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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Sixty-second Meeting
Montreal, 29 November - 3 December 2010

PROJECT PROPOSAL: SYRIAN ARAB REPUBLIC

Phase-out

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

• Phase-out of HCFC-22 and HCFC-141b from the manufacture of unitary air-conditioning equipment and rigid polyurethane insulation panels at Al Hafez Group	UNIDO

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECTS
Syrian Arab Republic

PROJECT TITLE		BILATERAL/IMPLEMENTING AGENCY
(a)	Phase-out of HCFC-22 and HCFC-141b from the manufacture of unitary air-conditioning equipment at rigid PU insulation panels at Al Hafez Group	UNIDO

NATIONAL CO-ORDINATING AGENCY	NOU, Ministry of State for Environment Affairs

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2008, AS OF NOVEMBER 2010)

Annex C, Group I	96.8

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2009, AS OF NOVEMBER 2010)

Substance	Consumption by sector (ODP tonnes)						
	Aerosol	Foam	Ref. manu.	Ref. serv.	Solvent	Other	Total
HCFC-22			42.89	27.50			70.40
HCFC-141b		33.00	38.07				71.07
HCFC-141b in imported pre-blended polyol		9.75					

HCFC consumption remaining eligible for funding (ODP tonnes)	n/a

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US $	Phase-out (ODP tonnes)
	(a)	898,000	5.9

PROJECT TITLE:	(a)
ODS use at enterprise (ODP tonnes):	12.9
ODS to be phased out (ODP tonnes):	12.9
Project duration (months):	30
Project costs (US $):	
Incremental Capital Cost:	982,300
Contingency (10 %):	
Incremental Operating Cost:	483,061
Total Project Cost:	1,465,361
Local ownership (%):	100
Export component (%):	Nil to non-A5
Requested grant (US $):	1,465,361
Cost-effectiveness (US $/kg):	9,02
Implementing agency support cost (US $):	109,902
Total cost of project to Multilateral Fund (US $):	1,575,263
Status of counterpart funding (Y/N):	Y
Project monitoring milestones included (Y/N):	Y

SECRETARIAT'S RECOMMENDATION:	For individual consideration

PROJECT DESCRIPTION

1. UNIDO, on behalf of the Government of the Syrian Arab Republic, submitted to the 62nd Meeting the project "Phase-out of HCFC-22 and HCFC-141b from the manufacture of unitary air-conditioning equipment and rigid polyurethane insulation panels at Al Hafez Group". Project preparation funding for HCFC phase-out investment activities in the refrigeration manufacturing sector had been approved at the 58th Meeting. The enterprise is a large manufacturer of air-conditioning (AC) equipment, consuming 90.6 metric tonnes (mt) (4.98 ODP tonnes) of HCFC-22 and 71.8 mt (7.90 ODP tonnes) of HCFC-141b.

Background

2. UNIDO submitted the project to the 61st Meeting at an initial requested cost of US $1,780,392 plus agency support costs. Although an agreement was reached on the major cost items before that meeting, the Secretariat did not forward the project to the Executive Committee as it did not contain the information necessary to be considered as potentially approvable. The Executive Committee, in decision 61/19, requested UNIDO to resubmit a project proposal with two options relating to:

(a) Phase-out of HCFC-22 and HCFC-141b from the manufacture of unitary air-conditioning equipment and rigid polyurethane insulation panels at Al Hafez Group;

(b) Phase-out of HCFC-141b only from the manufacture of rigid polyurethane insulation panels at Al Hafez Group.

3. The Executive Committee also requested UNIDO to include in the proposal additional justification for the submission of the HCFC phase-out investment project in advance of the HCFC phase-out management plan and detailed information on the HCFC-141b foam sector and justification for the intended prioritization of the phase-out of HCFC-22 on the basis of national circumstances.

HCFC consumption

4. The country consumes both HCFC-22 as well as HCFC-141b as shown in Table 1. In the last five years, the trend for the HCFC-22 consumption is upward, although there are reductions in some years as compared to the previous year. For HCFC-141b, data has only been reported as of 2003. The data shows a very irregular trend with a significant increase in the years 2008 and 2009 as compared to previous data.

Table 1: Consumption of HCFC based on Article 7 reporting data except where otherwise indicated

Substance in ODP tonnes	**Year**							
	2002	2003	2004	2005	2006	2007	2008	2009
HCFC-123	0	0	0	0	0.02	0.04	0.02	0*
HCFC-141b	0	0	8.8	26.06	6.12	6.49	40.84	71.07**
HCFC-142b	0	0	0	0.04	0.1	0.12	2.18	5.76***
HCFC-22	10.83	34.62	35.92	34.10	42.59	38.65	53.78	70.35**
Total	10.83	34.62	44.72	60.20	48.83	45.30	96.82	147.18

* No information provided
** According to country programme reporting
*** No information in country programme reporting but provided in project proposal

5. HCFC-22 is used in the refrigeration and air-conditioning manufacturing and in the refrigeration servicing sectors. In 2009, the consumption of HCFC-22 amounted to 1,280 mt (70.35 ODP tonnes). In addition, the Syrian Arab Republic also consumes 88.6 mt (5.76 ODP tonnes) of HCFC-142b in 2009. The total HCFC consumption of the Syrian Arab Republic is 147.2 ODP tonnes according to the project proposal, which is consistent with the 2009 country programme data amended by some consumption of HCFC-142b specified in the project proposal.

6. The Government of the Syrian Arab Republic selected as a starting point the average of the HCFC consumption of 2009 and 2010, i.e. the baseline consumption of the country. The Syrian Arab Republic used the reported country programme data for 2009 and estimated an increase of 12 per cent of its consumption between 2009 and 2010. Therefore, the resulting calculated baseline and the estimated starting point would be 156 ODP tonnes, of which this project will phase-out 12.88 ODP tonnes. The country assumes an increase in HCFC consumption in future years of 20 per cent per year, based on a growth scenario related to the consumption between the years 2000 and 2008. The consumption trend, although highly irregular, could be described *inter alia* as a trend of 20 per cent growth per year.

Company description

7. The Al Hafez Group (Al Hafez) is a privately owned group of companies, established in the 1970s, with factories, retail, and service centres located in the main Syrian cities and in Egypt, Iraq, Lebanon, and Sudan. In 1985, the company started the manufacturing industrial water chillers and central air-conditioning units. In 1990 they started the production of domestic refrigerators and split air-conditioners. The company has three major plants in the Syrian Arab Republic; in addition, currently a plant is being established in Egypt.

8. Al Hafez's refrigeration and air-conditioning products include chillers, packaged AC, ducted split AC, ice-block makers, ice banks and split AC. All products are designed for the climate in the country and the region with atmospheric temperatures up to 45^{o}C. The company also manufactures insulation panels of various sizes. Al Hafez sources HCFC-22 in 13.5kg cylinders from India and the premixed polyurethane materials from system houses in the country.

9. For the year 2008, the enterprise's HCFC usage amounting to 12.9 ODP tonnes represents as much as 13 per cent of the country's total HCFC consumption of 96.8 ODP tonnes, and it is expected that the reduction by this project will constitute the major part of the country's reduction obligation in 2015.

10. The project is to phase-out the use of 90.6 mt (5.0 ODP tonnes) of HCFC-22 and 71.8 mt (7.9 ODP tonnes) of HCFC-141b by converting to HFC refrigeration technology, pentane foam blowing technology and non-HCFC cleaning technology, thereby contributing to a great extent to the country's 2013 and 2015 obligations under the Montreal Protocol.

Conversion activities

11. A redesign of the large quantity of models is necessary, *inter alia* to achieve the maximum efficiency of the air-conditioning equipment, since the theoretical thermodynamic efficiency of R-410A is slightly lower than that of HCFC-22. Al Hafez plans to fabricate representative models of chillers, packaged AC, split AC and ice machines, and test them in the test chamber as well as in the field.

12. The project foresees to retrofit one foaming machine, and to install a pentane supply system from drums. In order to use the existing three foaming stations with their specific moulds and presses, three mixing heads with nitrogen supply function will be provided, and a related nitrogen system for the existing moulds/press will be added. A ventilation system with hydrocarbon sensors and two-speed fans as well as an alarm system is to be installed. Safety training will be provided, and the safety of the set-up

will be certified. In order to replace the use of 21.4 mt (2.4 ODP tonnes) of HCFC-141b as a solvent for cleaning in the production, a new water jet system will be installed.

13. The refrigeration system will also be converted through the installation of new charging units for liquid refrigerants and includes precise electronic balance, diffuser and control, leak detectors for HFCs, and tools for post-production repair. It also includes an awareness component to ensure proper identification and resulting service of the units in the field.

14. Depending on the outcome of discussions related to the funding for the conversion of heat exchanger manufacturing, high-pressure air compressors, new tooling for the hairpin-bender machine and tube expander machine, new test couplings and an additional cooling system for the tooling would be provided. The fin press machine would be modified to produce fin-coil heat exchangers for R-410A refrigerant.

15. Incremental operating costs have been determined for a duration of one year. In case of the conversion of the air-conditioning manufacturing, the costs were calculated to be above the threshold of US $6.30/kg for HCFC-22, and were consequently capped at that value. For the foam system, incremental costs of US $0.28/kg of HCFC-141b were determined, and multiplied with the HCFC-141b consumption for the foam blowing of 50.37 tonnes. Incremental operating cost related to the conversion of cleaning is not requested. Table 2 shows an overview of the agreed costs.

Table 2: Agreed incremental cost overview

Cost item	**Project cost without conversion of heat exchanger manufacturing (US $)**	**Additional cost for conversion of heat exchanger manufacturing (US $)***	**Costs for HCFC-141b conversion only (US $)****
Incremental capital costs			
Redesign and prototyping	385,000		
Modification of heat-exchanger		130,000	
Conversion of cleaning equipment	80,000		80,000
Conversion of foaming line	335,000		335,000
Modification of assembly line	53,000		
Tools for post-production repair equipment (recovery...)	30,000		
Management	10,000		
Contingency	89,300	13,000	41,500
Total ICC	982,300	143,000	456,500
Incremental operating costs			
IOC air-conditioning at US $6.30/kg (threshold)	468,720		
IOC foam at US $0.28/kg	14,341		14,341
Total IOC	483,061		14,341
Total incremental cost	1,465,361	143,000 (plus 1,465,361)	470,841

*conditional on a decision on heat exchangers as presented in document UNEP/OzL.Pro/ExCom/62/55

**based on decision 61/19

Implementation modalities

16. The National Ozone Office is responsible for the overall project coordination and assessment. UNIDO as an implementing agency is responsible for the financial management of the grant, and is to assist Al Hafez in equipment procurement, technical information update, monitoring the progress of implementation, and reporting to the Executive Committee. The Al Hafez Group is responsible to achieve the project objective by providing financial and personnel resources required for the success of the project implementation. The financial management will be administered by UNIDO based on its rules and regulations. Project monitoring will be carried out by UNIDO through regular missions to the project site and continuous communications through means such as e-mails and telephone. The production will be converted before the end of 2012, the project will be completed in early 2013, leading to a project duration of 30 months.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

17. The Secretariat received the submission to the 62nd Meeting and raised a number of questions, relating in particular to the situation of the Syrian Arab Republic in regard to the consumption and phase-out of HCFCs. The budget for this project was already largely agreed prior to the 61st Meeting, and was only not submitted to the Executive Committee because of the open questions related to the situation of the country in regard to HCFC consumption.

Additional justification for the submission of the HCFC phase-out investment project in advance of the HCFC phase-out management plan

18. According to UNIDO, the HPMP preparation is in the process, however it is certain the present project would be of significant importance for the Syrian Arab Republic to achieve compliance with respect to the country's obligation of the freeze in 2013 and the 10 per cent reduction in 2015. The finalisation of the HPMP is foreseen for spring 2011, which would place it in front of the Executive Committee either at the 64th or 65th Meetings. The project duration is comparatively short with production commencing in the alternative technology within 24 months after approval and project completion after 30 months. However, assuming approval at the 62nd Meeting, this will just allow production start-up in time for the beginning of 2013. This timing indicates that a delay would not allow this particular activity to be completed before the first control measure for HCFC would come into effect. A delay of project approval and, with it, an associated delay of project completion would seriously endanger the Syrian Arab Republic's ability to comply with the freeze, since this project will significantly ease the challenges achieving the freeze. Consequently, an approval of the activity at the 62nd Meeting and in advance of the HCFC completion is essential for the country.

Detailed information on the HCFC-141b foam sector

19. The following description of the situation of the country is the result of a number of exchanges between UNIDO and the Secretariat. The consumption of HCFC-141b is related to the production of rigid polyurethane foam for the manufacturing of domestic refrigerators, commercial refrigerators, sandwich foam panels and site panels for insulated truck boxes.

20. UNIDO provided insights regarding the significant increases in HCFC-141b consumption in the last years. According to UNIDO, the foam sector in the Syrian Arab Republic is based on 33 small companies which had an aggregated consumption of 237 mt (26.1 ODP tonnes) in 2008, and with consumption between one and 20 mt. The companies are yet uncertain regarding the alternatives to HCFCs and are presently not in a position to phase out the use of HCFC-141b. The predominant

consumer of HCFC-141b in the country is a system-house, which consumed 80 per cent of the imports of HCFC-141b (2009), i.e. over 500 mt (55.0 ODP tonnes) of HCFC-141b. The consumption associated with this company is the main reason for the sharp increase of HCFC-141b in 2008 and 2009. UNIDO reported that the system-house confirmed in preliminary discussions that all imported quantities of HCFC-141b have been consumed in the country, and that no export has been taking place. The company does not want to phase-out the use of HCFC-141b, and even to discuss any conversion at this stage due to the technical and financial implications as well as the uncertainty about the alternatives currently available in the market.

21. The explanation provided suggests a difficult situation for the country, as its HCFC-141b consumption increased dramatically, possibly based on capacity installed after the cut-off date. This capacity might not be eligible for support from the Multilateral Fund.

Prioritization of the phase-out of HCFC-22

22. UNIDO informed the Secretariat that the national circumstances prevailing in the Syrian Arab Republic is the urgency of the impeding HCFC freeze, while currently, only 20 per cent of the HCFC-141b consumption in the country can be addressed, as the remainder consumption is concentrated by the system-house which is not in position to phase-out HCFCs. The HCFC consumption has been rising rapidly in the last years and is likely to be above the baseline at the end of 2010, i.e. before the baseline is even established. The Government of the Syrian Arab Republic believes it is in a position where it has to use every possibility at its disposal to phase-out significant amounts of HCFC in time to meet the first control measure. On this basis, the phase-out of HCFC-141b and HCFC-22 associated with the Al Hafez project would allow to meet the 2013 control target on time while contributing significantly to achieving compliance with the 2015 control target.

Separate funding requests for HCFC-141b phase-out and combined HCFC-141b with HCFC-22 phase-out

23. UNIDO provided two separate funding requests, one related to the use of HCFC-141b alone and one for a conversion project for both the HCFC-22 and HCFC-141b part of the consumption. In addition, there is the unresolved issue of the eligibility of costs related to the conversion of heat exchanger manufacturing, to be discussed at this meeting. The two proposals are compared in Table 3 below.

Table 3: Comparison of different cost scenarios

Cost item	**Project cost for conversion of HCFC-22 and HCFC-141b**		**Costs for HCFC-141b conversion only (US $)****
	without costs for heat exchanger manufacturing conversion* (US $)	**with costs for heat exchanger manufacturing conversion* (US $)**	
Total ICC (US $)	982,300	1,125,300	456,500
Total IOC (US $)	483,061	0	14,341
Total incremental cost (US $)	1,465,361	1,608,361	470,841
Phase-out associated (mt)	162.4	162.4	71.8
Phase-out associated (ODP tonnes)	12.88	12.88	7.90
Cost-effectiveness (US $/kg)	9.02	9.90	6.56

*conditional on a decision on heat exchangers as presented in document UNEP/OzL.Pro/ExCom/62/55
**based on decision 61/19

24. Due to decision 61/19 on this project and the outstanding decision on funding for heat exchangers described in document UNEP/OzL.Pro/ExCom/62/55, the Executive Committee is presented with three alternative funding requests, ranging from US $470,841 to US $1,608,361. For the purpose of the evaluation sheet, the case of phase-out of both HCFC-141b and HCFC-22 without funding for the conversion of the heat exchangers is shown. The funding originally requested for the implementation of the project is US $1,659,832 plus support costs of US $124,487. UNIDO has informed that the Syrian Arab Republic is consuming 1,280 mt of HCFC-22 and 646 mt of HCFC-141b in this sector.

RECOMMENDATION

25. The Executive Committee may wish:

(a) To consider approving the project proposal for the phase-out of HCFC-22 and HCFC-141b from the manufacture of unitary air-conditioning equipment and rigid polyurethane insulation panels at Al Hafez Group:

(i) At a total cost of US $1,465,361 plus agency support costs of US $109,902 for UNIDO (for the phase-out of HCFC-22 and HCFC-141b); or

(ii) At a total cost of US $1,608,361 plus agency support costs of US $120,627 for UNIDO (for the phase-out of HCFC-22 and HCFC-141b including the conversion of heat exchangers); or

(iii) At a total cost of US $470,841 plus agency support costs of US $35,313 for UNIDO (for the phase-out of HCFC-141b only);

(b) To note that the Government of the Syrian Arab Republic had agreed at the 62nd Meeting to establish as its starting point for sustained aggregate reduction in HCFC consumption the average level of consumption in 2009 and 2010 (estimated at 156 ODP tonnes);

(c) To deduct 12.9 ODP tonnes of HCFCs from the starting point for sustained aggregate reductions in HCFCs; and

(d) To request UNIDO to provide to the Secretariat, at the end of each year of the projects' implementation period, progress reports that address the issues pertaining to the collection of accurate data in line with the objectives of decision 55/43(b), and to include these reports in the implementation reports of the HPMP, once it is approved.

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