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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 PROPOSALS: SAUDI ARABIA

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

Foam

- Phase-out of HCFC-22 and HCFC-142b from manufacture of extruded polystyrene panel at Al-Watania Plastics — Japan/UNIDO
- Phase-out of HCFC-22 and HCFC-142b from manufacture of extruded polystyrene panel at Line No. 2 in Arabian Chemical Company — Japan/UNIDO

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT
SAUDI ARABIA

PROJECT TITLE(S)	BILATERAL/IMPLEMENTING AGENCY
(a) Phase-out of HCFC-22 and HCFC-142b from manufacture of extruded polystyrene panel at Al-Watania Plastics	Japan/UNIDO
(b) Phase-out of HCFC-22 and HCFC-142b from manufacture of extruded polystyrene panel at Line No. 2 in Arabian Chemical Company	Japan/UNIDO

NATIONAL CO-ORDINATING AGENCY	NOU/Presidency for Meteorology and Environment

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2009, AS OF OCTOBER 2010)

HCFCs	1,362.0		

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

Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab Use	Total sector consumption
				Manufacturing	Servicing				
HCFC-123				0.05					0.05
HCFC-141b		319.00		11.00					330.00
HCFC-142b		114.73							114.73
HCFC-22		64.74		357.50	495.00				917.24
HCFC-415b				2.00					2.00

CFC consumption remaining eligible for funding (ODP tonne)	0.0

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US $	Phase-out ODP tonne
	(a)	3,043,283	36

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PROJECT TITLE:	(a)	(b)
ODS use at enterprise (ODP tonne):	20.9	34.0
ODS to be phased out (ODP tonne):	20.9	34.0
Project duration (months):	24	24
Initial amount requested (US $):	2,621,490	1,865,970
Final project costs (US $):		
Incremental Capital Cost:	1,046,200	612,000
Contingency (10 %):	104,620	61,200
Incremental Operating Cost:	62,758	52,123
Total Project Cost:	1,213,578	725,323
Local ownership (%):	100	100
Export component (%):	n/a	n/a
Requested grant (US $):	1,213,578	725,323
Cost-effectiveness (US $/kg):	3.55	1.21
Implementing agency support cost (US $): UNIDO	82,768	46,149
Japan	14,300	14,300
Total cost of project to Multilateral Fund (US $):	1,310,646	758,772
Status of counterpart funding (Y/N):	Y	Y
Project monitoring milestones included (Y/N):	Y	Y
SECRETARIAT'S RECOMMENDATION	For individual consideration	

PROJECT DESCRIPTION

1. On behalf of the Government of Saudi Arabia, UNIDO as the lead implementing agency has submitted to the 62nd Meeting of the Executive Committee the following two project proposals:

(a) Phase-out of HCFC-22 and HCFC-142b from the manufacture of extruded polystyrene (XPS) panel at Al-Watania Plastics at a total cost of US $2,214,490 plus agency support costs of US $166,087 for UNIDO and US $407,000 plus agency support costs of US $52,910 for Japan as originally submitted; and

(b) Phase-out of HCFC-22 and HCFC-142b from the manufacture of extruded polystyrene (XPS) panel at Line #2 in Arabian Chemical Company at a total cost of US $1,458,970 plus agency support costs of US $109,423 for UNIDO and US $407,000 plus agency support costs of US $52,910 for Japan as originally submitted.

2. The HPMP preparation in Saudi Arabia is still in progress and thus the projects have been submitted in accordance with decision 54/39(d).

Conversion projects

3. There are four enterprises manufacturing XPS boards in Saudi Arabia: Al-Watania, ACC, Saptex Co. and Bitutherm. Two enterprises, Saptex and Bitutherm, were established after the cut-off date of 21 September 2007 and thus are not eligible for Multilateral Fund assistance. The Government of Saudi Arabia will introduce a ban on the use of HCFCs for the production of XPS foam in 2013 to ensure the total phase out of the HCFC consumption in the XPS sector by the end 2012.

4. The project proposals are for the conversion of two locally-owned enterprises using HCFC-22 and HCFC-142b as a blowing agent in the manufacture of extruded polystyrene foam panels as shown in Table 1. Following a review of the available alternative technology, the two companies selected iso-butane as the alternative technology.

Table 1. HCFC consumption by Al-Watania and Arabian Chemical Company

HCFC	Al-Watania Plastics	Arabian Chemical	Total consumption
Metric ton			
HCFC-22	137.0	500.0	637.0
HCFC-142b	205.0	100.0	305.0
Total	342.0	600.0	942.0
ODP tonne			-
HCFC-22	7.5	27.5	35.0
HCFC-142b	13.3	6.5	19.8
Total	20.8	34.0	54.8

5. A brief description of the enterprises and their conversion plans is presented below:

(a) Al-Watania Plastics, established in 1980, manufactures processed plastic products such as US $PVC piping. There are two XPS production lines, one installed in 1982 (Berstorff extruder) and another in 2003 (SMS Battenfeld extruder). Introduction of iso-butane technology includes modifications of the extruder including replacement of the screws and barrels (US $814,000), blowing agent supply system (US $283,000), safety instruments and measures (US $380,900 and additional US $250,000 as counterpart contribution), technology transfer, training, and product testing (US $470,000) and 10 per cent for contingencies (US $194,790). Incremental operating costs amount to an additional US $478,800. The cost effectiveness of the project is US $7.66//kg;

(b) Arabian Chemical Company (ACC), established in 1985, is a joint venture (50:50) of DOW and Juffali (a locally-owned company) with three XPS production lines in two factories (two lines in one factory and one in the other). The company manufactures styrofoam and roofmate. Only line 2 of the enterprise, which is locally owned, will be converted to iso-butane technology (LMP extruder installed in 1990). Introduction of iso-butane technology includes modifications of the extruder (US $149,500), blowing agent supply system (US $106,500), safety instruments and measures (US $206,700, and an additional US $250,000 contributed by the enterprise), technology transfer, training, and product testing (US $470,000), and 10 per cent for contingencies (US $93,270). Incremental operating costs amount to an additional US $840,000. The cost effectiveness of the project is US $3.11//kg.

6. The implementation time for both projects is 24 months.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

HCFC consumption

7. The 2006-2009 HCFC consumption reported by the Government of Saudi Arabia under the Montreal Protocol is shown in Table 2.

Table 2. HCFC consumption in Saudi Arabia (Article 7 data)

HCFC	2006	2007	2008	2009
Metric ton				
HCFC-22	10,315.0	13,561.0	17,532.8	16,677.0
HCFC-141b	1,150.0	1,035.0	1,535.0	3,000.0
HCFC-142b	575.0	520.0	647.0	1,765.0
HCFC-123	228.0	165.0	5.0	2.5
Total metric ton	12,268.0	15,281.0	19,719.8	21,444.5
ODP tonne				
HCFC-22	567.3	745.9	964.3	917.2
HCFC-141b	126.5	113.9	168.9	330.0
HCFC-142b	37.4	33.8	42.1	114.7
HCFC-123	4.6	3.3	0.1	0.1
Total ODP tonnes	735.8	896.8	1,175.4	1,362.0

8. Due to the survey conducted for the preparation of the HPMP, complete HCFC consumption data is available for XPS sector (four enterprises); however, insufficient data has been obtained on the polyurethane foam and the commercial refrigeration manufacturing subsectors due to the large number of enterprises involved. Through the survey, it was also found that HCFC-141b is used as a solvent for flushing refrigeration and air conditioning systems. It is expected that full and accurate HCFC consumption data and its sectoral distribution will be known by the end of 2010, in order to finalize the HPMP for submission to the 64th Meeting.

HCFC phase-out strategy

9. Based on licences issued, customs data and average consumption growth, the HCFC consumption in 2010 has been estimated at 1,566.0 ODP tonnes (the 15 per cent increase from 2009 is based on the average increase in consumption over the last few years). Therefore, the HCFC baseline for compliance has been estimated at 1,464.1 ODP tonnes. UNIDO indicated that the Government of Saudi Arabia has

selected the HCFC baseline for compliance as the starting point for aggregate reductions in HCFC consumption.

10. Based on discussions between representatives from the Government of Saudi Arabia and major stakeholders, it was concluded that the most feasible option for meeting the 2013 and 2015 Protocol control targets was to phase out HCFC consumption used in the XPS sector given the significant level of consumption by four enterprises (i.e., 1,177 metric ton (mt) (64.7 ODP tonnes) of HCFC-22 and 1,765 mt (114.7 ODP tonnes) of HCFC-142b, equivalent to 12.3 per cent of the estimated baseline for compliance), and the availability of alternative technologies. Furthermore, as of 1 January 2013, the Government will introduce a decree banning the two XPS foam producers established after 21 September 2007 from producing XPS foam using HCFCs. The projects submitted and the measure to be introduced by the Government will ensure the complete phase out of HCFCs in the XPS foam sector and allow Saudi Arabia to comply with the reduction targets up to 2015. With these measures to address the XPS sector, Saudi Arabia will be able to meet its 2013 and 2015 compliance targets, followed by the 35 per cent reduction in 2020. The remaining HCFC consumption in the polyurethane foam, refrigeration and air-conditioning manufacturing and servicing sectors will be addressed in phase II of the HPMP.

Technical and cost-related issues

11. With reference to the foreign ownership component of Arabian Chemical, UNIDO clarified that only the second production line (Line 2), wholly locally owned, will be converted to the alternative technology. The project for Arabian Chemical will not cover the production capacities owned by the joint venture with DOW, which will be converted based on the results of the conversion of the Line 2 with costs being covered by the joint venture.

12. The Secretariat and UNIDO discussed technical and cost related issues with the projects including: the need to account for the age of the equipment in one of the production lines; the high costs of blowing agent systems and safety related equipment; the request of US $250,000 for each plant as a technology transfer fee; and, the request for incremental operating costs which were calculated applying the threshold of US $1.40/kg (decision 60/44) instead of through a detailed analysis of the costs. All these issues were satisfactorily addressed and the level of funding was agreed as follows: US $1,213,578 for the conversion of the two extruders at the Al-Watani Plastics, including US $62,758 operating costs, with a cost-effectiveness of US $3.55/kg; and, US $725,323 for the conversion of one extruder at Arabian Chemical Company, including US$52,123 operating costs, with a cost-effectiveness of US$1.21/kg. It should also be noted that the remaining consumption of 540 mt (29.7 ODP tonnes) of HCFC-22 and 1,460 mt (94.9 ODP tonnes) of HCFC-142b used in the production of XPS foam by non-eligible enterprises will be phased out through regulatory measures to be introduced by the Government of Saudi Arabia, which will prevent companies established after the cut-off date from manufacturing XPS foam using HCFCs.

Impact on the climate

13. A calculation of the impact on the climate of HCFC consumption through the conversion of the two XPS foam enterprises in Saudi Arabia, based only on the GWP values of the blowing agents and their level of consumption before and after conversion, is as follows: 305.0 mt of HCFC-142b and 637.0 mt of HCFC-22 will be phased out; 353.3 ton of iso-butane will be phased in, and 1,817,379 ton of CO_2-equivalent that would have been emitted into the atmosphere will have been avoided (Table 3). It is to be noted that an additional 4,256,650 ton of CO2-equivalent would not be emitted into the atmosphere through the conversion of the XPS enterprises that are not eligible for funding (with an associated total consumption of 1,460 mt of HCFC-142b and 540 mt of HCFC-22.

Table 3. Calculation of the impact on the climate

Substance	GWP	Metric ton/year	CO2-eq (ton/year)
Before conversion			
HCFC-142b	2,270	305.0	692,350
HCFC-22	1,780	637.0	1,133,860
Total before conversion		942.0	1,826,210
After conversion			
Iso-butane	25	353.3	8,833
Net impact			(1,817,379)

RECOMMENDATIONS

14. The Executive Committee may wish to consider:

(a) Approving the two foam project for the phase-out of HCFC-22 and HCFC-142b from the manufacture of extruded polystyrene foam as follows:

(i) Phase-out of HCFC-22 and HCFC-142b from the manufacture of extruded polystyrene panel at Al-Watania Plastics at a cost of US $1,103,578 plus agency support costs of US $82,768 for UNIDO, and US $110,000 plus agency support costs of US $14,300 for the Government of Japan;

(ii) Phase-out of HCFC-22 and HCFC-142b from the manufacture of extruded polystyrene panel at Line #2 in the Arabian Chemical Company Plastics at a cost of US $615,323 plus agency support costs of US $46,149 for UNIDO, and US $110,000 plus agency support costs of US $14,300 for the Government of Japan;

(b) Noting that the Government of Saudi Arabia agreed at the 62nd Meeting to establish as its starting point for sustained aggregate reductions in HCFC consumption the average level of consumption in 2009 and 2010 (estimated at 1,464.1 ODP tonnes);

(c) Deducting 179.4 ODP tonnes (2,942 metric ton) of HCFCs from the starting point for sustained aggregate reductions in eligible consumption; and,

(d) Requesting UNIDO and the Government of Japan to provide to the Secretariat, at the end of each year of the projects' implementation period, progress reports that addressed the issues pertaining to the collection of accurate data in line with the objectives of decision 55/43(b), and to include those reports in the implementation reports on the HPMP, once it had been approved.