



United Nations
Environment
Programme



Distr.
Limited

UNEP/OzL.Pro/ExCom/29/42
30 October 1999

ORIGINAL: ENGLISH

EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-ninth Meeting
Beijing, 24-26 November 1999

PROJECT PROPOSALS: MOROCCO

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

Refrigeration

- Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Mafidec UNIDO
- Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Siafmo UNIDO
- Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration at Sonyafroid UNIDO
- Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of domestic commercial refrigeration equipment at Comafro UNIDO
- Conversion to HCFC-141b technology (rigid foam) and HFC-134a (refrigeration) in the manufacture of domestic refrigerators and freezers at Manar UNIDO

PROJECT EVALUATION SHEET MOROCCO

SECTOR: Refrigeration ODS use in sector (1997): 251 ODP tonnes

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

Project Titles:

- (a) Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Mafidec
- (b) Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Siafmo
- (c) Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration at Sonyafroid
- (d) Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of domestic commercial refrigeration equipment at Comafro
- (e) Conversion to HCFC-141b technology (rigid foam) and HFC-134a (refrigeration) in the manufacture of domestic refrigerators and freezers at Manar

Project Data	Commercial	Commercial	Commercial	Domestic/ Commercial	Domestic
	Mafidec	Siafmo	Sonyafrroid	Comafro	Manar
Enterprise consumption (ODP tonnes)	11.50	8.80	20.60	11.20	41.00
Project impact (ODP tonnes)	5.55	8.70	13.08	6.52	38.60
Project duration (months)	18	18	18	18	8
Initial amount requested (US \$)	131,783	100,149	258,595	148,302	470,533
Final project cost (US \$):					
Incremental capital cost (a)	72,000	56,200	167,000	112,500	301,433
Contingency cost (b)	6,200	4,620	15,700	10,250	
Incremental operating cost (c)	39,160	65,420	93,195	12,000	132,750
Total project cost (a+b+c)	117,360	126,240	275,895	134,750	434,183
Local ownership (%)	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%
Amount requested (US \$)	117,360	126,240	275,895	134,750	434,183
Cost effectiveness (US \$/kg.)	11.87	14.51	14.62	13.82	11.25
Counterpart funding confirmed?					
National coordinating agency	Ministere de l'Industrie du Commerce et de l'Artisanat				
Implementing agency	UNIDO	UNIDO	UNIDO	UNIDO	UNIDO

Secretariat's Recommendations					
Amount recommended (US \$)	117,360	126,240	275,895	134,750	
Project impact (ODP tonnes)	5.55	8.70	13.08	6.52	
Cost effectiveness (US \$/kg)	11.87	14.51	14.62	13.82	
Implementing agency support cost (US \$)	15,257	16,411	35,866	17,518	
Total cost to Multilateral Fund (US \$)	132,617	142,651	311,761	152,268	

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1997)	886.0	ODP tonnes
- Baseline consumption* of Annex A Group I substances (CFCs)	802.3	ODP tonnes
- 1998 consumption of Annex A Group I substances	Not available	
- Baseline consumption of CFCs in refrigeration sector	244.33	ODP tonnes
- 1997 consumption of CFCs in refrigeration sector	251.0	ODP tonnes
- Funds approved for investment projects in refrigeration sector as of July 1999	US \$ 550,636	
- Quantity of CFC to be phased out in refrigeration sector as of July 1999 (28 th Meeting)	39.1	ODP tonnes

*Baseline consumption of Annex A controlled substances refers to average of the consumption for the years 1995-1997 inclusive.

1. The refrigeration manufacturing sector in Morocco is comprised of three manufacturers of domestic refrigeration appliances and a number of small and medium sized commercial refrigeration enterprises. The Executive Committee approved three projects for small commercial refrigeration enterprises to phase out 17.1 ODP tonnes. In regard to repairs and servicing, a refrigerant recovery and recycling project was approved by the Executive Committee at its 23rd Meeting to phase out 22.0 ODP tonnes.

2. Comafro, Mafidec, Siafmo and Sonyafroid are small and medium sized commercial refrigeration enterprises. In 1998, these four companies consumed a total of 22.3 ODP tonnes of CFC-11 and 29.8 ODP tonnes of CFC-12 in the production of commercial refrigeration equipment such as commercial refrigerators, freezers and display cabinets. These companies are also involved in the manufacture of foam sandwich insulation panels, and installation, assembling and charging of refrigeration systems in cold stores and refrigerated trucks. The four enterprises will convert their foam operations from CFC-11 to HCFC-141b as the blowing agent (as the interim technology, with a later conversion to an ODS-free technology) and refrigerant operations from CFC-12 to HFC-134a resulting in a total phase out of 33.85 ODP tonnes. Two enterprises (Comafro and Sonyafroid) each possess two low pressure foam machines. The other two enterprises (Mafidec and Siafmo) are using ready-made polystyrene insulation panels. No foaming machines are available in these enterprises, however, blended chemicals and hand-mix equipment are used to occasionally produce foam for cabinets and doors. All four enterprises are using refrigerant charging equipment, leak detectors and vacuum pumps for their refrigerant operations. The project will include incremental capital costs covering replacement of two low pressure foam dispensers with high pressure dispensers, replacement of refrigerant charging units and leak detectors, replacement/retrofit of vacuum pumps, re-design, testing, trials, technical assistance and training. Incremental operating costs are sought for the higher cost of chemicals including an increase in density, and for HFC-134a compressors.

3. Manar is the main producer of domestic refrigerators and freezers in Morocco. In 1996, Manar converted its CFC-11-based foam operations to HCFC-141b foam blowing agent as an interim solution and CFC-12 was replaced HFC-134a in the refrigeration system. It resulted in the phase out of the use of 29 ODP tonnes of CFC-11 and 12 ODP tonnes of CFC-12 per year for all models produced. This project claims the incremental costs of conversion on a retroactive basis.

4. The enterprise replaced a low pressure foaming machine of 1980 vintage with a new high pressure dispenser. The refrigerant charging equipment and leak detectors were replaced with the equipment suitable for HFC-134a refrigerant and retrofitted. Vacuum pumps were retrofitted. The project includes the cost of re-design, testing, trials, technical assistance and training. The impact of the project is the phase out of 38.6 ODP tonnes annually. Incremental operating costs are sought for the higher cost of chemicals and for HFC-134a compressors for the period of six months.

Justification for the Use of HCFC-141b

5. The enterprises have selected HCFC-141b technology to replace CFC-11 in foam blowing operations. A letter advising of the Government decision to use HCFC technology has been received by the Secretariat in accordance with Executive Committee decision 27/13 and is attached to this evaluation together with the justification and undertakings from the enterprises.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat discussed with UNIDO the implications for the projects (a – d above) of the new sub-sector on the assembly, installation and charging of refrigeration systems. Because the refrigeration systems for cold stores and refrigerated trucks are installed by Comafro, Mafidec and Sonyafroid on-site, no incremental operating costs have been included in the cold store component. The cost-effectiveness of conversion of sandwich panel production at Comafro, Mafidec and Sonyafroid has been calculated using the cost-effectiveness threshold established for the rigid foam sector. The Secretariat has also discussed the justification for increase in foam density. The required density has been adjusted according to industry norms. The Secretariat has discussed also the provision and the cost of equivalent charging, evacuation and leak detection equipment. The revised project proposals reflect the above.

2. The Secretariat has also discussed with UNIDO incremental capital cost of the Manar project. A low pressure foaming machine was purchased and installed in 1980. Replacement of equipment of 19 years old represents unavoidable technological upgrade which should be taken into account in calculation of eligible capital incremental costs in accordance with Decision 26/37. The incremental cost of the replacement of the foaming machine has been adjusted accordingly.

3. The requested 13% support cost needs to be justified since the project is retroactive. Information on UNIDO involvement in the implementation of this project has been requested by

the Secretariat in accordance with Decision 28/49 to justify the claimed support cost. Information has not been provided by UNIDO. The proposal is brought for individual consideration by the Sub-Committee for Project Review.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the Mafidec, Siafmo, Sonyafroid and Comafro projects with the funding levels and associated support costs as indicated below.

	Project Title	Project Funding (US\$)	Support Cost (US\$)	Implementing Agency
(a)	Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Mafidec	117,360	15,257	UNIDO
(b)	Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Siafmo	126,240	16,411	UNIDO
(c)	Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration at Sonyafroid	275,895	35,866	UNIDO
(d)	Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of domestic commercial refrigeration equipment at Comafro	134,750	17,518	UNIDO