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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
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PROJECT PROPOSALS: JORDAN

This documents includes the comments and recommendations of the Fund Secretariat on the following project proposals:

Foam

- Conversion to CFC-free technology in the manufacture of rigid polyurethane foam (miscellaneous applications) at Fathei Abu Arja World Bank

Refrigeration

- Phasing out CFCa at the Ihsan & Tahseen Baalbaki Co. UNIDO

Sub-sector cost-effectiveness thresholds: Rigid US \$7.83/kg

FAA GROUP PROJECT - Conversion to CFC-free technology in the manufacture of rigid polyurethane foam (miscellaneous applications)

Project Data	Rigid
	FAA Group
ODS phase-out (ODP tonnes)	105.4
Proposed project duration (months)	36
Incremental capital cost (US \$)	410,850
- including contingency (%)	10
Incremental operational cost (US \$)	547,998
Total project cost (US \$)	958,848
Local ownership (%)	
Export component (%)	
Amount requested (US \$) {Original}	825,250
{Revised}	
Cost effectiveness (US \$/kg)	7.83
National Coordinating Agency	General Corporation for Environment Protection Ozone Unit
Implementing Agency	World Bank
Technical review completed?	Yes

<i>Secretariat's Recommendations:</i>	
Amount recommended (US \$)	824,869
Project impact (ODP tonnes)	105.4
Cost effectiveness (US \$/kg)	7.83
Implementing Agency support cost (US \$)	107,233
Total cost to Multilateral Fund (US \$)	932,102

PROJECT DESCRIPTION

Foam Sector Profile

Sector ODS consumption (1991) reported in country programme	118 tonnes ODP
Most recent consumption data (1996)	625 tonnes ODP
ODS to be phased out in approved projects (as at July 1997)	1550 tonnes ODP
ODS reported to have been phased out (as at July 1997)	0
ODS to be phased-out in current proposed projects	105 tonnes ODP
Latest (1995) CFC-11 consumption reported according to Art.7	150 tonnes ODP

FAA GROUP PROJECT - Conversion to CFC-free technology in the manufacture of rigid polyurethane foam (miscellaneous applications)

1. FAA is the sole manufacturer of rigid polyurethane foam systems in the country. In addition, the company purchases and distributes systems used for its own spray foam activities and supplies several small enterprises producing rigid polyurethane foams for miscellaneous applications (spray foam, insulated containers, building insulation, cold storage panels). The main system supplier in Jordan is ICI/Italy.
2. The project is to eliminate CFC-11 consumption in FAA's spray foam activities and all FAA's customers by introducing HCFC-141b based technology as an interim solution, followed by water based systems for those applications where the insulation properties are not that critical (shutters) or can be compensated for (spray foam and construction panels) with total CFC-11 consumption of 61 tonnes.
3. FAA operates three Gusmer foaming dispensers. FAA's customers can be divided in two groups: (i) 10 manufacturers that employ dispensing equipment to produce rigid foam, and (ii) 30 manufacturers that produce rigid hand-mixed foam consuming 14 tonnes CFC-11.
4. FAA is proposing to introduce non-CFC systems with support from its suppliers and technology providers. After completion of the system development and performance of verification trials, FAA will demonstrate these systems in its own spray foam operations. By choosing technology transfer through a local system house, the cost of the project has been reduced by about US \$200,000.
5. The cost of the project is based on retrofit of the dispensing equipment currently available in some enterprises including FAA; and on a compensation for lost capacity to be offered for those enterprises with low pressure equipment as a baseline. These companies consumed 101 tonnes of CFC-11 in their foaming operations. Total capital costs have been estimated at US \$163,350 while incremental operating costs have been estimated at US \$471,766 (NPV for a two-year period).

6. The project also proposes to provide for a small dispenser suitable for 30 hand mix customers who purchase pre-blended systems from FAA but do not use dispensing equipment for their applications. Average CFC-11 consumption by these customers has been estimated at 0.45 tonnes per year. The total capital costs for this conversion have been estimated at US \$98,861 while incremental operating costs have been estimated at US \$76,361 (NPV for a two-year period).

Justification for the Use of HCFCs

7. Most of the applications do not allow the use of pentane, based on the associated safety risks, while other enterprises are not willing to fund safety related investment costs required for the use of this technology. Water based systems are not yet available to match customer requirements, therefore, it was decided to implement HCFC-141b technology as an interim solution. Costs associated with final non-ODS conversion will be borne by the enterprises.

Impact of Project on 1999 Freeze

8. The average CFC consumption for 1995-1997 has been estimated at 630 tonnes while the expected 1999 consumption would be 955 tonnes. Current activities are expected to phase out about 350 tonnes. Consequently, the 1999 consumption will be not less than 600 tonnes. Therefore, it is essential that this project be funded to assist Jordan in meeting its first commitment.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. This umbrella project includes all the remaining enterprises in the rigid foam sub-sector in Jordan.
2. By choosing technology transfer through a local system house, the cost of the project has been reduced by about US \$200,000.
3. The Fund Secretariat and the World Bank discussed issues regarding the level of funding requested for assisting the 30 hand mix customers of FAA to phase out CFCs in their operations. It was agreed that in line with the decision of the Executive Committee regarding funding threshold for terminal umbrella projects, the project costs for the handmix operators would be based on the average consumption of the group. An amount not exceeding 100% of the cost-effectiveness threshold based on this CFC consumption was agreed. This amounted to US \$7,300 per project. The project costs of the group of enterprises with equipment were also adjusted to conform to the same rule. This amounted to US \$438,441.

4. The summary of the project costs is as follows:

FAA	US \$	167,500
Enterprises with equipment		438,441
Enterprises using handmix		218,928
TOTAL		824,869

5. The overall cost-effectiveness of the project is within the sectoral threshold value established by the Executive Committee and none of the beneficiary enterprises has a threshold more than 100 per cent above the established threshold (Decision 19/32).

RECOMMENDATION(S)

1. The Fund Secretariat recommends blanket approval of the project with associated support costs at the funding level shown in the table below:

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
FAA GROUP PROJECT - Conversion to CFC-free technology in the manufacture of rigid polyurethane foam (miscellaneous applications)	824,869	107,233	World Bank

2. The project will complete the CFC phaseout in the rigid foam sub-sector in the country and the Government of Jordan will submit no further requests for funding from the Multilateral Fund for any enterprise in this sector (Decision 19/32).

PROJECT EVALUATION SHEET JORDAN

SECTOR: REFRIGERATION ODS use in sector (1993): 150 ODP tonnes

Sub-sector cost-effectiveness thresholds: Commercial 15.21 US \$/kg

Project Title:

Phasing out CFC at the Ihsan & Tahseen Baalbaki Co.

Project Data	Commercial refrigeration
	Ihsan & Tahseen Baalbaki
ODS phase-out (ODP tonnes)	66.48
Proposed project duration (months)	24
Incremental capital cost (US \$)	184,250
- including contingency (%)	10
Incremental operational cost (US \$)	360,853
Total project cost (US \$)	545,103
Local ownership (%)	100
Export component (%)	
Amount requested (US \$) {Original}	807,158
{Revised}	545,103
Cost effectiveness (US \$/kg)	8.24
National Coordinating Agency	Ministry of Municipal, Rural Affairs & Environment
Implementing Agency	UNIDO
Technical review completed?	Yes

Secretariat's Recommendations:	
Amount recommended (US \$)	545,103
Project impact (ODP tonnes)	66.48
Cost effectiveness (US \$/kg)	8.24
Implementing Agency support cost (US \$)	70,863
Total cost to Multilateral Fund (US \$)	615,966

PROJECT DESCRIPTION

Phasing out CFC at the Ihsan & Tahseen Baalbaki Co.

1. Ihsan and Tahseen Baalbaki has a 70% market share in Jordan; they manufacture display cases, cabinets, coldrooms, chest freezers, water coolers, etc. and sandwich panels. Implementation of this project would result in the phase out of 66.48 ODP tonnes.
2. The replacement technologies are HFC-134a in the refrigeration system and HCFC-141b in the insulating foam system.
3. For conversion to HFC-134a, new charging and evacuation equipment, charging boards, leak detectors, vacuum pumps, and other components are requested.
4. UNIDO stated that 'this project will be finalized by end 1999 and thus will contribute to the freeze target of the country.'
5. The conversion to HCFC-141b requires little modification to the current low-pressure foaming machines. Electric heaters are required for the existing jigs. Product design will be modified.
6. Justification for HCFC-141b technology: This technology is regarded as a transitional solution. Cyclopentane use for blowing is less widespread in commercial equipment. Cyclopentane would be a suitable foaming agent were it not for its acute flammability. The use of this substance would require the replacement of all of the low-pressure equipment. Rigorous safety training would be required. Since the factory is situated in a populated area the local authorities are reluctant to issue license for storage and application of cyclopentane.
7. Incremental operating costs are requested for both refrigeration and foam systems to cover additional costs of the new refrigerant, new compressors (ranging from US \$3 to US \$50 per compressor), new evaporator and dryer, and new foam formulation.
8. All of the equipment replaced during the conversion process through the project will be dismantled by the enterprise and rendered unusable for use with CFC (charging board and leak detectors).

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

1. This enterprise produces a variety of refrigeration systems, some of which use two compressors/unit. The incremental operating costs of some of the compressors are as high as US \$50. Incremental operating costs of dryers and evaporators for these compressors are high.
2. The Secretariat and UNIDO agreed that 6720 units should be treated as domestic refrigeration and 2074 as commercial. Incremental operating cost was adjusted accordingly.
3. Cost of chemicals were adjusted to reflect prices in the region.
4. Cost of test engineering and of HFC-134a expert's was subsumed under development cost.
5. The project was adjusted accordingly.

RECOMMENDATION

1. The Fund Secretariat recommends blanket approval of the project with associated support costs at the funding level indicated in the table below:

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
Phasing out CFC at the Ihsan & Tahseen Baalbaki Co.	545,103	70,863	UNIDO