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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Eighty-second Meeting
Montreal, 3-7 December 2018

PROJECT PROPOSALS: EGYPT

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

Foam

- Conversion project for replacement of HFC-134a with HCO/HFO blend for producing discontinuous panels in Army Factory UNDP

Phase-out

- HCFC phase-out management plan (stage I, third tranche) UNIDO and UNDP

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT

EGYPT

PROJECT TITLE(S)

BILATERAL/IMPLEMENTING AGENCY

(a) Conversion project for replacement of HFC-134a with HCO/HFO blend for producing discontinuous panels in Army Factory	UNDP
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NATIONAL CO-ORDINATING AGENCY	Egyptian Environmental Affair Agency (EEAA)
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LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (METRIC TONNES, 2017, AS OF MAY 2018)

Annex F, Group I	mt	n/a
	mt CO ₂ -eq.	n/a

B: COUNTRY PROGRAMME SECTORAL DATA (METRIC TONNES, 2017, AS OF MAY 2018)

Annex F, Group I	mt	n/a
	mt CO ₂ -eq.	n/a

HFC consumption remaining eligible for funding	mt	n/a
	mt CO ₂ -eq.	n/a

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US \$	Phase-out ODP tonnes
	(a)	n/a	n/a

PROJECT TITLE:	Army Factory	
HFC-134a used at enterprise:	mt	55.5
	mt CO ₂ -eq.	79,365
HFC-134a to be phased out through this project:	mt	55.5
	mt CO ₂ -eq.	79,365
HCO/HFO to be phased in:	mt	55.5
	mt CO ₂ -eq.	117
Project duration (months):		24
Initial amount requested (US \$):		398,900
Final project costs (US \$):		
Incremental capital cost:		
Contingency (10%):		
Incremental operating cost:		
Total project cost:		
Local ownership (%):		100
Export component (%):		0
Requested grant (US \$):*		398,900
Cost-effectiveness*:	US \$/kg	7.19
	US \$/mt CO ₂ -eq.	5.02
Implementing agency support cost (US \$):*		27,923
Total cost of project to Multilateral Fund (US \$):*		426,823
Status of counterpart funding (Y/N):		N
Project monitoring milestones included (Y/N):		Y
SECRETARIAT'S RECOMMENDATION	For individual consideration	

* As submitted.

NOTE FROM THE SECRETARIAT

Background

Consideration of the project for Army factory at the 81st meeting

1. On behalf of the Government of Egypt, UNDP submitted to the 81st meeting a project proposal for the phase-out of HFCs for conversion of the manufacturing of discontinuous panels at Army Factory from HFC-134a to HFO based alternatives in line with decision 78/3(g).¹ The total cost of the project was estimated at US \$1,007,400, plus agency support costs of US \$70,518.
2. Further to discussions with UNDP on technical and cost aspects of the proposals, the Secretariat noted that the project had limited replicability at the country/regional level as well as sectoral level, and the technology proposed using HFOs was not mature and proven. The Secretariat also noted that the costs request were higher than those in other projects approved using reduced HFO-based formulations for discontinuous panels, and proposed a total cost of US \$224,694.
3. At the 81st meeting, the Executive Committee considered the proposal, but did not approve it owing to concerns raised during the discussion in the contact group established for the discussion of HFC investment projects, particularly relating to replicability, and technology maturity for conversion using HFO-based formulations.
4. As a result of the discussions, the Executive Committee decided that those HFC investment projects about which concerns had been expressed at the 81st meeting could be resubmitted in accordance with decision 79/45² only if those specific concerns had been addressed (decision 81/53(c)).

Re-submission of the project for Army Factory for consideration at the 82nd meeting

5. On behalf of the Government of Egypt, UNDP has re-submitted to the 82nd meeting the project for conversion of the manufacturing of discontinuous panels at Army Factory from HFC-134a to hydrochloroolefins (HCO)/HFO, at a reduced amount of US \$398,900, plus agency support costs of US \$27,923.
6. The following sections³ comprise additional information submitted to the 82nd meeting, the Secretariat's comments including the discussion on whether the issues raised at the 81st meeting have been addressed and a recommendation. Document UNEP/OzL.Pro/ExCom/81/33 is attached to this document for ease of reference.

Additional information since the 81st meeting

7. UNDP provided the following additional information:
 - (a) The total consumption of HFC-134a in the enterprise was 55.5 mt (79,365 tonnes CO₂-eq.) in 2017;
 - (b) The technology for conversion has been replaced from HFOs to hydrochloroolefin (HCO)/HFOs, noting that operating with HFO alone would be financially unsustainable;

¹ At the 80th meeting, the amount of US \$30,000, plus agency support costs of US \$2,100, was approved for the preparation of this project.

² Decision 79/45 states that all submitted HFC investment projects should have broad replicability within the country, region or sector, and should take into account geographic distribution.#

³ Information was extracted from document UNEP/OzL.Pro/ExCom/81/33 where relevant.

- (c) With regard to the replicability in the country and region, and maturity of technology:
- (i) The use of HFC-134a as blowing agent in discontinuous panels, should also extend to all HFCs including HFC-245fa and HFC-365mfc, which are commonly used as blowing agents;
 - (ii) The proposed alternative technology should be considered mature and available based on the outcomes of recently completed laboratory study in Mexico on the use of HCO/HFO pre-blended in the polyol systems, and that two systems houses in Egypt are already working on this technology while two other systems houses are considering the use of this technology; given the technical complexity in formulating polyol systems based on these blends, polyol blends need to be procured from a systems house; and
 - (iii) The project is to be implemented with the support from the project manager of the HCO/HFO project in Mexico; two systems houses (Dow Chemicals and Foam Supplies International (FSI)), would provide support for systems development without any financial compensation; however, no written confirmation from these intended partners were provided to support this proposal.

8. The incremental capital costs (ICC) for the project, as submitted, included compensation for the project manager from Mexico (US \$30,000) and trials for four sets of blowing-agent systems (US \$40,000). Incremental operating costs (IOC) based on a formulation using 10 per cent of HCO/HFO blend as a blowing agent was estimated at US \$321,900. Table 1 presents the costs of conversion.

Table 1. Costs for conversion of discontinuous panel manufacturing in Egypt

Particulars	Submission at the 81 st meeting (US \$)	Secretariat's proposal at the 81 st meeting (US \$)	Revised submission at the 82 nd meeting (US \$)
Technology option	HFO	HFO/Water	HCO/HFO
High pressure dispenser	130,000		
Spare mixing head	20,000		
Technical support	50,000	15,000	30,000
Trials	40,000	15,000	40,000
Safety Audit	10,000		
International seminar and project completion report	20,000		
Sub-total	270,000	30,000	70,000
Contingencies	27,000		7,000
ICC	297,000	30,000	77,000
IOC	710,400	195,000	321,900
Grand total	1,007,400	225,000	398,900
Cost-effectiveness (US \$/kg)	18.15	4.05	7.19

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

9. The Secretariat reviewed the proposal in light of decisions 78/3(g) and 81/53, and the project submitted to the 81st meeting; noting that the main issues identified during the review process were replicability and technology maturity.

Replicability

10. The Secretariat reiterated that in line with decision 78/3(g), the alternative technology selected should demonstrate replicability to replace the current blowing agent (i.e., HFC-134a) being used in the enterprise and not other HFCs (e.g., HFC-245fa, HFC-365mfc); there is very little consumption of HFC-134a in Egypt and in other Article 5 countries for the use in discontinuous panels. Upon request for information on replicability of use of HFC-134a as a blowing agent in discontinuous panels, UNDP indicated that an ongoing survey in the country might result in new information; at present, they can confirm that only the beneficiary enterprise is using HFC-134a as blowing agent in the country. As indicated in paragraph 17 of document UNEP/OzL.Pro/ExCom/81/33, replicability potential of this project is limited. The additional information as indicated in paragraph 7(c)(i) provided by UNDP to the 82nd meeting does not satisfactorily demonstrate replicability for this project.

Technology maturity

11. The Secretariat noted that the alternative being proposed (HCO/HFO) is based on the results of a demonstration project implemented in Mexico with support outside the Multilateral Fund. The alternative used was developed on a “laboratory scale” and commercial availability of the systems is not confirmed. Upon request for clarifications, UNDP mentioned that partnership with two system houses in Egypt, which are the suppliers, should serve as confirmation that the technology availability. UNDP also mentioned that both HCOs and HFOs were previously introduced and price offers were obtained from local system houses confirming their availability in the market in Egypt. The Secretariat noted that the commercial availability of the HCO/HFO systems in Egypt market was not demonstrated and that additional efforts are needed to make these systems commercially available to be used by the beneficiary.

12. The Secretariat further noted the limited progress in implementing the conversions of the systems houses and downstream users participating in the stage I of the HCFC phase-out management plan for Egypt; noting the remaining activities that must be undertaken under stage I, and recalling that stage I will be completed by 31 December 2018, the Secretariat was concerned that implementation of the proposed HFC phase-out project could delay the implementation of the HPMP which was one of the pre-conditions set-out in decision 81/53.

13. Based on the information provided in the resubmitted proposal and discussions with UNDP, the Secretariat concluded that the replicability of the project proposal has not been demonstrated and that technology maturity is limited in the local market.

14. Since the conditions of decision 81/53 were not met, and the concerns expressed at the 81st meeting about this project were not addressed in the resubmitted proposal, the Secretariat did not discuss the revised costs with UNDP. Where relevant, the Secretariat maintains its views on the eligible incremental cost calculations for the project as indicated in paragraphs 24 and 30 of the proposal submitted to the 81st meeting.

RECOMMENDATION

15. The Executive Committee may wish to consider:

- (a) The project proposal for the conversion from HFC-134a to HFO in the manufacture of discontinuous panels in Army Factory, Egypt, in the context of its discussion on HFC stand-alone project submitted to the 82nd meeting in line with decision 78/3(g), as described in the document on the Overview of issues identified during project review (UNEP/OzL.Pro/ExCom/82/31); and

- (b) Whether or not to approve the project proposal indicated in sub-paragraph (a) above in the amount of US \$224,694, plus agency support costs of US \$20,222 for UNDP, on the understanding, if the project were to be approved:
- (i) That no further funding would be available until the instrument of ratification by the Government of Egypt had been received by the depositary at the Headquarters of the United Nations in New York;
 - (ii) That 55.5 metric tonnes (mt) (79,365 mt CO₂-eq) of HFC-134a would be deducted from the starting point for sustained aggregate reduction in HFC once it had been established;
 - (iii) That the project would be completed within 24 months of the transfer of funds to UNDP, and a comprehensive completion report would be submitted within six months of project completion with detailed information on:
 - a. The eligible incremental capital costs for all equipment and other components including those not funded under the project;
 - b. Incremental operating costs;
 - c. Any possible savings incurred during the conversion and relevant factors that facilitated implementation (e.g. whether any purchased and/or installed equipment or supplies had gone through a competitive quote/bidding process and the details thereof); and
 - (iv) That any remaining funds would be returned to the Multilateral Fund no later than one year after the date of project completion.

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Egypt

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase out plan (Stage I)	UNIDO (lead), UNEP	65 th	25% by 2018

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2017	346.46 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2017	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-22		29.5		98.4	118.1				246.0
HCFC-141b		95.8							95.8
HCFC-142b		1.9			2.7				4.6
HCFC-141b in imported pre-blended polyol		9.7							9.7

(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		2018	
UNDP	ODS phase-out (ODP tonnes)		13.86
	Funding (US \$)		770,130
UNIDO	ODS phase-out (ODP tonnes)		4.5
	Funding (US \$)		250,018

(VI) PROJECT DATA			2010*	2011	2012	2013	2014	2015	2018	Total
Montreal Protocol consumption limits			n/a	n/a	n/a	386.27	386.27	347.64	347.64	n/a
Maximum allowable consumption (ODP tonnes)			n/a	n/a	n/a	386.27	386.27	347.64	289.70	n/a
Agreed Funding (US \$)	UNIDO	Project costs	892,840	950,000	250,000	0	0	0	232,575	2,325,415
		Support costs	66,963	71,250	18,750	0	0	0	17,443	174,406
	UNDP	Project costs	1,479,000	2,000,000	2,000,000	0	0	0	716,400	6,195,400
		Support costs	115,463	150,000	150,000	0	0	0	53,730	469,193
Funds approved by ExCom (US \$)	Project costs		2,371,840	2,950,000	2,250,000	0	0	0	0	7,571,840
	Support costs		182,426	221,250	168,750	0	0	0	0	572,426
Total funds requested for approval at this meeting (US \$)	Project costs								948,975	948,975
	Support costs								71,173	71,173

* Approved at the 62nd meeting and herewith subsumed into this Agreement.

Secretariat's recommendation:	For individual consideration
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PROJECT DESCRIPTION

16. On behalf of the Government of Egypt, UNIDO as the lead implementing agency, has submitted a request for funding for the third and final tranche of stage I of the HCFC phase-out management plan (HPMP), at a total cost of US \$1,020,148, consisting of US \$232,575, plus agency support costs of US \$17,443 for UNIDO, and US \$716,400, plus agency support costs of US \$53,730 for UNDP.⁴ The submission includes a progress report on the implementation of the second tranche, the verification report on HCFC consumption for 2016 to 2017 and the tranche implementation plan for 2018 to 2019.

Report on HCFC consumption

17. The Government of Egypt reported a consumption of 346.46 ODP tonnes of HCFC in 2017, which is 10 per cent below the HCFC baseline for compliance. The 2013-2017 HCFC consumption is shown in Table 1.

Table 1. HCFC consumption in Egypt (2013-2017 Article 7 data)

HCFC	2013	2014	2015	2016	2017	Baseline
Metric tonnes						
HCFC-22	3,416.49	3,172.59	4,038.97	4,767.59	4,472.52	4,367.16
HCFC-123	24.48	0	9.07	5.00	1.64	5.25
HCFC-124	1.68	0.27	2.70	0.00	2.09	0
HCFC-141b	906.34*	1,238.78*	1,072.75	731.53	871.01	1,178.26
HCFC-142b	136.45	146.49	42.04	57.53	70.54	251.69
Sub-total (mt)	4,485.44	4,558.13	5,165.53	5,561.65	5,417.80	5,802.36
HCFC-141b in imported pre-blended polyols**	155.61	120.00	100.00	177.80	87.95	894.00***
Total (mt)	4,641.05	4,678.13	5,265.53	5,739.45	5,505.75	6,696.76
ODP tonnes						
HCFC-22	187.91	174.49	222.14	262.22	245.99	240.19
HCFC-123	0.49	0	0.18	0.10	0.03	0.11
HCFC-124	0.04	0.01	0.06	0.00	0.05	0.00
HCFC-141b	99.70*	136.27*	118.00	80.47	95.81	129.61
HCFC-142b	8.87	9.52	2.73	3.74	4.59	16.36
Sub-total (ODP tonnes)	297.01	320.29	343.12	346.53	346.46	386.27
HCFC-141b in imported pre-blended polyols**	17.12	13.20	11.00	19.56	9.67	98.34***
Total (ODP tonnes)	314.13	333.49	354.12	366.09	356.14	484.61

*Import of HCFC-141b contained in pre-blended polyols was reported as consumption under Article 7 in 2013 and 2014. The national ozone unit (NOU) will request the correction.

** Country programme data.

***Average 2007-2009 consumption.

18. The use of HCFC-22 is mainly for servicing of refrigeration and air-conditioning (RAC) equipment, the increase in the period of 2015 to 2017 is due to market recovery after the unrest in the country in 2013 and 2014. The import of HCFC-141b (pure and pre-blended in polyols) and HCFC-142b is for the use in the foam sector. The fluctuations in the consumption of HCFC-142b is market-driven. The decrease in HCFC-141b consumption is due to the phase-out activities in the foam sector. The decrease in the consumption of HCFC-141b in imported pre-blended polyol in 2017 is likely due to the announcement of its ban from 1 January 2018. There is an import of small quantities of HCFC-123 and HCFC-124 for specialized refrigeration.

⁴ As per the letter of 19 September 2018 from the Ministry of Environment of Egypt to UNIDO.

Country programme (CP) implementation report

19. The Government of Egypt reported HCFC sector consumption data under the 2017 CP implementation report which is consistent with the data reported under Article 7 of the Montreal Protocol.

Verification report

20. The verification report confirmed that the Government is implementing a licensing and quota systems for HCFC import and export, and that the total consumption of HCFCs in 2016 and 2017 was 346.53 and 346.46 ODP tonnes respectively. The verification concluded that the existing licensing systems is effectively implemented by the National Ozone Unit (NOU) under the supervision of the National Ozone Committee, consisting of representatives of all concerned ministries, enforcement authorities, Chamber of Trade, Federation of Egyptian Industries, Custom Protection Agencies and non-governmental organizations.

Progress report on the implementation of the second tranche of the HPMP*Legal framework*

21. The HCFCs licensing and quota system (except for HCFC-141b in imported pre-blended polyols) came into force in 2013. The Government has banned the import of HCFC-141b in pre-blended polyols as of 1 January 2018. The ban is implemented through the cooperation between the Egyptian Environmental Affairs Agency (EEAA) and Customs Authority whereby the customs authority checks all imports under the general Harmonized System code for polyols with the assistance of the NOU.

Manufacturing sector

22. All nine foam manufacturing enterprises included in stage I⁵ completed conversion with the total phase-out of 92.1 ODP tonnes of HCFC-141b. One enterprise (Cairo Foam) converted to methyl formate (MF) instead of cyclopentane as planned, while the remaining enterprises chose the initially agreed technology. Details on the enterprises conversion are presented in Table 2. The balance of US \$44,654 (consisting of US \$2,178 for Fresh Electric Home Appliances and US \$42,476 for MOG Engineering and Industry, plus agency support costs) will be returned to the 82nd meeting.

Table 2. Details on completed foam enterprises conversion

No.	Enterprise	Sub-sector/ application	HCFC-141b phased out (ODP tonnes)	Alternative technology	Funding approved (US \$)	Funding disbursed (US \$)	Agency
1	Mondial Freezers Company	Refrigeration (insulation foam)	6.6	Cyclopentane	436,300	436,080*	UNIDO
2	El-Araby Co. for Engineering Industries	Refrigeration (insulation foam)	11	Cyclopentane	456,540	456,534*	UNIDO
3	Kiriazzi Refrigerators Factory	Refrigeration (insulation foam)	13.6	Cyclopentane	564,575	564,575	UNIDO
4	Specialized Engineering Contracting Co.	Spray foam	11.2	MF	178,000	178,000	UNDP

⁵ Including six enterprises (funding for which was approved at the 62nd meeting) incorporated in stage I at the 65th meeting. The HCFC-141b phase-out project at Delta Electric Appliances, at a total cost of US \$422,740 plus agency support costs was approved at the 62nd meeting; following the purchase of an enterprise by non-article 5 entity the project has been cancelled and the approved funding has been returned to the Fund at the 70th meeting.

No.	Enterprise	Sub-sector/ application	HCFC-141b phased out (ODP tonnes)	Alternative technology	Funding approved (US \$)	Funding disbursed (US \$)	Agency
5	MOG Engineering and Industry	Panels	13.9	n-pentane	790,400	747,924	UNDP
6	Fresh Electric Home Appliances	Water heaters (insulation foam)	2.4	MF	124,500	122,322	UNDP
7	Cairo Foam	Panels	9.9	MF	386,100	379,877	UNDP
8	Refrtruck	Trucks, panels	11.7	Cyclopentane	569,500	559,500	UNDP
9	Al Fateh for Engineering and General Contracting	Sandwich panels	11.8	Cyclopentane	346,300	336,300	UNDP
All enterprises			92.1	n/a	3,852,215	3,781,327	n/a

* The balance of US \$226 was returned by UNIDO to the 79th meeting.

23. The project to convert 81 small and medium enterprises (SMEs) and 350 micro users to MF or other low-global warming potential (GWP) technology (to be selected during implementation) with the support from their systems houses and distributors is expected to phase out an additional 75.74 ODP tonnes of HCFC-141b. Funding was approved for the equipment conversion at two Article 5-owned systems houses, various forms of technical assistance to all systems houses and distributors and for the conversion of SMEs. One local (Technocom) and one non-Article 5-owned (Dow) systems house converted; no funding from the Multilateral Fund for equipment conversion was provided to Dow; however, technical assistance for the introduction of alternative foam blowing agents to downstream users was funded. Both systems houses are currently developing formulations with water, HFOs, HFC-245fa, HFC-365 and HFC-227. One systems house has withdrawn from the project (Obeigi) and a memorandum of agreement (MOA)⁶ with another (Baalbaki) is expected to be signed. A total of 24 downstream users were assisted. The conversion of all downstream users is expected to be completed by the end of 2019.

Enabling activities in the RAC sector

24. The Egyptian Programme for Promoting Low-GWP Refrigerants' Alternatives (EGYPRA) initiative was launched in 2014 to assess low-GWP alternatives in the domestic and commercial air-conditioning (AC) sector: two meetings were held with AC manufacturers and technology suppliers, components and refrigerant samples have been provided to manufacturers and domestic and commercial AC prototypes have been built, performance testing of domestic AC prototypes has been completed with a report on findings drafted and under review.

Project implementation and monitoring unit

25. To implement HPMP activities an HPMP Coordinating Unit has been established within the NOU (located at EEAA).

Level of fund disbursement

26. As of August 2018, of the US \$5,200,000⁷ approved so far, US \$3,171,515 had been disbursed (US \$1,151,663 for UNIDO and US \$2,019,852 for UNDP) as shown in Table 3. The balance of US \$2,028,485 will be disbursed in 2018 and 2019.

⁶ UNDP's project implementation arrangement.

⁷ In addition, US \$2,371,840 plus agency support costs was approved for six investment projects at the 62nd meeting and included in stage I (excluding funding for Delta Electric Appliances that subsequently withdrew from stage I).

Table 3. Financial report of stage I of the HPMP for Egypt (US \$)

Agency	First tranche		Second tranche		Total approved	
	Approved	Disbursed	Approved	Disbursed	Approved	Disbursed
UNIDO	950,000	938,494	250,000	213,169	1,200,000	1,151,663
UNDP	2,000,000	1,113,438	2,000,000	906,414	4,000,000	2,019,852
Total	2,950,000	2,051,932	2,250,000	1,119,583	5,200,000	3,171,515
Disbursement rate (%)	70		50		61	

Implementation plan for the third tranche of the HPMP

27. The following activities will be implemented between September 2018 and December 2019:
- The remaining systems houses will develop non-HCFC-141b pre-blended polyols and remaining 57 downstream users will be assisted (UNDP) (US \$716,400);
 - Continuation of EGYPRA initiative: testing of the commercial AC prototypes and dissemination of results and technical assistance to the domestic AC manufacturers (design optimization of the prototypes built in earlier tranches and results dissemination) (UNIDO) (US \$146,000); and
 - Continuation of project monitoring activities (e.g. visits to enterprises and developing technical specifications) (UNIDO) (US \$86,575).

SECRETARIAT'S COMMENTS AND RECOMMENDATION**COMMENTS**Report on HCFC consumption

28. The Secretariat noted that the total HCFC consumption in 2017 (346.46 ODP tonnes) was 0.3 per cent lower than the targets established in the Agreement with the Executive Committee for that year and 20 per cent higher than the target in 2018 and enquired about the ability of the country to comply with the Agreement. UNIDO clarified that Egypt is fully committed to the implementation of the Montreal Protocol; the activities planned under the HPMP will ensure compliance with the targets established in its Agreement with the Executive Committee; HCFC import quotas for 2018 are established in accordance with the allowable HCFC consumption in the Agreement; and the pre-shipment approvals given to all importers, as of October 2018, indicate that the consumption will be less than the available quota for 2018.

Progress report on the implementation of the second tranche of the HPMP*Legal framework*

29. The Government of Egypt has issued HCFC import quotas for 2018 at 289.7 ODP tonnes, which is at the level of the maximum allowable consumption and lower than the Montreal Protocol control targets.

Manufacturing sector

30. At the 62nd meeting, the Executive Committee approved US \$386,100, plus agency support costs for the conversion of Cairo Foam enterprise from HCFC-141b to n-pentane⁸. The cost was calculated based on the technology chosen (n-pentane). Cairo Foam instead opted to convert to MF due to safety concerns

⁸ Decision 62/32(a).

at the enterprise. While the Secretariat noted the need to change technology due to safety concerns, it recalled the provisions related to changes in technology specified in paragraph 7(c) of the Agreement.⁹

31. Based on the change of technology to MF, the following incremental costs were agreed: retrofit/acid proof of the two mixing head dispenser (US \$60,000) plus contingencies (US \$6,000), training (US \$40,000), trials and testing (US \$30,000), and incremental operating costs of US \$126,900, consistent with Fresh Electric Home Appliances, the other enterprise that converted to MF under stage I. Accordingly, the total cost of the conversion was calculated at US \$262,900, which results in a return of US \$123,200 plus agency support costs to the 82nd meeting.

32. The Secretariat noted the substantial delay in the conversion of 81 SMEs and 350 micro users through systems houses, which had been expected to be completed by August 2013. In particular, only 24 SMEs and two systems houses were converted so far, one systems house has withdrawn from the project (Obeigi), and the MOA with another (Baalbaki) is still to be signed. Noting that the Government of Egypt banned the import of HCFC-141b in pre-blended polyols as of 1 January 2018 and committed to ban import, use and export of HCFC-141b in bulk and the export of HCFC-141b contained in pre-blended polyols by 1 January 2020; and that stage I of the HPMP is to be completed by 31 December 2019, the following was agreed:

- (a) UNDP will provide to each meeting through the completion of stage I, a comprehensive progress and financial report on the status of conversion of the systems houses, and the 81 SMEs and 350 micro users in the foam sector (including the status of systems houses conversion, formulations developed and disbursement; an updated list of SMEs converted with the selected technology, disbursement and commitment for each SME; and an update on the number of micro users assisted);
- (b) Stage I of the HPMP will be financially completed and all remaining balances returned by 31 December 2020; and the project completion report, including the stand-alone conversion projects approved at the 62nd meeting and incorporated in stage I, will be submitted to the first meeting in 2020; and
- (c) The second tranche request of stage II could only be submitted if the following conditions have been met:
 - (i) MOA was signed with Baalbaki;
 - (ii) At least 40 SMEs included in stage I have been converted;
 - (iii) Of the US \$929,944 committed funding for the systems houses project from the first and second tranches of stage I (as per progress report submitted) and the further US \$716,400 allocated to this component under the third and final tranche, UNDP had disbursed at least an additional US \$350,000 to final beneficiaries in the systems house project.

33. Two systems houses (Dow and Technocom) are developing formulations with HFC-245fa, HFC-365mfc and HFC-227ea, substances controlled under the Kigali Amendment, notwithstanding that the use of high-GWP alternatives had been expected to be temporary, and their use phased out by 2015 at the latest. The Secretariat therefore suggested that if any of the 81 SMEs assisted under stage I had not yet completed the conversion to low-GWP alternatives, as agreed, and instead still consumed HFCs after 1 January 2020 (or when the starting point is established for HFCs, whichever is earlier), that this

⁹ Annex XXIV of document UNEP/OzL.Pro/ExCom/65/60.

consumption of HFCs would be deducted from the country's starting point for HFCs, and that those SMEs would not be eligible for further funding from the Multilateral Fund for the HFC phase-down.

34. UNDP confirmed that no further assistance would be requested for the downstream users that had received assistance under stage I systems houses project as they agreed to convert to low-GWP technologies. Nonetheless, the country was not in a position to agree to the Secretariat's suggestion as the country had not yet ratified the Kigali Amendment and no HFC control obligations were yet in force. The Secretariat is seeking the Executive Committee guidance on this matter.

Conclusion

35. The Government is enforcing a licensing and quota system for the import and export of HCFCs, and consumption in 2017 is below the control targets of the Montreal Protocol and those stipulated in the Agreement with the Executive Committee. The ban on the import of HCFC-141b in pre-blended polyols is in place since 1 January 2018. The overall disbursement rate is 61 per cent. The ban on the import, use and export of HCFC 141b in bulk and the export of HCFC-141b contained in pre-blended polyols is to be established by 1 January 2020. The conversion of nine enterprises in the foam manufacturing sector has been completed, one of which changed technology from n-pentane to MF, resulting in savings of US \$123,200, plus agency support costs, that will be returned to the 82nd meeting. Technical assistance activities in the RAC sector are being successfully implemented with both domestic and commercial AC prototypes built. There is a five-year delay in the conversion of 81 SMEs through the support to their systems houses. Two systems houses have developed formulations with high-GWP alternatives. The Government committed to accelerate the conversions of SMEs, to complete stage I of the HPMP by 31 December 2019, and financially, with the return of any remaining balances, by 31 December 2020. The Secretariat is seeking the Executive Committee's guidance on whether to consider deducting from the country's starting point for HFCs the consumption of HFCs at SMEs that still had such consumption after 1 January 2020.

RECOMMENDATION

36. The Executive Committee may wish to consider:

- (a) Noting:
 - (i) The progress report on the implementation of the second tranche of stage I of the HCFC phase-out management plan (HPMP) for Egypt;
 - (ii) The return of US \$123,200, plus agency support costs of US \$9,240 from UNDP, to the 82nd meeting associated with the savings from the change in conversion technology at the Cairo Foam enterprise (EGY/FOA/62/INV/108);
 - (iii) The return of US \$44,654, plus agency support costs of US \$3,382 from UNDP, to the 82nd meeting associated with the savings from the conversion of the two foam enterprises (Fresh Electric Home Appliances (EGY/FOA/62/INV/106) and MOG Engineering and Industry (EGY/FOA/62/INV/105));
 - (iv) The commitment of the Government of Egypt, to submit the project completion report for stage I of the HPMP to the first meeting in 2020; and financially complete stage I and return any remaining balances by 31 December 2020;

- (b) Requesting:
- (i) The Government of Egypt and UNDP to submit to each meeting through the completion of stage I, a report on the status of conversion of the systems houses, and the 81 small and medium enterprises (SMEs) and 350 micro users (including the status of systems houses conversion, formulations developed and disbursement; an updated list of SMEs converted with the selected technology, disbursement and commitment for each SME; and an update on the number of micro users assisted);
 - (ii) The Government of Egypt and UNIDO to submit progress reports on a yearly basis on the implementation of the work programme associated with the final tranche of stage I through the completion of the project;
 - (iii) UNDP to continue assisting the Government of Egypt in securing the supply of the alternative technologies selected for conversion of 81 SMEs through their system houses; and
 - (iv) UNDP to report to the Executive Committee on the status of use of the interim technology selected by the Government of Egypt at each meeting until a low-global warming potential (GWP) technology, as agreed, had been fully introduced, along with an update from the suppliers on the progress made towards ensuring that the selected technologies, including associated components, were available on a commercial basis in the country;
- (c) Approving the third and final tranche of stage I of the HPMP for Egypt and the corresponding 2018-2019 tranche implementation plan, at the amount of US \$1,020,148, consisting of US \$232,575, plus agency support costs of US \$17,443 for UNIDO; and US \$716,400, plus agency support costs of US \$53,730 for UNDP, on the understanding that the second tranche request of stage II could only be submitted if the following conditions have been met:
- (i) The memorandum of agreement was signed with Baalbaki;
 - (ii) At least 40 SMEs included in stage I under the systems houses project have been converted;
 - (iii) That UNDP had disbursed at least an additional US \$350,000 from the funding approved for the systems houses project to final foam beneficiaries; and
- (d) Whether or not to deduct from the country's starting point for sustained aggregated reductions for the consumption of HFCs the consumption, if any, of HFCs by the 81 SMEs assisted under stage I after 1 January 2020 or when the starting point is established for HFCs, whichever is earlier, noting that those SMEs agreed to convert to low-GWP technologies.



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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Eighty-first Meeting
Montreal, 18-22 June 2018

PROJECT PROPOSAL: EGYPT

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

Refrigeration

- Conversion of discontinuous panel manufacturing facility from HFC-134a to HFO blowing agent at Army Factory

UNDP

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT

EGYPT

PROJECT TITLE(S)

BILATERAL/IMPLEMENTING AGENCY

(a) Conversion of discontinuous panel manufacturing facility from HFC-134a to HFO blowing agent at Army Factory, Egypt.	UNDP
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NATIONAL CO-ORDINATING AGENCY

Egyptian Environmental Affair Agency (EEAA)

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (METRIC TONNES, 2017, AS OF MAY 2018)

Annex F, Group I	mt	n/a
	mt CO ₂ -eq.	n/a

B: COUNTRY PROGRAMME SECTORAL DATA (METRIC TONNES, 2017, AS OF MAY 2018)

Annex F, Group I	mt	n/a
	mt CO ₂ -eq.	n/a

HFC consumption remaining eligible for funding	mt	n/a
	mt CO ₂ -eq.	n/a

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US \$	Phase-out ODP tonnes
	(a)	n/a	n/a

PROJECT TITLE:	Army Factory	
HFC-134a used at enterprise:	mt	55.5
	mt CO ₂ -eq.	79,365
HFC-134a to be phased out through this project:	mt	55.5
	mt CO ₂ -eq.	79,365
HFO to be phased in:	mt	35.52
	mt CO ₂ -eq.	107
Project duration (months):		24
Initial amount requested (US \$):		1,007,400
Final project costs (US \$):		
Incremental capital cost:		
Contingency (10%):		
Incremental operating cost:		
Total project cost:		
Local ownership (%):		100
Export component (%):		0
Requested grant (US \$):*		1,007,400
Cost-effectiveness*:	US \$/kg	18.15
	US \$/mt CO ₂ -eq.	12.71
Implementing agency support cost (US \$):*		70,518
Total cost of project to Multilateral Fund (US \$):*		1,077,918
Status of counterpart funding (Y/N):		N
Project monitoring milestones included (Y/N):		Y
SECRETARIAT'S RECOMMENDATION	For individual consideration	

* As submitted.

PROJECT DESCRIPTION

1. On behalf of the Government of Egypt, UNDP has submitted a project proposal to convert the manufacturing of discontinuous panels using HFC-13a as foam-blowing agent to HFOs in Army Factory, Egypt at a total cost of US \$1,007,400, plus agency support costs of US \$70,518, as originally submitted including. At the 80th meeting, US \$30,000, plus agency support costs of US \$2,100, was approved for the preparation of this project.

2. In line with decisions 78/3(g) and 79/45, the endorsement letter from the Government of Egypt for the project indicates the Government's intention to ratify Kigali Amendment;¹ that the Government is aware that no further funding would be available until the instrument of ratification of the Kigali Amendment had been received by the depositary at the United Nations Headquarters in New York, if this project would be approved by the Executive Committee; and that the Government acknowledges that in case this project is approved, any HFC reduced would be deducted from its starting point (which may be agreed in the future).

HFC consumption and sector background

3. The project proposal did not include information on total HFC consumption nor information on HFC-134a consumption in the polyurethane (PU) foam industry in Egypt. The project proposed indicated that there is at least one other foam manufacturer in Egypt using HFCs; but it did not include information on the type of HFC being used and the level of consumption.

Global use of HFC-134a in the foam sector

4. Based on the TEAP Task Force Report submitted to the Twenty-eighth Meeting of the Parties,² in 2015 the consumption of HFC-134a in the foam sector in Article 5 countries amounted to 3,364 metric tonnes (mt), representing 4.2 per cent of total HFC-134a consumption. This amount represented the total consumption used as a blowing agent for extruded polystyrene (XPS) and PU foams, though their relative proportions of HFC-134a consumption is not available.

5. Information from the surveys on ODS alternatives for 119 Article 5 countries submitted to the 80th meeting,³ shows that the consumption of HFC-134a in the foam sector accounted for 1.46 per cent of the total HFC-134a consumption in 2015. Further, it is also noted that only four countries (of the 119 covered in the survey) have reported HFC-134a consumption in PU foam applications.

PU foam industry in Egypt

6. The PU foam industry, mainly manufacturing rigid foam and, to a lesser degree, integral skin products, plays a significant role in the economy of Egypt. Foam manufacturers rely heavily on chemical and technology supply through systems houses, and mainly use HCFC-141b as a blowing agent. During the implementation of stage II of the HPMP⁴ approved at the 79th meeting, the Government has agreed to fully replace the use of HCFC-141b (pure and contained in imported pre-blended polyols) with hydrocarbon (HC-) or HFO-based polyol systems by 1 January 2020.

Enterprise background

7. The Army Factory is not a commercial enterprise; it undertakes construction projects for the Army, producing discontinuous foam for sandwich panels and for construction applications such as cold stores, prefabricated housing, and other uses. The enterprise also has spray/pour-in-place (PIP) foam operations.

¹ Letter dated 29 April 2018, from the Ozone Unit, Egyptian Environmental Affairs Agency, to UNDP.

² TEAP XXVII/4 Task Force Report, September 2016.

³ UNEP/OzL.Pro/ExCom/80/54

⁴ UNEP/OzL.Pro/ExCom/79/32

8. The Army Factory was one of the enterprises that received funding under a foam sector project approved at the 22nd meeting for conversion from CFC-11 to HFC-134a.⁵ This conversion was unique given that HFC-134a was chosen by the Army as they required the use of a non-flammable blowing agent, while the other enterprises selected cyclopentane. The project was successfully completed in 2003. The funding request submitted to the 81st meeting relates to the conversion of that manufacturing operation to HFOs that are not flammable.

HFC consumption by the enterprise

9. The Army Factory reported a consumption of 55.5 mt of HFCs in 2017. The fluctuation in consumption of HFC-134a in previous years is driven by the demand for foam manufacturing by the Army (Table 1).

Table 1. Consumption of HFC-134a at Army Factory

Year	Quantity	
	Metric tonnes	CO ₂ - eq
2015	60.10	85,943
2016	33.80	48,334
2017	55.50	79,365
Average (2015-2017)	49.80	71,214

Project overview and funding request

Selection of alternative technology

10. Army Factory needs to adopt a final technology to replace HFC-134a which is non-flammable and demonstrates good foam insulation properties. On this basis, HFO was selected as the alternative blowing agent. The proposal indicated that the choice will be either HFO-1233zd(E) or HFO-1336mzz. In line with decision 74/20, commercial availability of HFOs in Egypt was confirmed by two chemical producers and one systems house that they can make available formulations using HFOs, though specific dates of availability were not provided.⁶

Project description

11. The project proposes to replace the current high pressure (HP) foaming equipment, that is more than 15 years old, with a new high-pressure foam machine and a spare mixing head, as the age of the foam machine makes it difficult for the enterprise to use it with HFOs, and need for provisions for co-blowing with other blowing agents. The project also includes costs relating to technical assistance for the development of new HFO formulations, trials, safety audit, and international seminar and project support. Incremental operating cost (IOC) is requested based on the proposed HFO formulation.

Project costs

12. The incremental capital costs (ICC), as originally submitted, amounts to US \$297,000 as shown in Table 2.

⁵ EGY/FOA/22/INV/64

⁶ Letters from Honeywell, Chemours and Technocom, submitted to UNDP.

Table 2: ICC for conversion to HFOs at Army Factory

Description	Cost (US\$)
High pressure dispenser	130,000
Spare mixing head	20,000
Technical support	50,000
Trials	40,000
Safety audit	10,000
International seminar and project support	20,000
Contingencies	27,000
Total	297,000

13. The IOCs calculated on the costs of the different foam blowing agents, as originally submitted, amounts to US \$710,400, as shown in Table 3.

Table 3. IOC to HFOs at Army Factory

Particulars	HFC-134a			HFO		
	US \$/kg	Percentage		US \$/kg	Percentage	
	(a)	(b)	(c)=(a) x (b)	(d)	(e)	(f)=(d) x (e)
Polyol	2.80	40	1.12	2.80	36	1.01
Isocyanate	3.00	50	1.50	3.00	50	1.50
Blowing agent	7.10	10	0.71	15.00	14	2.10
Total			3.33			4.61
Incremental cost of systems using HFOs (US \$/kg of system)						1.28
Incremental cost of systems using HFOs (US \$/kg of HFC-134a)						12.80
Consumption of HFC-134a (2017) (mt)						55.50
IOC (US \$)						710,400

14. The total cost of the project amounts to US \$1,007,400, plus agency support costs, with a cost-effectiveness of US \$18.15/kg. The project would be implemented over a period of 24 months.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Eligibility

15. The Secretariat reviewed the project proposal based on the current policies and decisions of the Multilateral Fund; review of similar PU foam projects for conversion to HFO technology; and in the light of decision 78/3(g) which is primarily to gain experience in the ICCs and IOCs that might be associated with phasing down HFCs in Article 5 countries.

Replicability

16. Upon request for additional information on the replicability of this project, UNDP explained that there could be other Article 5 countries not covered in the surveys on ODS alternatives, that are consuming HFC-134a or other HFCs (e.g., HFC-245fa) in PU foam applications; the results of the project could benefit conversion of those foam applications.

17. The Secretariat considers that the replicability of this project is limited for the following reasons: it appears that Army Factory is the only enterprise using HFC-134a for PU foam in Egypt; the TEAP Task Force report on ODS alternatives shows that HFC-134a consumption in both XPS and PU foam in Article 5 countries represented only 4.2 per cent of global HFC-134a consumption; the report on the surveys on ODS alternatives covering 119 Article 5 countries indicated that HFC-134a in PU foam applications was only used in four countries; and only two projects (with a total consumption of 30.8 mt of CFC-11) out of the 989 projects approved to phase-out 68,863 mt of CFC-11 in foam sector were converted to HFC-134a.

Maturity of technology

18. Upon a request of additional information on maturity of technology using HFO-1233zd(E) and HFO-1336mzz, UNDP mentioned that new formulations would be developed in the Army Factory and/or a local systems house during the implementation of the project, and will include formulations co-blown with other agents for cost-effectiveness and meeting the requirement of discontinuous panels produced in the Army Factory. Details of formulation and co-blowing agents were not provided. UNDP clarified that the Government of Egypt and the Army Factory are committed to adopting HFO-based formulation in this enterprise.

19. The Secretariat considers that additional efforts are needed for formulation development using HFOs. The Secretariat also notes that experience on the use of HFO as a blowing agent under the Multilateral Fund is being gained through:

- (a) The demonstration project to validate the use of HFO for discontinuous panels in Article 5 parties through the development of cost-effective formulations in Colombia,⁷ approved at the 76th meeting for UNDP. The comprehensive report on this project has been submitted to the 81st meeting;⁸
- (b) Implementation of HPMPs in several Article 5 countries (e.g., Jordan⁹, Lebanon, Malaysia) where foam enterprises had agreed to replace HCFC-141b with HFO-blowing agents.

Availability of HFOs

20. Upon a request for additional clarification on the availability of HFOs in the local market, UNDP informed that two chemical manufacturers, and one systems house operating in Egypt have confirmed that HFOs will be available in Egypt. It is noted that foam enterprises are currently facing difficulties in securing sufficient supply of HFOs for their conversion from HCFC-141b; however, the situation is expected to change in the future.

⁷ UNEP/OzL.Pro/ExCom/76/26

⁸ UNEP/OzL.Pro/ExCom/81/10

⁹ Table 5 in page 8, UNEP/OzL.Pro/ExCom/77/51

Regulatory framework and sustainability

21. UNDP advised that the Government is committed to implement the project at Army Factory; however, at this time the Government is not considering issuing regulations relating to limiting the use of HFC-134a in PU foam applications.

22. On a clarification on how the enterprise would sustain high cost of the HFO-based formulation (i.e., US \$15.00/kg for HFOs compared to US \$7.10/kg for HCFC-134a), UNDP explained that during project implementation, HFO-based formulations would be developed with the aim to lower cost and, through this, sustainability of HFO adoption would be ensured.

Selection of enterprise

23. The Secretariat notes that the Army Factory received funding from the Multilateral Fund in 1997 to convert from CFC-11 as a blowing agent to HFC-134a. As such, the Secretariat considers that this conversion falls under paragraph 18(b) of decision XXVIII/2.

Incremental cost calculations

24. Upon a request for clarification on the requirements of a new HP foam machine that replaces the 15 year-old HP foam machine, UNDP mentioned that the old foam machine cannot be used with HFOs as equipment spares and components are not easily available and the provisions for co-blowing with other agents is not available.

25. The Secretariat thoroughly considered the eligibility of the request for replacement of the current 15 year-old HP foam machine based on the following:

- (a) The Army Factory currently uses HFC-134a as a blowing agent in the existing foam machine as they need a non-flammable blowing agent; accordingly the enterprise selected HFO-1233zd(E) or HFO-1336mzz as blowing agent;
- (b) The technical report on calculation of the ICCs and IOCs for foam sector alternatives submitted to the 76th meeting,¹⁰ stated that for the conversion from HCFCs to HFCs, HFOs, water-based systems or methyl formate technologies, no additional capital costs for replacing HP dispensers will be required for rigid PU and integral skin foam applications;
- (c) The report of the demonstration project to validate the use of HFO for discontinuous panels (previously mentioned), did not indicate a need for replacing or retrofitting HP foam machine for using HFO formulations;
- (d) Projects approved for PU foam conversion in discontinuous panels to HFOs approved under HPMPs in several Article 5 countries did not request funding for replacement of HP foam equipment as the HP equipment in the baseline can be used with the alternative blowing agent; and
- (e) Projects approved for replacing HCFC-141b to flammable-based blowing agents considered first the option to retrofit the HP equipment on the baseline; in case a low-pressure (LP) foam machine was in the baseline, appropriate equipment, including its replacement with a HP machine, was considered to take care of flammability of the blowing agent.

¹⁰ Paragraph 66 of Annex I, UNEP/OzL.Pro/ExCom/76/58

26. In light of the above facts, the Secretariat considers that the request for the replacement of existing HP foam dispenser and a spare mixing head are not eligible incremental costs.

27. The Secretariat also reviewed the other ICCs and considered the requirement for technical assistance to develop new formulations and trials and testing at US \$15,000 each are eligible incremental costs. However, costs related to safety audit would not be incremental as this would need to be carried out as a part of the regular business operations, and the request for international seminar is not a requirement for implementing this project. In light of the above, the Secretariat recommended that the US \$30,000 associated with these activities, be used for additional technical assistance for development of cost-effective foam formulations, through trials and testing.

28. In reviewing the IOCs, the Secretariat noted that the HFO formulation proposed includes 14 per cent of HFOs in place of 10 per cent of HFC-134a in the system, resulting in a much higher cost of HFO-based system. During project consultations, UNDP mentioned that the specific formulations and the HFO to be used have not yet been finalised, though they propose to use HFO-1233zd(E) or HFO-1336mzz as blowing agents.

29. Based on the experiences from other PU foam projects approved for the conversion to HFOs in discontinuous panels, and on available technical reports on HFO formulations (including the comprehensive demonstration projects on use of HFOs in discontinuous panels approved by the Executive Committee), the Secretariat calculated IOCs based on a reduced HFO formulation noting that the technical assistance support included in the project cost would be used to develop and optimize cost-effective HFO-based formulations that would meet product performance requirements.

30. Based on the analysis of ICC and IOC, the Secretariat estimated that the eligible incremental cost for the conversion at Army Factory amounts to US \$224,694 at a cost-effectiveness of US \$4.05/kg or US \$2.83 mt CO₂-eq. Table 4 provides a summary of the incremental costs as originally submitted, as revised by UNDP during the discussions, and as proposed by the Secretariat.

Table 4: Incremental costs for conversion to HFOs at Army Factory

Description	Cost (US \$)		
	As submitted	Revised	Secretariat proposal
Incremental capital cost	297,000	225,500	30,000
Incremental operating cost	710,400	471,750-710,400	194,694
Total	1,007,400	697,250-935,900	224,694
HFC-134a phased out (mt)	55.50	55.50	55.50
Cost effectiveness (US \$/kg)	18.15	12.56 – 16.86	4.05
Cost effectiveness (US \$/ mt CO₂-eq.)	12.69	8.79 – 11.79	2.83

31. UNDP and the Secretariat could not agree on the overall cost of the project.

32. The Secretariat notes that the purpose of implementing projects under decision 78/3(g) is to gain experience in the ICCs and IOCs that might be associated with phasing down HFCs. The Secretariat, however, considers that the cost estimates might change as more information becomes available on the technology and according to the specific characteristics of the enterprises.

Climate benefits

33. The project is expected to result in emissions reduction of 79,365 mt CO₂-eq with the reduction of 55.5 mt of HFC-134a, and the expected introduction of HFOs. No estimates of indirect emission savings associated with energy efficiency were provided.

Business plan 2018 -2020

34. This project is included in the 2018–2020 business plan of the Multilateral Fund at a value of US \$405,966, including agency support costs.

Conclusion

35. The Secretariat considers the replicability of the project proposal is uncertain, given the very limited use of HFC-134a as a PU foam blowing agent globally and in Article 5 countries; and the small number of potential PU foam enterprises in Article 5 countries using HFC-134a as a blowing agent. It is expected that the project would enable the phase-out of HFC-134a PU foam manufacturing in only one enterprise in Egypt. UNDP and the Secretariat could agree on the overall cost of the project, which is maintained by UNDP in the range of US \$697,250 to US \$935,900 after adjustments, while the Secretariat’s estimated cost is US \$224,694.

36. Notwithstanding that agreement on the level of funding could not be reached, the Secretariat considered necessary to submit the project proposal, given the urgent requirement of the Executive Committee to gain experience in the ICCs and IOCs that might be associated with phasing down HFCs in Article 5 countries in light of decision XXVIII/2.

RECOMMENDATION

37. The Executive Committee may wish to consider:

- (a) The project proposal for the conversion of from HFC-134a to HFO in the manufacture of discontinuous panels in Army Factory, Egypt, in the context of its discussion on HFC stand-alone project submitted to the 81st meeting in line with decision 78/3(g), as described in the document on the Overview of issues identified during project review (UNEP/OzL.Pro/ExCom/81/14); and
- (b) Whether or not to approve the project proposal in light of the information presented in the document.