UNITED NATIONS

EP

United Nations Environment Programme

Distr.
Limited

UNEP/OzL.Pro/ExCom/29/37
29 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: IRAN

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

Fumigant

• Phasing out of the important non critical, non essential use of methyl bromide for post-harvest treatment	UNIDO

Refrigeration

• Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment and rigid polyurethane foam at Electro Sard Azna Co,.	UNDP
• Conversion from CFC-11 tgo HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Electro Shargh Mazandaran Co.	UNDP
• Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Khozestan Technique Co.	UNDP
• Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Sardkaran Industrial Manufacturing Co.	UNDP
• Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration	UNIDO

at the Sherkate Sanaayee Toulidy Bard Co.	
• Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Forouzan Yakhchal Company (Forouzan Ref. Co.)	UNIDO
• Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Minavand Refrigeration Company	UNIDO
• Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Saiwan Sannat Co.	UNIDO

PROJECT EVALUATION SHEET
IRAN

SECTOR: Fumigant ODS use in sector (199): ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Titles:

(a) Phasing out of the important non critical, non essential use of methyl bromide for post-harvest treatment

Project Data	**Methyl bromide**
Enterprise consumption (ODP tonnes)	12.40
Project impact (ODP tonnes)	12.40
Project duration (months)	24
Initial amount requested (US $)	487,169
Final project cost (US $):	
Incremental capital cost (a)	270,500
Contingency cost (b)	27,050
Incremental operating cost (c)	-36,852
Total project cost (a+b+c)	260,698
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US $)	260,698
Cost effectiveness (US $/kg.)	21.02
Counterpart funding confirmed?	
National coordinating agency	Department of the Environment
Implementing agency	UNIDO

Secretariat's Recommendations	
Amount recommended (US $)	260,698
Project impact (ODP tonnes)	12.40
Cost effectiveness (US $/kg)	21.02
Implementing agency support cost (US $)	33,891
Total cost to Multilateral Fund (US $)	294,589

PROJECT DESCRIPTION

Phasing out the important, non-critical, non essential use of methyl bromide for post-harvest treatment

1. About 9 ODP tonnes of methyl bromide (MB) is used in Iran for the fumigation of dried fruits (mainly dates) and vegetables. Additionally, 5.5 ODP tonnes of MB are used for fumigation of seeds, grains, spices and nuts including pistachios. Phosphine is already used as an alternative in this area; however, Iranian fumigators lack the necessary knowledge and equipment to phase out the remaining MB use.

2. Dates are fumigated up to three times during the storage process: upon receipt of the crop, after pitting and after packing. About 95 per cent of dried fruit fumigation takes place under plastic sheets, and 5 per cent in vacuum chambers with a capacity between 15 and 70 m^3. Fumigation period is 24 hours under plastic and 3 hours in vacuum chambers.

3. The project is to phase out all major non-critical, non-essential uses of MB in post-harvest treatment, including the fumigation of dried fruits and vegetables, nuts, grains and seeds, through the use of phosphine (in solid and liquid states). It includes procurement of 100 phosphine detectors for monitoring fumigation space (US $150 each) and 100 phosphine detectors for monitoring the surrounding work space (US $120 each), 50 self-contained breathing apparatus (US $1,600 each), international expertise and two 5-day training programmes (US $73,800).

4. Operating costs (US $1,189) were calculated on the basis of the difference in costs between MB and phosphine (both liquid and solid).

5. The project will be implemented by UNIDO in cooperation with PPO. Contracts for implementation of the major project component will be awarded on the basis of competitive bids.

6. The use of MB for commodity fumigation has already been regulated by the Government. Only licensed professionals and official commodity storage specialists within PPO can apply MB in post-harvest treatments. Upon completion of the project, the Government will issue a regulation banning the use of MB in non-essential, non-critical stored commodity treatment of dried fruits, dried vegetables, nuts, grains and seeds, and will prohibit it for new applications in non-essential, non-critical treatment for stored commodities. The Government also agrees to counter the illegal import and use of MB in the country.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat discussed with UNIDO issues regarding the number of phosphine detectors requested which correspond to the same number of fumigation companies in the country, and the use of self contained breathing apparatus (50 units). UNIDO informed the Secretariat that of the total fumigation companies in the country, 76 provided fumigation services

regularly using MB. Consequently, UNIDO adjusted the number of items requested. It was also agreed to withdraw the request for the self contained breathing apparatus since they should have been part of the baseline equipment of the fumigation companies.

2. UNIDO and the Secretariat also discussed the use of liquid phosphine (instead of solid phosphine) since the technical reviewer of the project indicated that it is more complicated than using solid phosphine and thus its use in the short term could disappear. UNIDO agreed to remove the request for liquid phosphine dispensing equipment (US $18,000) and adjusted the calculation of operating costs/savings of the project.

3. UNIDO also informed the Secretariat that the training programme is divided into two parts: (i) organization of a workshop for the trainers with the active participation of an international consultant; and (ii) implementing workshops for fumigation companies. The technical follow-up refers to the continuous monitoring of the training programme. The size of the training programme was adjusted according to the reduced number of fumigation companies included in the project.

RECOMMENDATION

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 Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	Phasing out of the important non critical, non essential use of methyl bromide for post-harvest treatment	260,698	33,891	UNIDO

PROJECT EVALUATION SHEET
IRAN

SECTOR: Refrigeration ODS use in sector (1997): 3,250 ODP tonnes

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

Project Titles:

(a) Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment and rigid polyurethane foam at Electro Sard Azna Co,.
(b) Conversion from CFC-11 tgo HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Electro Shargh Mazandaran Co.
(c) Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Khozestan Technique Co.
(d) Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Sardkaran Industrial Manufacturing Co.

Project Data	**Commercial**	**Commercial**	**Commercial**	**Commercial**
	Electro Sard	**Electro Shargh**	**Khozestan**	**Sardkaran**
Enterprise consumption (ODP tonnes)	20.20	30.32	10.25	25.76
Project impact (ODP tonnes)	18.68	28.24	9.60	25.27
Project duration (months)	36	36	36	36
Initial amount requested (US $)	231,215	346,714	145,955	356,888
Final project cost (US $):				
Incremental capital cost (a)	160,600	263,500	129,990	81,500
Contingency cost (b)	16,060	26,350	12,990	8,150
Incremental operating cost (c)	29,180	43,134	31,200	65,755
Total project cost (a+b+c)	205,840	332,984	174,180	155,405
Local ownership (%)	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%
Amount requested (US $)	191,061	301,715	132,041	155,405
Cost effectiveness (US $/kg.)	10.23	10.68	13.76	6.15
Counterpart funding confirmed?	Yes	Yes	Yes	
National coordinating agency	Department of Environment	Department of Environment	Department of Environment	Department of Environment
Implementing agency	UNDP	UNDP	UNDP	UNDP

Secretariat's Recommendations				
Amount recommended (US $)	191,061	301,715	132,041	155,405
Project impact (ODP tonnes)	18.68	28.24	9.60	25.27
Cost effectiveness (US $/kg)	10.23	10.68	13.76	6.15
Implementing agency support cost (US $)	24,838	39,223	17,165	20,203
Total cost to Multilateral Fund (US $)	215,899	340,938	149,206	175,608

PROJECT EVALUATION SHEET
IRAN

SECTOR: Refrigeration ODS use in sector (1997): 3,250 ODP tonnes

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

Project Titles:

(e) Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Sherkate Sanaayee Toulidy Bard Co.
(f) Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Forouzan Yakhchal Company (Forouzan Ref. Co.)
(g) Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Minavand Refrigeration Company
(h) Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Saiwan Sannat Co.

Project Data	**Commercial**	**Commercial**	**Commercial**	**Commercial**
	Bard	**Forouzan**	**Minavand**	**Saiwan**
Enterprise consumption (ODP tonnes)	19.80	20.50	18.00	19.00
Project impact (ODP tonnes)	16.35	16.71	13.45	14.89
Project duration (months)	24	24	24	24
Initial amount requested (US $)	215,944	227,878	193,078	210,930
Final project cost (US $):				
Incremental capital cost (a)	175,000	153,000	149,500	176,500
Contingency cost (b)	16,500	11,600	13,450	11,305
Incremental operating cost (c)	14,029	28,104	13,827	12,904
Total project cost (a+b+c)	205,529	192,704	176,777	200,709
Local ownership (%)	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%
Amount requested (US $)	205,529	192,704	176,777	200,709
Cost effectiveness (US $/kg.)	12.56	11.53	13.13	13.47
Counterpart funding confirmed?				
National coordinating agency	Department of Environment	Department of Environment	Department of Environment	Department of Environment
Implementing agency	UNIDO	UNIDO	UNIDO	UNIDO

Secretariat's Recommendations				
Amount recommended (US $)	205,529	192,704	176,777	200,709
Project impact (ODP tonnes)	16.35	16.71	13.45	14.89
Cost effectiveness (US $/kg)	12.56	11.53	13.13	13.47
Implementing agency support cost (US $)	26,719	25,052	22,981	26,092
Total cost to Multilateral Fund (US $)	232,248	217,756	199,758	226,801

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1998)		8,938.4	ODP tonnes
- Baseline consumption* of Annex A Group I substances (CFCs)		4,635.0	ODP tonnes
- 1998 consumption of Annex A Group I substances		5,571.0	ODP tonnes
- Baseline consumption of CFCs in refrigeration sector		Not available	
- 1998 consumption of CFCs in refrigeration sector		Not available	
- 1997 consumption of CFCs in refrigeration sector		3,250.0	ODP tonnes
- Funds approved for investment projects in refrigeration sector as of July 1999	US $	18,345,360	
- Quantity of CFC to be phased out in refrigeration sector as of July 1999 (28th Meeting)		1,735	ODP tonnes

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

1. The refrigeration sector is estimated to have about 300 enterprises. In the domestic refrigeration sub-sector, there are about 10 large manufacturers, and about 15 medium-sized manufacturers. The Executive Committee at its 11th and 16th Meetings approved the first group of 5 domestic refrigeration companies manufacturing 715,000 units. The second group of 6 domestic refrigeration companies with total production of 321,750 units was approved at the 18th Meeting. In the commercial refrigeration sub-sector, there are about 30 large-sized manufacturers, and about 250 small and medium-sized manufacturers. The Executive Committee has approved 13 projects in the commercial refrigeration sub-sector. These enterprises produce 1.8 million commercial refrigeration units a year, using over 1 million hermetic compressors equal to or below 250 wt in their production.

2. Two companies produce compressor in Iran: Iran Compressor Manufacturing Co. (ICMC) and Pars with total production capacity about 2.3 million units per year. The Executive Committee approved a project for conversion of ICMC at US $1,076,148 at its 28th Meeting.

Project description

3. UNDP and UNIDO have submitted projects for conversion of eight small and medium sized domestic/commercial refrigeration enterprises. In 1998, these eight companies consumed a total of 79.6 ODP tonnes of CFC-11 and 52.59 ODP tonnes of CFC-12 in the production of refrigeration equipment such as refrigerators, chest freezers, display cabinets, reach-in refrigerators, water and bottle coolers as well as insulation panels for cold stores. The eight 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 their refrigerant operations from CFC-12 to HFC-134a. The total impact of the projects will be a phase out of 143.19 ODP tonnes.

4. All the enterprises except Sardkaran operate low pressure foaming machines, refrigerant charging equipment, leak detectors and vacuum pumps in the baseline. The proposals include incremental capital costs covering replacement of low pressure foam dispensers with high pressure foaming machines and retrofitting of a high pressure dispenser in Sardkaran, as well as replacement of refrigerant charging equipment and leak detectors and replacement/retrofit of vacuum pumps to handle HFC-134a refrigerant. The projects also include funding for re-design, testing, trials, technical assistance and training. Incremental operating costs are sought for the higher cost of chemicals, including increase in foam density, filter/dryers, condensers and HFC-134a compressors. The costs are requested for a six month period for domestic refrigeration component and for 12 to 24 months for commercial refrigeration operations.

Justification for the Use of HCFC-141b

5. The companies have selected HCFC-141b technology to replace CFC-11 in foam blowing operations. A letter indicating the Government's 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 justifications and undertakings from each enterprise.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat has discussed with UNIDO and UNDP incremental capital and operating costs. Several enterprises use compressors equal to or below 250 wt capacity for some or all of their production. Subsequently, the project costs were re-calculated according to the criteria and threshold for the domestic refrigeration sub-sector. The Secretariat has discussed with UNIDO and UNDP the provision of equivalent refrigerant charging equipment, cost of trials, cost of retrofitting the high pressure dispenser, the prevailing prices of chemicals on the market and the justification for increase in foam density. Additional information has been provided. The eligible level of grant has been recalculated accordingly.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the eight commercial refrigeration projects with the funding levels and associated support costs as indicated below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment and rigid polyurethane foam at Electro Sard Azna Co,.	191,061	24,838	UNDP
(b)	Conversion from CFC-11 tgo HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Electro Shargh Mazandaran Co.	301,715	39,223	UNDP

(c)	Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Khozestan Technique Co.	132,041	17,165	UNDP
(d)	Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Sardkaran Industrial Manufacturing Co.	155,405	20,203	UNDP
(e)	Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Sherkate Sanaayee Toulidy Bard Co.	205,529	26,719	UNIDO
(f)	Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Forouzan Yakhchal Company (Forouzan Ref. Co.)	192,704	25,052	UNIDO
(g)	Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Minavand Refrigeration Company	176,777	22,981	UNIDO
(h)	Conversion from CFC-11 to HCFC-141b and CFC-12 to HFC-134a technology in the manufacture of domestic and commercial refrigeration at the Saiwan Sannat Co.	200,709	26,092	UNIDO