusively HCFC-22. Given the changes in consumption at the enterprises, it was agreed to use the 2016 consumption as the basis for the project.

41. The proposal notes that some interim use of HFCs might be needed given the pricing and supply situation of HFO-1234ze. The Secretariat would not recommend an interim use of high-GWP HFCs for this use as the conversion is not required to meet Egypt's HCFC compliance obligations given the other reductions proposed under stage II. In addition, in line with decision 72/40, the Secretariat sought detailed information from the suppliers on how and when an adequate supply of the technology would be made available to the country. It was agreed to shift the funding for the XPS foam sector to the second tranche of stage II (expected in 2019) to allow sufficient time for the alternative to be available in the country and ensure that HFCs would not be used in the interim. Confirmation was received that the alternative would be available.

42. On this basis, the Secretariat and UNDP discussed the cost of the conversion and agreed to adjust the cost of technical assistance (US \$22,500/extruder except for the enterprise that had three extruders where a total of US \$60,000 was agreed), trials and testing (US \$30,000-US \$40,000, depending on the enterprise), storage tanks (US \$65,000/tank), ventilation (US \$15,000/extruder), and local works (US \$15,000/extruder); in addition, the level of IOCs was adjusted in accordance with decision 74/50 as shown in Table 12.

Table 12. Agreed activities and costs for the XPS foam sector

Enterprise	HCFC-142b		HCFC-22		ICC (US \$)	IOC (US \$)	Total cost (US \$)	Eligible Funding (US \$)	CE (US \$/kg)
	mt	ODP tonnes	mt	ODP tonnes					
CMB	24.3	1.58	49.0	2.70	742,500	102,620	845,120	845,120	11.53
Insuthec	0.0	0.0	300.0	16.50	473,000	420,000	893,000	893,000	2.98
Chema-Foam	0.0	0.0	10.0	0.55	299,750	14,000	313,750	205,500	20.55
Modern Plastics	0.0	0.0	200.0	11.00	354,750	280,000	634,750	634,750	3.17
Total	24.3	1.6	559.0	30.7	1,870,000	816,620	2,686,620	2,578,370	4.42

43. The Government of Egypt would ban the use of HCFCs and their blends in the manufacture of XPS foam by 1 January 2023. The Secretariat also noted that HCFC-142b was consumed as a blend (R-406a) in the refrigeration servicing sector, that this consumption has been decreasing, and suggested that addressing this consumption in stage II would enhance the sustainability of the XPS foam conversion. The Government of Egypt agreed to ban the import and use of HCFC-142b and its blends by 1 January 2023.

Domestic AC manufacturing sector

44. The Secretariat understands that the enterprises may wish to wait until the activities in EGYPRA and PRAHA-II are further developed before they make their technology selection. Nonetheless, the Secretariat was unable to assess the incremental cost of the proposal as the incremental costs associated with the conversion will depend on the technology selection.

45. The Secretariat considers that, absent a signal to the market to convert to low-GWP alternatives, it is likely that the market would instead convert to high-GWP alternatives, particularly given that high-GWP alternatives are already present in the market and several of the enterprises already manufacture such equipment. Rather than deferring the domestic AC sector to stage III, and in order to ensure that the momentum from EGYPRA and PRAHA-II was maintained, it was agreed that the Government of Egypt could be invited to submit prior to 1 January 2020, and as part of stage II, a proposal to convert the domestic AC sector to low-GWP alternatives once a technology is selected, thus allowing the incremental costs to be determined. Such an approach would facilitate the submission of the proposal as early as possible, thereby sending a signal to the market to convert to low-GWP technology as early as possible, which could bend the trajectory of market transformation in this sector in favour of low-GWP alternatives.

46. In addition, it was agreed to include US \$250,000 as technical assistance to build on the EGYPRA activities and enable a continued engagement of the manufacturers with the objective of ensuring a conversion to climate friendly alternatives. The technical assistance will include workshops, design analysis and optimization of the initial prototypes, development of terms of references for the selection of a regional testing facility and testing of the optimized prototypes in the facility, and risk assessment. A deduction of 52.08 mt (2.86 ODP tonnes) of HCFC-22 would be associated with his activity.

Commercial AC manufacturing sector

47. The Secretariat noted that no clear technology selection was provided, and that conversion of this sector at this time was not required to ensure Egypt's compliance with the Montreal Protocol control targets. The Secretariat also noted, however, that deferral of this sector would likely result in the conversion of the market to high-GWP alternatives, and that the proposal to integrate IEC with a low-GWP alternative used in a direct expansion refrigerant circuit could be a long-term solution for the large capacity units in the sector. UNIDO also emphasized that the project would not only phase out HCFC consumption in the manufacturing of the equipment, but would also result in a reduction in

consumption of HCFC-22 in the servicing of commercial AC equipment and enhancement of the energy efficiency of such equipment.

48. A primary concern relates to the sustainability of the conversion, particularly given the market already used high-GWP HFCs in package units, central units and chillers, including HFC-134a and R-410A. The Secretariat suggested that a ban on the import and manufacture of high-GWP based commercial AC equipment, or that a set of policies and measures (e.g., government procurement, green labelling, tax or other financial incentives for promoting the low-GWP technology or as a disincentive for high-GWP-based technology) could be implemented to ensure the sustainability of the conversion.

49. Recognizing that it would be difficult to determine a specific date by which the technology would be developed and taken up by the market, it was agreed that the Government would have flexibility during implementation in choosing amongst the measures below, or additional measures that the Government identifies, to ensure the sustainability of the conversion:

- (a) Active promotion of procurement and installation of the new technology, including through government procurement;
- (b) Green labelling to promote adoption of the technology;
- (c) Active promotion of the use of integrated IEC and low-GWP direct expansion technology for specific AC capacity ranges;
- (d) Incentives (tax and other financial incentives) for promoting IEC technology and disincentives to discourage high-GWP based direct expansion technologies for commercial AC applications; and
- (e) A ban on the import and manufacture of high-GWP based commercial AC equipment.

50. On that basis, the level of funding for the sector was agreed at US \$370,000 (US \$6.35/kg) on the understanding that:

- (a) 58.23 mt of HCFC-22 would be deducted from Egypt's remaining consumption eligible for funding;
- (b) The Government, through UNIDO would report on the implementation of the policies and measures identified above, or that it has otherwise identified, through the tranche implementation progress report of stage II of the HPMP until the successful uptake in the market of the alternatives; and
- (c) The equipment would be converted to only low-GWP alternatives for the direct expansion component.

Commercial refrigeration manufacturing sector

51. The Secretariat noted that the sector already imports and manufacturers high-GWP-based equipment, and that such import and manufacturing may be larger than that would be addressed through the conversion of the HCFC-22-based manufacturing, and questioned whether the proposal for conversion to low-GWP alternatives would be sustainable in the absence of a ban on the import and manufacturing of high-GWP-based equipment or other regulatory measures. Given the current status of alternatives and the market, in particular the significant import and manufacturing of high-GWP-based equipment in the country, the Government was not in a position to ban such import and manufacturing. Therefore, and notwithstanding the cost-effectiveness of the proposal, and given that the conversion of the sector at this

time is not required to help ensure Egypt's compliance with the Montreal Protocol control measures, it was agreed to defer this sector.

HC production

52. The Secretariat does not consider the demonstration project for the production and safe use of HC in Nigeria approved as part of its stage I of the HPMP as a precedent for the approval of funding for the HC production facility in Egypt based on the following:

- (a) The request for the HC production facility in Nigeria was submitted as a demonstration project to the 62nd meeting, in response to decision 55/43, inviting bilateral and implementing agencies to submit a limited number of demonstration projects for the conversion of HCFCs in the RAC sector to low-GWP technologies; the call for submitting proposals was later limited by decision 54/39(d) to 2010 as the last year when such projects could be submitted. Decision 72/40 provided a further funding window for demonstration projects introducing low-GWP alternatives, which is now closed. There is currently no decision requesting submission of new demonstration projects; and
- (b) The demonstration project in Nigeria included a phase-out of 10.6 ODP tonnes of HCFC-22 (at US \$4.50/kg) associated with the project.

53. In addition, the Secretariat noted that consideration of such a proposal might be more appropriate once the Government of Egypt and industry have finalised the technology selection for conversion in the AC manufacturing sector. UNDP suggested that the HC production component be deferred to stage III, and that this might be considered in the context of an inter-sectoral approach to enable the supply of affordable, refrigerant-grade HCs, which could be useful in manufacturing or servicing/maintenance, and also noting the nexus with the expected submission of the domestic AC manufacturing sector component.

Refrigeration servicing sector

54. Noting the increase in consumption in the servicing sector, and recalling the limited activities undertaken under stage I, the Secretariat considers a robust set of activities in the servicing sector appropriate. The Secretariat and UNIDO discussed the need and scale of the recovery and reclamation (R&R) programme. While the quantity of refrigerants that will be recovered and reclaimed is not known, it is expected that the quantity will increase annually with the introduction of regulations and the expected increase in price of HCFC-22. In order to proceed in a step-wise fashion and learn from practical experiences on the ground, it was agreed to adjust the proposal to include two R&R centres with testing facilities, 500 service kits, and capacity-building for more than 100 certified service centres and on-site training programme, at a total cost of US \$1,300,200.

55. The total funding for the service sector amounts to US \$2,942,500, with an associated phase-out of 613.02 mt (33.72 ODP tonnes) of HCFC-22 in accordance with decision 74/50.

PMU

56. Based on the adjustments made to the stage II activities, the PMU for UNIDO and UNDP was adjusted to US \$660,000 and US \$150,000. It was agreed that the costs of the PMU might be increased if a domestic AC manufacturing sector proposal is approved as part of stage II.

Agreed costs for stage II of the HPMP

57. The agreed cost of the activities proposed in stage II of the HPMP to achieve 67.5 per cent reduction in 2025 amounts to US \$10,954,863 (excluding agency support costs), with a CE of US \$6.16/kg as summarized in Table 13.

Table 13. Agreed cost for stage II of the HPMP for Egypt

Sector	Agency	Chemical	mt	ODP	Funding (US \$)	CE (US \$/kg)
Domestic AC (technical assistance)	UNIDO	HCFC-22	52.08	2.86	250,000	4.80
Commercial AC (technical assistance)	UNIDO	HCFC-22	58.23	3.20	370,000	6.35
Domestic refrigeration manufacturing	UNIDO	HCFC-141b	372.5	40.98	3,036,641	8.15
PU foam (other than domestic refrigeration manufacturing)	UNDP	HCFC-141b	99.79	10.98	967,352	9.69
XPS		HCFC-22	559	30.75	2,578,370	4.42
		HCFC-142b	24.3	1.58		
Servicing						
Training and certification for HC	Germany	HCFC-22	43.19	2.38	207,300	4.80
Policy, training and certification, standards and awareness campaign	UN Environment	HCFC-22	219.79	12.09	1,055,000	4.80
Reclamation	UNIDO	HCFC-22	270.88	14.90	1,300,200	4.80
Equipment procurement for the servicing sector	UNIDO	HCFC-22	79.17	4.35	380,000	4.80
PMU						
	UNDP				150,000	
	UNIDO				660,000	
Total			1,778.92	124.06	10,954,863	6.16
Additional reductions with no funding*		HCFC-141b	114.43	12.59		
Additional reductions with no funding		HCFC-142b	227.39	14.78		
Total			2,120.75	151.43	10,954,863	5.17

* Includes 8.86 ODP tonnes of consumption beyond the remaining consumption eligible for funding.

Impact on the climate

58. The conversion of the remaining PU and XPS foam manufacturing enterprises in Egypt would avoid the emission into the atmosphere of some 1,480 thousand tonnes of CO₂ equivalent per year, as shown in Table 14.

Table 14. Impact on the climate from the PU and XPS foam projects

Substance	GWP	Tonnes/year	CO ₂ -eq (tonnes/year)
Before conversion			
HCFC-22	1,810	559.0	1,011,790
HCFC-142b	2,310	24.3	56,133
HCFC-141b	725	586.7	425,372
After conversion			
Cyclopentane, HFO-1234ze and MF	~ 20	702.012	14,040
Impact			1,479,255

59. In light of the range of equipment manufactured in the commercial AC manufacturing sector, and that the selection of low-GWP technology has not yet been determined and the energy efficiency enhancements achieved through the use of IEC are not yet quantified, the climate benefits of the conversions in the commercial AC manufacturing sector are estimated based only on the direct emission reductions of HCFC-22 achieved, resulting in the avoidance of some 105 thousand tonnes of CO₂ equivalent per year. Improvements in energy efficiency would result in additional climate benefits.

60. The proposed activities in the servicing sector, which include better containment of refrigerants through training and provision of equipment, will further reduce the amount of HCFC-22 used for refrigeration servicing. Although a calculation of the impact on the climate was not included in the HPMP, the activities planned by the Government of Egypt, in particular its efforts to promote low-GWP alternatives, refrigerant R&R, indicate that the implementation of the HPMP will reduce the emission of refrigerants into the atmosphere therefore resulting in benefits on the climate.

Co-financing

61. Based on the project as submitted, the cost of the foam sector was estimated at US \$4,555,100, of which US \$4,003,993 was requested from the Multilateral Fund, with the difference of US \$551,107 provided by the enterprises.

2017-2019 draft business plan of the Multilateral Fund

62. UNIDO, UNDP, UN Environment, and the Government of Germany are requesting US \$10,954,863 plus agency support costs for the implementation of stage II of the HPMP. The total value requested of US \$10,137,024 for the period 2017 to 2019, is US \$4,227,209 below the amount in the business plan between 2017 and 2019.

Draft Agreement

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

RECOMMENDATION

64. The Executive Committee may wish to consider:

- (a) Approving, in principle, stage II of the HCFC phase-out management plan (HPMP) for Egypt for the period from 2017 to 2025 to reduce HCFC consumption by 67.5 per cent of its baseline, at the amount of US \$11,786,341 consisting of US \$5,996,841, plus agency support costs of US \$419,779 for UNIDO; US \$3,695,722, plus agency support costs of US \$258,701 for UNDP; US \$1,055,000, plus agency support costs of US \$126,050 for UN Environment; and US \$207,300, plus agency support costs of US \$26,949 for the Government of Germany;
- (b) Noting that the Government of Egypt has also committed to reducing HCFC consumption by 35 per cent by 2020;

- (c) Noting the commitment of the Government of Egypt to:
 - (i) Ban the import of HCFC-141b contained in imported pre-blended polyols by 1 January 2018 pursuant to decision 65/38;
 - (ii) Ban the import, use and export of HCFC-141b in bulk and export of HCFC-141b contained in pre-blended polyols by 1 January 2020;
 - (iii) Ban the use of HCFCs and blends of HCFCs in the manufacture of extruded polystyrene foam by 1 January 2023; and
 - (iv) Ban the import of HCFC-142b and blends of HCFC-142b by 1 January 2023;
- (d) To invite the Government of Egypt to submit, once a technology is selected and prior to 1 January 2020, as part of stage II, a proposal to convert the domestic air-conditioning sector to low-global warming potential alternatives;
- (e) To note that the Government of Egypt would have flexibility to allocate funding to the eligible enterprises in the polyurethane foam sector for which funding was not requested, if deemed necessary during implementation;
- (f) Deducting 146.97 ODP tonnes of HCFCs from the remaining HCFC consumption eligible for funding, including 4.4 ODP tonnes pursuant to decision 76/40;
- (g) Approving the draft Agreement between the Government of Egypt and the Executive Committee for the reduction in consumption of HCFCs, in accordance with stage II of the HPMP, contained in Annex I to the present document; and
- (h) Approving the first tranche of stage II of the HPMP for Egypt, and the corresponding tranche implementation plans, in the amount of US \$5,498,394, consisting of US \$3,921,047, plus agency support costs of US \$274,473 for UNIDO, US \$945,617, plus agency support costs of US \$66,193 for UNDP, and US \$260,000, plus agency support costs of US \$31,064 for UN Environment.

Annex I

DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF EGYPT AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN

Purpose

1. This Agreement represents the understanding of the Government of Egypt (the “Country”) and the Executive Committee with respect to the reduction of controlled use of the ozone depleting substances (ODS) set out in Appendix 1-A (“The Substances”) to a sustained level of 125.54 ODP tonnes by 1 January 2025 in compliance with Montreal Protocol schedule.
2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A (“The Targets, and Funding”) in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3, 4.2.3, 4.3.3, 4.4.3 and 4.5.3 (remaining consumption eligible for funding).
3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A (“Funding Approval Schedule”).
4. The Country agrees to implement this Agreement in accordance with the stage II of the HCFC phase-out management plan (HPMP) approved (“the Plan”). In accordance with sub-paragraph 5(b) of this Agreement, the Country will accept independent verification of the achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement. The aforementioned verification will be commissioned by the relevant bilateral or implementing agency.

Conditions for funding release

5. The Executive Committee will only provide the Funding in accordance with the Funding Approval Schedule when the Country satisfies the following conditions at least eight weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:
 - (a) That the Country has met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved. Years for which there are no due country programme implementation reports at the date of the Executive Committee meeting at which the funding request is being presented are exempted;
 - (b) That the meeting of these Targets has been independently verified for all relevant years, unless the Executive Committee decided that such verification would not be required;

- (c) That the Country had submitted a Tranche Implementation Report in the form of Appendix 4-A (“Format of Tranche Implementation Reports and Plans”) covering each previous calendar year; that it had achieved a significant level of implementation of activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and
- (d) That the Country has submitted a Tranche Implementation Plan in the form of Appendix 4-A covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

Monitoring

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A (“Monitoring Institutions and Roles”) will monitor and report on implementation of the activities in the previous Tranche Implementation Plans in accordance with their roles and responsibilities set out in the same appendix.

Flexibility in the reallocation of funds

7. The Executive Committee agrees that the Country may have the flexibility to reallocate part or all of the approved funds, according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

- (a) Reallocations categorized as major changes must be documented in advance either in a Tranche Implementation Plan as foreseen in sub-paragraph 5(d) above, or as a revision to an existing Tranche Implementation Plan to be submitted eight weeks prior to any meeting of the Executive Committee, for its approval. Major changes would relate to:
 - (i) Issues potentially concerning the rules and policies of the Multilateral Fund;
 - (ii) Changes which would modify any clause of this Agreement;
 - (iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches;
 - (iv) Provision of funding for activities not included in the current endorsed Tranche Implementation Plan, or removal of an activity in the Tranche Implementation Plan, with a cost greater than 30 per cent of the total cost of the last approved tranche; and
 - (v) Changes in alternative technologies, on the understanding that any submission for such a request would identify the associated incremental costs, the potential impact to the climate, and any differences in ODP tonnes to be phased out if applicable, as well as confirm that the Country agrees that potential savings related to the change of technology would decrease the overall funding level under this Agreement accordingly;
- (b) Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the subsequent Tranche Implementation Report;

- (c) Any enterprise to be converted to non-HCFC technology included in the Plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e., due to foreign ownership or establishment post the 21 September 2007 cut-off date), would not receive financial assistance. This information would be reported as part of the Tranche Implementation Plan;
- (d) The Country agrees, in cases where HFC technologies have been chosen as an alternative to HCFCs, and taking into account national circumstances related to health and safety: to monitor the availability of substitutes and alternatives that further minimize impacts on the climate; to consider, in the review of regulations standards and incentives adequate provisions that encourage introduction of such alternatives; and to consider the potential for adoption of cost-effective alternatives that minimize the climate impact in the implementation of the HPMP, as appropriate, and inform the Executive Committee on the progress accordingly in tranche implementation reports; and
- (e) Any remaining funds held by the bilateral or implementing agencies or the Country under the Plan will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

Considerations for the refrigeration servicing sector

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sector included in the Plan, in particular:

- (a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and
- (b) The Country and relevant bilateral and/or implementing agencies would take into consideration relevant decisions on the refrigeration servicing sector during the implementation of the Plan.

Bilateral and implementing agencies

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNIDO has agreed to be the lead implementing agency (the "Lead IA") and UNDP, United Nations Environment Programme (UN Environment) and the Government of Germany have agreed to be the cooperating implementing agencies (the "Cooperating IAs") under the lead of the Lead IA in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of the Lead IA and Cooperating IAs taking part in this Agreement.

10. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification as per sub-paragraph 5(b). The Cooperating IAs will support the Lead IA by implementing the Plan under the overall co-ordination of the Lead IA. The roles of the Lead IA and Cooperating IAs are contained in Appendix 6-A and Appendix 6-B, respectively. The Executive Committee agrees, in principle, to provide the Lead IA and the Cooperating IAs with the fees set out in rows 2.2, 2.4, 2.6 and 2.8 of Appendix 2-A.

Non-compliance with the Agreement

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A (“Reductions in Funding for Failure to Comply”) in respect of each ODP kg of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once decisions are taken, the specific case of non-compliance with this Agreement will not be an impediment for the provision of funding for future tranches as per paragraph 5 above.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decisions that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee, and the Lead IA and the Cooperating IAs to facilitate implementation of this Agreement. In particular, it will provide the Lead IA and the Cooperating IAs with access to the information necessary to verify compliance with this Agreement.

Date of completion

14. The completion of the Plan and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified in Appendix 2-A. Should at that time there still be activities that are outstanding, and which were foreseen in the last Tranche Implementation Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion of the Plan will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), 1(b), 1(d), and 1(e) of Appendix 4-A will continue until the time of the completion of the Plan unless otherwise specified by the Executive Committee.

Validity

15. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

16. This Agreement may be modified or terminated only by mutual written agreement of the Country and the Executive Committee of the Multilateral Fund.

APPENDICES

APPENDIX 1-A: THE SUBSTANCES

Substance	Annex	Group	Starting point for aggregate reductions in consumption (ODP tonnes)
HCFC-22	C	I	240.19
HCFC-123	C	I	0.11
HCFC-141b	C	I	129.61
HCFC-142b	C	I	16.36
Sub-total			386.27
HCFC-141b contained in imported pre-blended polyols	C	I	98.34
Total	C	I	484.61

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	347.64	347.64	347.64	251.08	251.08	251.08	251.08	251.08	125.54	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	347.64	289.70	289.70	251.08	251.08	251.08	251.08	251.08	125.54*	n/a
2.1	Lead IA (UNIDO) agreed funding (US \$)	3,921,047	0	1,073,714	0	391,827	0	391,827	0	218,426	5,996,841
2.2	Support costs for Lead IA (UNIDO) (US \$)	274,473	0	75,160	0	27,428	0	27,428	0	15,290	419,779
2.3	Cooperating IA (UNDP) agreed funding (US \$)	945,617	0	2,750,105	0	0	0	0	0	0	3,695,722
2.4	Support costs for Cooperating IA (UNDP) (US \$)	66,193	0	192,507	0	0	0	0	0	0	258,701
2.5	Cooperating IA (UN Environment) agreed funding (US \$)	260,000	0	279,500	0	260,000	0	150,000	0	105,500	1,055,000
2.6	Support costs for Cooperating IA (UN Environment) (US \$)	31,064	0	33,394	0	31,064	0	17,922	0	12,605	126,050
2.7	Cooperating IA (Germany) agreed funding (US \$)	0	0	207,300	0	0	0	0	0	0	207,300
2.8	Support costs for Cooperating IA (Germany) (US \$)	0	0	26,949	0	0	0	0	0	0	26,949
3.1	Total agreed funding (US \$)	5,126,664	0	4,310,619	0	651,827	0	541,827	0	323,926	10,954,863
3.2	Total support costs (US \$)	371,730	0	328,010	0	58,492	0	45,350	0	27,895	831,478
3.3	Total agreed costs (US \$)	5,498,394	0	4,638,630	0	710,319	0	587,177	0	351,821	11,786,341

4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)	70.53
4.1.2	Phase-out of HCFC-22 to be achieved in the previous stage (ODP tonnes)	6.13
4.1.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)	163.53
4.2.1	Total phase-out of HCFC-123 agreed to be achieved under this Agreement (ODP tonnes)	0
4.2.2	Phase-out of HCFC-123 to be achieved in the previous stage (ODP tonnes)	0
4.2.3	Remaining eligible consumption for HCFC-123 (ODP tonnes)	0.11
4.3.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)	33.92**
4.3.2	Phase-out of HCFC-141b to be achieved in the previous stage (ODP tonnes)	95.69
4.3.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)	0
4.4.1	Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes)	16.36
4.4.2	Phase-out of HCFC-142b to be achieved in the previous stage (ODP tonnes)	0
4.4.3	Remaining eligible consumption for HCFC-142b (ODP tonnes)	0
4.5.1	Total phase-out of HCFC-141b in imported pre-blended polyols agreed to be achieved under this Agreement (ODP tonnes)	26.16
4.5.2	Phase-out of HCFC-141b in imported pre-blended polyols to be achieved in the previous stage (ODP tonnes)	72.18
4.5.3	Remaining eligible consumption for HCFC-141b in imported pre-blended polyols(ODP tonnes)	0

* Maximum allowable total consumption of Annex C, Group I substances would be further reduced by no more than 10 ODP tonnes upon approval of a domestic air-conditioning sector plan as part of stage II

** Including the phase-out of 4.4 ODP tonnes approved at the 76th meeting and herewith subsumed into this Agreement.

Note: Date of completion of stage I as per stage I Agreement: 31 December 2019.

APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the First meeting of the year specified in Appendix 2-A.

APPENDIX 4-A: FORMAT OF TRANCHE IMPLEMENTATION REPORTS AND PLANS

1. The submission of the Tranche Implementation Report and Plans for each tranche request will consist of five parts:

- (a) A narrative report, with data provided by tranche, describing the progress achieved since the previous report, reflecting the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it, and how they relate to each other. The report should include the amount of ODS phased out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives, to allow the Secretariat to provide to the Executive Committee information about the resulting change in climate relevant emissions. The report should further highlight successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted Tranche Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes;
- (b) An independent verification report of the Plan results and the consumption of the Substances, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

- (c) A written description of the activities to be undertaken during the period covered by the requested tranche, highlighting implementation milestones, the time of completion and the interdependence of the activities, and taking into account experiences made and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall Plan and progress achieved, as well as any possible changes to the overall Plan that are foreseen. The description should also specify and explain in detail such changes to the overall plan. This description of future activities can be submitted as a part of the same document as the narrative report under sub-paragraph (b) above;
 - (d) A set of quantitative information for all Tranche Implementation Reports and Plans, submitted through an online database; and
 - (e) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(d).
2. In the event that in a particular year two stages of the HPMP are being implemented in parallel, the following considerations should be taken in preparing the Tranche Implementation Reports and Plans:
- (a) The Tranche Implementation Reports and Plans referred to as part of this Agreement, will exclusively refer to activities and funds covered by this Agreement; and
 - (b) If the stages under implementation have different HCFC consumption targets under Appendix 2-A of each Agreement in a particular year, the lower HCFC consumption target will be used as reference for compliance with these Agreements and will be the basis for the independent verification.

APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES

1. The National Ozone Unit (NOU) is an integral part of the Ministry of State for Environmental Affairs under the direct responsibility of the Egyptian Environmental Affairs Agency (EEAA). The NOU will continue to have general responsibility for the implementation of the ODS programmes, including the HPMP. Under the direct supervision of the NOU, a Project Management Unit will be established within the NOU.
2. The monitoring process will be managed by the NOU in close cooperation with relevant authorities with the assistance of the Lead IA and the Cooperating IAs.
3. The consumption will be monitored and determined based on official import and export data for the Substances recorded by relevant Government departments. The NOU shall compile and report on an annual basis on or before the relevant due dates on consumption of the Substances to be submitted to the Ozone Secretariat and on progress of implementation of HPMP to be submitted to the Executive Committee.
4. The NOU and the Lead IA will engage an independent and qualified entity to carry out a qualitative and quantitative performance evaluation of the HPMP implementation.
5. The evaluating entity shall have full access to relevant technical and financial information related to implementation of the HPMP; it shall prepare and submit to the NOU and the Lead IA, a consolidated draft report at the end of each Tranche Implementation Plan, comprising of the findings of the evaluation and recommendations for improvements or adjustments, if any. The draft report shall include the status of

the Country's compliance with the provisions of this Agreement upon incorporating the comments and explanations as may be applicable, from NOU, Lead IA and the Cooperating IAs, the evaluating entity shall finalize the report and submit to the NOU and Lead IA.

6. The NOU shall endorse the final report and the Lead IA shall submit the same to the relevant meeting of the Executive Committee along with the Tranche Implementation plan and reports.

APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY

1. The Lead IA will be responsible for a range of activities, including at least the following:
 - (a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;
 - (b) Assisting the Country in preparation of the Tranche Implementation Reports and Plans as per Appendix 4-A;
 - (c) Providing independent verification to the Executive Committee that the Targets have been met and associated tranche activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;
 - (d) Ensuring that the experiences and progress is reflected in updates of the overall plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;
 - (e) Fulfilling the reporting requirements for the Tranche Implementation Reports and Plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee, and should include the activities implemented by the Cooperating IAs;
 - (f) In the event that the last funding tranche is requested one or more years prior to the last year for which a consumption target had been established, annual tranche implementation reports and, where applicable, verification reports on the current stage of the Plan should be submitted until all activities foreseen had been completed and HCFC consumption targets had been met;
 - (g) Ensuring that appropriate independent technical experts carry out the technical reviews;
 - (h) Carrying out required supervision missions;
 - (i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;
 - (j) Co-ordinating the activities of the Cooperating IAs, and ensuring appropriate sequence of activities;
 - (k) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country and the Cooperating IAs, the allocation of the reductions to the different budget items and to the funding of the Lead IA and each Cooperating IA;
 - (l) Ensuring that disbursements made to the Country are based on the use of the indicators;

- (m) Providing assistance with policy, management and technical support when required;
- (n) Reaching consensus with the Cooperating IAs on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan; and
- (o) Timely releasing funds to the Country/participating enterprises for completing the activities related to the project.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

APPENDIX 6-B: ROLE OF THE COOPERATING IMPLEMENTING AGENCIES

1. The Cooperating IAs will be responsible for a range of activities. These activities are specified in the Plan, including at least the following:

- (a) Providing assistance for policy development when required;
- (b) Assisting the Country in the implementation and assessment of the activities funded by the Cooperating IAs, and refer to the Lead IA to ensure a co-ordinated sequence in the activities;
- (c) Providing reports to the Lead IA on these activities, for inclusion in the consolidated reports as per Appendix 4-A; and
- (d) Reaching consensus with the Lead IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan.

APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US \$144 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met, on the understanding that the maximum funding reduction would not exceed the funding level of the tranche being requested. Additional measures might be considered in cases where non-compliance extends for two consecutive years.

2. In the event that the penalty needs to be applied for a year in which there are two Agreements in force (two stages of the HPMP being implemented in parallel) with different penalty levels, the application of the penalty will be determined on a case-by-case basis taking into consideration the specific sectors that lead to the non-compliance. If it is not possible to determine a sector, or both stages are addressing the same sector, the penalty level to be applied would be the largest.