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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-third Meeting
Montreal, 12-14 November 1997

PROJECT PROPOSALS: TUNISIA

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

Aerosol

- Phasing out CFCs at Parhycos, Sfax, Tunisia UNIDO

Foam

- Phasing out CFC-11 at Sotrapoc flexible polyurethane foam plant UNIDO
- Phasing out CFC-11 at Sud Inter Mousse flexible polyurethane foam plant UNIDO
- Phasing out CFC-11 at Polymousse flexible polyurethane foam plant UNIDO

Refrigeration

- Terminal umbrella project to phase out ODS at 7 manufacturers of commercial and domestic refrigerators UNIDO

PROJECT EVALUATION SHEET **TUNISIA**

SECTOR: AEROSOL ODS use in sector (1996): 222 ODP tonnes

Sub-sector cost-effectiveness thresholds: Aerosol US \$4.4/kg

Project Title: Phasing out CFCs at PARHYCOS

Project Data	AEROSOL
	PARHYCOS
ODS phase-out (ODP tonnes)	10
Proposed project duration (months)	14
Incremental capital cost (US \$)	46,850
- including contingency (%)	10
Incremental operational cost (US \$)	(5,655)
Total project cost (US \$)	41,195
Local ownership (%)	100
Export component (%)	
Amount requested (US \$) {Original}	41,195
{Revised}	
Cost effectiveness (US \$/kg)	4.12
National Coordinating Agency	National Agency for the Protection of the Environment
Implementing Agency	UNIDO
Technical review completed?	Yes

<i>Secretariat's Recommendations:</i>	
Amount recommended (US \$)	41,195
Project impact (ODP tonnes)	10
Cost effectiveness (US \$/kg)	4.12
Implementing Agency support cost (US \$)	5,355
Total cost to Multilateral Fund (US \$)	46,550

PROJECT DESCRIPTION

1. In 1996, the total consumption of CFCs in the aerosol sector in Tunisia amounted to 222 tonnes. At its 19th and 22nd Meetings the Executive Committee approved five projects for the phase out of 213.4 tonnes of CFCs used in the manufacturing of aerosol products, equivalent to 96.13% of the total CFC consumption in the aerosol sector.
2. The Government of Tunisia is submitting an additional project in the aerosol sector which would lead to elimination of the remaining 10 tonnes of CFCs used in the country. The Government of Tunisia decided to accelerate the process of phasing out the use of CFCs from the industry and aims to have all the ODS eliminated by the year 2000.
3. The project under consideration is for the replacement of CFC-12 with carbon dioxide propellant used in manufacturing deodorants (110,000 cans/year) and hair sprays (110,000 cans/year). The present aerosol filling line consists of two semi-automatic filling machines, one for product filling and the other for crimping and propellant gassing.
4. The enterprises will convert to carbon dioxide technology. Conversion entails installation of a propellant filling machine with an impact filler and an agitation system with accessories and a carbon dioxide storage and distribution system.
5. Technical assistance will be provided for performance and supervision of engineering designs, equipment installation and commissioning of the plant. Training in production and quality control procedures will also be provided.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The company was made aware that the entire sector in Tunisia has converted to HAP technology and, also, in case of an eventual failure in the use of carbon dioxide propellant, costs of changing to other non-ODS technology will not be covered by the Multilateral Fund.
2. The capital costs of conversion are US \$46,850 and the operational savings (NPV) for four years are US \$5,655.
3. The enterprises will finance costs associated with modifications of the plant layout, installation of the carbon dioxide filling machines and water tank, pump house and fence (US \$62,000). The Fund Secretariat has not reviewed these costs, some of which would not be eligible.

RECOMMENDATION

1. The Fund Secretariat recommends blanket approval of the project at the funding level indicated below:

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
(a) Phasing out CFCs at Parhycos	41,195	5,355	UNIDO

SECTOR:	FOAM ODS use in sector (1994):	222 ODP tonnes
Sub-sector cost-effectiveness thresholds:	Flexible	US \$6.23/kg

- Phasing-out CFC-11 at SUD INTER MOUSSE flexible polyurethane Foam plant
- Phasing-out CFC-11 at POLYMOUSSE flexible polyurethane Foam plant
- Phasing-out CFC-11 at SOTRAPOC flexible polyurethane Foam plant

Project Data	Flexible		
	SUD INTER	POLYMOUSSE	SOTRAPOC
ODS phase-out (ODP tonnes)	102	35	20
Proposed project duration (months)	12	12	12
Incremental capital cost (US \$)	511,500	115,200	93,200
- including contingency (%)	10	10	10
Incremental operational cost (US \$)	110,000	(10,857)	(3,163)
Total project cost (US \$)	621,500	104,343	90,037
Local ownership (%)	100	100	100
Export component (%)			
Amount requested (US \$) {Original}	621,500	104,343	90,037
{Revised}			
Cost effectiveness (US \$/kg)	6.09	2.98	4.50
National Coordinating Agency	Agence Nationale pour la Protection de l'Environnement		
Implementing Agency	UNIDO		
Technical review completed?	Yes	Yes	Yes

Amount recommended (US \$)	Pending	104,343	90,037
Project impact (ODP tonnes)		35	20
Cost effectiveness (US \$/kg)		2.98	4.50
Implementing Agency support cost (US \$)		13,565	11,705
Total cost to Multilateral Fund (US \$)		117,908	101,742

PROJECT DESCRIPTION

Foam Sector Profile

Sector ODS consumption (1994) reported in country programme	222 tonnes ODP
Most recent consumption data	not available
ODS to be phased out in approved projects (as at July 1997)	903 tonnes ODP
ODS reported to be phased out in approved projects (as at July 1997)	0
ODS to be phased-out in current proposed projects	157 tonnes ODP
Latest (1995) CFC-11 consumption reported according to Art.7	354 tonnes ODP

(a) Phasing-out CFC-11 at Sud Inter Mousse flexible polyurethane Foam plant

1. Sud Inter Mousse will convert from the use of CFC-11 in the manufacture of flexible slabstock foam used for the production of foam filled mattresses and furniture to liquid carbon dioxide (LCD) technology. The enterprise operates a Laader BERG LTD type EC-6 machine.
2. The capital cost of conversion involves modification of existing facilities and installation of supplementary equipment and instruments (US \$465,000), trials, technology transfer and training (US \$100,000). Incremental operating costs and savings are to be determined following completion of the guidelines on LCD projects.

(b) Phasing-out CFC-11 at Polymousse flexible polyurethane Foam plant

(c) Phasing-out CFC-11 at Sotrapoc flexible polyurethane Foam plant

1. The two companies will convert from the use of CFC-11 in the manufacture of flexible foam for mattresses and furniture applications, to methylene chloride technology.
2. Polymousse operates a flat top foam machine purchased from Laader Berg (model EC-6 150) in 1995. Sotrapoc started its foam production in 1985 with a discontinuous production unit purchased from SPUHL, Switzerland.
3. For each enterprise, the capital cost of conversion includes one methylene chloride metering pump system (US \$15,000), one process ventilation system (US \$50,000), one extra ventilation system in cure area (US \$12,000), safety devices (US \$5,000), trials, technology transfer and training (US \$15,000), commissioning and start-up (US \$10,000). Incremental operating benefits at the level indicated in the cover sheet are to be expected since methylene chloride is cheaper than CFC-11 and is used in a lower ratio compared with CFC-11.

Equipment or Components to be Destroyed or Rendered Unusable

4. The project proposals listed the equipment to be replaced or rebuilt.

Impact of Project on 1999 Freeze

5. Implementation of the three project proposals will lead to elimination of 157 tonnes of CFC, equivalent to 70.7 per cent of the total CFC consumption in the sector. Assuming that the projects will be implemented before the end of 1999, these projects will contribute towards achieving the 1999 freeze obligation of the country.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS**COMMENTS****(a) Phasing-out CFC-11 at Sud Inter Mousse flexible polyurethane Foam plant**

1. The Executive Committee at its Twenty-second Meeting requested the Fund Secretariat and the Implementing Agencies to finalize their discussions on the guidelines for LCD projects and present their recommendations to the Committee alongside the projects which may be submitted to the Twenty-third Meeting for approval. As at 20 October 1997 there were still ongoing discussions among the Implementing Agencies and the Fund Secretariat with the view to finalizing the recommendations.

2. The final project costs of this and the other LCD projects will be communicated to the Sub-Committee on Project Review should agreement be reached on the guidelines.

(b) Phasing-out CFC-11 at Polymousse flexible polyurethane Foam plant**(c) Phasing-out CFC-11 at Sotrapoc flexible polyurethane Foam plant**

1. These two projects were discussed between the Fund Secretariat and UNIDO and costs agreed as indicated in the project evaluation sheet.

RECOMMENDATION

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

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
(a) Phasing-out CFC-11 at SUD INTER MOUSSE flexible polyurethane Foam plant	Pending		UNIDO
(b) Phasing-out CFC-11 at POLYMOUSSE flexible polyurethane Foam plant	104,343	13,565	UNIDO
(c) Phasing-out CFC-11 at SOTRAPOC flexible polyurethane Foam plant	90,037	11,705	UNIDO

PROJECT EVALUATION SHEET **TUNISIA**

SECTOR: REFRIGERATION ODS use in sector (1993): 29.0 ODP tonnes

Sub-sector cost-effectiveness thresholds: Commercial 15.21 US \$/kg
Domestic 13.76 US \$/kg

Project Title:

Terminal umbrella projects to phase out ODS at seven manufacturers of commercial and domestic refrigerators (Chahed Refrigeration, Sogima, Sotiem, Rei, Frigo BAF, Societe Moderne Refrigeration, Frigo Technique)

Project Data	Domestic & Commercial Refrigeration
	Terminal Umbrella
ODS phase-out (ODP tonnes)	29.0
Proposed project duration (months)	18
Incremental capital cost (US \$)	236,199
- including contingency (%)	10
Incremental operational cost (US \$)	137,912
Total project cost (US \$)	374,111
Local ownership (%)	100
Export component (%)	0
Amount requested (US \$) {Original}	435,152
{Revised}	374,111
Cost effectiveness (US \$/kg)	12.90
National Coordinating Agency	Agence nationale de la Protection de l'Environnement
Implementing Agency	UNIDO
Technical review completed?	Yes

Secretariat's Recommendations:	
Amount recommended (US \$)	374,111
Project impact (ODP tonnes)	29
Cost effectiveness (US \$/kg)	12.9
Implementing Agency support cost (US \$)	48,634
Total cost to Multilateral Fund (US \$)	422,745

PROJECT DESCRIPTION

Terminal umbrella projects to phase out ODS at seven manufacturers of commercial and domestic refrigerators (Chahed Refrigeration, Sogima, Sotiem, Rei, Frigo BAF, Societe Moderne Refrigeration, Frigo Technique)

1. This project will phase out the use of CFC-12 in the production of commercial refrigerated cabinets at 7 manufacturers in Tunisia. Implementation of this project will complete the phase out of CFCs in the entire domestic and commercial refrigeration sector. The combined CFC consumption of the seven enterprises is 29 ODP tonnes.
2. CFC-11 which is used as a foam blowing agent in the production of polyurethane foam at 2 companies will be replaced by HCFC-141b and CFC-12 which is used as the refrigerant in the cooling circuit of appliance will be replaced by HFC-134a. The project includes the provision of equipment to convert the production facilities and technical assistance and training in the use of handling of HFC-134a; the conversion cost of the existing blowing technique to HCFC-141b will be absorbed by the companies.
3. Replacement equipment, consisting of charging boards, leak detectors and vacuum pumps suitable for HFC-134a use are requested, as well as one set each of basic package of laboratory test equipment.
4. Incremental operating costs are requested for two years for 6 of the enterprises (commercial refrigeration) and for 6 months for one enterprise (domestic refrigeration). These costs consist of additional costs of chemicals, and compressors.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

1. Some of the cost items were slightly modified to reflect prevalent prices of chemicals.
2. The overall cost effectiveness of the umbrella project is within the threshold for the subsector, and that of the individual projects does not exceed the threshold for the sub-sector by more than 100%.
3. The HCF-141b technology is regarded as a transitional solution. Hydrocarbon technology could have been selected, but the considerable safety implications associated with this choice would have been beyond the scope of the small production facilities involved. The replacement of low-pressure foaming machines with high-pressure units for the use of hydrocarbon agents would have made the project prohibitively expensive. The investment cost for the proposed solution is only just funding level prescribed by the acceptable cost effectiveness ratio.

RECOMMENDATION

1. The Fund Secretariat recommends blanket approval for this project at the funding level listed below.

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
Terminal umbrella projects to phase out ODS at seven manufacturers of commercial and domestic refrigerators (Chahed Refrigeration, Sogima, Sotiem, Rei, Frigo BAF, Societe Moderne Refrigeration, Frigo Technique)	374,111	48,634	UNIDO