UNITED
NATIONS

EP

United Nations
Environment
Programme

Distr.
LIMITED

UNEP/OzL.Pro/ExCom/34/32
17 June 2001

ORIGINAL: ENGLISH

EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-fourth Meeting
Montreal, 18-20 July 2001

PROJECT PROPOSALS: JORDAN

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

Refrigeration:

• Phasing out of CFC-11 by conversion to HCFC-141b and CFC-12 to HFC-134a in manufacturing commercial refrigeration equipment at fifth group of small size Jordanian commercial refrigerator manufacturers	UNIDO
• Replacement of CFC-11 and CFC-12 with HCFC-141b and HFC-134a in the production of commercial refrigeration equipment at the second medium size commercial refrigerator manufacturers group	UNIDO
• Phasing out of CFC-11 by conversion to HCFC-141b and CFC-12 to HFC-134a in manufacture of commercial refrigeration equipment at sixth group of small size of Jordanian commercial refrigerator manufacturers	UNIDO

Solvent:

• Conversion of metal cleaning processes from TCA solvent to TCE degreasing at the King Hussein Workshop, Zarqa	UNIDO

PROJECT EVALUATION SHEET
JORDAN

SECTOR: Refrigeration ODS use in sector (2000): 242.27 ODP tonnes

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

Project Titles:

(a) Phasing out of CFC-11 by conversion to HCFC-141b and CFC-12 to HFC-134a in manufacturing commercial refrigeration equipment at fifth group of small size Jordanian commercial refrigerator manufacturers
(b) Replacement of CFC-11 and CFC-12 with HCFC-141b and HFC-134a in the production of commercial refrigeration equipment at the second medium size commercial refrigerator manufacturers group
(c) Phasing out of CFC-11 by conversion to HCFC-141b and CFC-12 to HFC-134a in manufacture of commercial refrigeration equipment at sixth group of small size of Jordanian Commercial Refrigerator Manufacturers

Project Data	**Commercial**	**Commercial**	**Commercial**
	Fifth Group	**Second medium size**	**Sixth Group**
Enterprise consumption (ODP tonnes)	26.91	27.18	25.18
Project impact (ODP tonnes)	26.02	26.36	24.35
Project duration (months)	24	36	24
Initial amount requested (US $)	260,562	340,121	299,177
Final project cost (US $):			
Incremental capital cost (a)	162,300	203,700	148,650
Contingency cost (b)	8,430	16,470	7,065
Incremental operating cost (c)	74,224	122,482	130,808
Total project cost (a+b+c)	244,954	342,652	286,523
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
Amount requested (US $)	244,954	342,652	286,523
Cost effectiveness (US $/kg.)	9.41	13.00	11.78
Counterpart funding confirmed?	Yes	Yes	Yes
National coordinating agency	Ministry of Municipal, Rural Affairs & Environment		
Implementing agency	UNIDO	UNIDO	UNIDO

Secretariat's Recommendations			
Amount recommended (US $) Project impact (ODP tonnes) Cost effectiveness (US $/kg) Implementing agency support cost (US $)			
Total cost to Multilateral Fund (US $)			

PROJECT DESCRIPTION

Sector Background

Latest available total ODS consumption (1999)	809.90 ODP tonnes
Baseline consumption of Annex A Group I substances (CFCs)	673.30 ODP tonnes
Consumption of Annex A Group I substances for the year 1999	398.00 ODP tonnes
Baseline consumption of CFCs in refrigeration sector	135.91 ODP tonnes
Consumption of CFCs in refrigeration sector in 2000	242.27 ODP tonnes
Funds approved for investment projects in refrigeration sector as of end of 2000	US $6,458,280.00
Quantity of CFC to be phased out in investment projects in refrigeration sector as of end of 2000	336.35 ODP tonnes

1. The ODS consumption in the refrigeration sector in Jordan was reported to be 173, 190 and 238 ODP tonnes in 1997, 1998, 1999 respectively. According to information from the Government of Jordan, the latest data on ODS consumption in the refrigeration sector in the year 2000 was 230 ODP tonnes, including 155 ODP tonnes for manufacturing of new equipment and 75 ODP tonnes for servicing.

2. The refrigeration sector in Jordan comprises three manufacturers of domestic refrigeration appliances and about 40 small medium-size companies in the commercial refrigeration sub-sector. The Executive Committee has approved US $6,458,280 for 12 investment projects submitted by UNIDO covering 30 major enterprises manufacturing refrigeration equipment to phase out 336.35 ODP tonnes of CFC. It has also approved US $42,000 for a technical assistance project in the air-conditioning, which is under implementation as a bilateral activity with France. The Refrigerant Management Plan for Jordan was approved at the 28th Meeting of the Executive Committee.

Project description

3. Three projects have been submitted to the 34th Meeting for the commercial refrigeration sub-sector in Jordan. The conversion technology is from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a. Two projects cover six small enterprises each. The third project covers three medium-sized enterprises.

4. The twelve small enterprises (Abdoulah Factory, Emad Addin Al-Sareegy, Ma-nna, Al-Mansour, Al-Ostath, Raed, Abu-Khalaf, Al-Taghwa, Farough Refrigeration, Dawudiah Workshop, Makka Refrigeration and Teck-Tack Workshop) consumed 29.85 ODP tonnes of CFC-11 and 22.23 ODP tonnes of CFC-12 in the manufacture of commercial refrigeration equipment in 1999. The three medium-sized enterprises (Abu Azmi, Hasouni Refrigeration and Majdi) consumed 15.98 ODP tonnes of CFC-11 and 11.2 ODP tonnes of CFC-12 on average between 1998 and 1999.

5. The enterprises are involved in the manufacture of various models of commercial chest freezers, water coolers and display cabinets. The small enterprises employ manual mixing and foam pouring for foam operations in the baseline, while the medium-sized enterprises employ locally made low-pressure dispensers. In addition, the enterprises operate simple equipment for charging, evacuation and leak detection of CFC-12 in the baseline.

6. The projects include incremental capital costs for the enterprises, covering refrigerant charging units, leak detectors and vacuum pumps. In addition, the medium-sized enterprises will replace existing low-pressure foaming machines with low-pressure dispensers suited for use with HCFC-141b. Other costs include re-design, testing, technical assistance and training. Incremental operating costs are requested reflecting the higher cost of chemicals and an increase in foam density.

Justification for the use of HCFC-141b

7. Justification for the use of HCFC-141b by companies has been provided in each project and is available in the Secretariat. The Government of Jordan has also provided letters endorsing the use of HCFC-141b by enterprises.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

8. The ODS consumption in the refrigeration sector in Jordan has grown in recent years in spite of ongoing phase out activities from approved investment projects. Thus, consumption increased from 150 ODP tonnes reported in the country programme in 1992 to 230 ODP tonnes in 2000. At the same time UNIDO reported on implementation of seven investment projects in the refrigeration sector in 1999 with total impact of 181.28 ODP tonnes. The Government of Jordan indicates that the number of refrigeration enterprises has grown in recent years due to the influx of refugees into Jordan after the Gulf War. New companies and workshops have been identified through advertising and field visits by the National Ozone Unit staff.

9. Projects submitted to the 26th Meeting in November 1998 described the situation of the consumption in the sector as follows: "The 1992 Country Programme gives the commercial sector usage as 150 actual tonnes of ODS. No further breakdown is given. The commercial refrigeration industry has enjoyed a modest boom as the result of the settlement of about 400,000 Palestinians displaced by the Gulf War, but current consumption are unlikely to be very

different. If current sector consumption is in fact 150 tonnes, this would leave 35 tonnes a year consumed by medium and small service companies across the country. This is credible figure."

10. Jordan's reported consumption in 2000 was 230 tonnes, of which 155 tonnes was for manufacturing of new refrigeration equipment and 75 tonnes was used for servicing. The consumption to be phased out from investment projects approved by the Executive Committee but not yet completed is 137.5 ODP tonnes. An RMP has been approved to address the servicing sector. This leaves 17.5 ODP tonnes to be phased out through future investment projects. The total ODP consumption to be phased out from the three projects submitted to the 34th Meeting is 79.3 ODP tonnes which significantly exceeds the balance of 17.5 tonnes. The situation of ODS consumption in the refrigeration sector in Jordan needs further investigation before any additional projects can be recommended for approval by the Secretariat. The Secretariat notes that the Executive Committee, at its 31st Meeting, approved US $50,000 for the World Bank to update Jordan's country programme.

11. The Secretariat discussed with UNIDO the incremental capital and operating costs of the three projects. The Secretariat has advised UNIDO to classify the relevant part of production of several companies under the domestic refrigeration sub-sector in accordance with Decision 26/36 and recalculate the operating costs accordingly. The cost of technology transfer, model redesign and training appear to be disproportionately high for the group of small size enterprises. The cost of compressors below 250 wt was identified to be higher than agreed between the Secretariat and the Implementing Agencies. UNIDO has agreed to make the necessary adjustments to the incremental capital and operating costs. Accordingly, the Secretariat and UNIDO have agreed on the incremental costs of the three projects however approval by the Executive Committee will be contingent on its views on the situation regarding consumption in the refrigeration sector in Jordan.

PROJECT EVALUATION SHEET
JORDAN

SECTOR: Solvent ODS use in sector (2000): 63 ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Title:

(a) Conversion of metal cleaning processes from TCA solvent to TCE degreasing at the King Hussein Workshop, Zarqa

Project Data	**TCA**
	King Hussein Workshop
Enterprise consumption (ODP tonnes)	64.00
Project impact (ODP tonnes)	6.40
Project duration (months)	18
Initial amount requested (US $)	243,016
Final project cost (US $):	
Incremental capital cost (a)	373,000
Contingency cost (b)	37,300
Incremental operating cost (c)	-174,984
Total project cost (a+b+c)	235,316
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US $)	235,316
Cost effectiveness (US $/kg.)	36.76
Counterpart funding confirmed?	Yes
National coordinating agency	General Corporation for the Environment Protection
Implementing agency	UNIDO

Secretariat's Recommendations	
Amount recommended (US $) Project impact (ODP tonnes) Cost effectiveness (US $/kg) Implementing agency support cost (US $)	
Total cost to Multilateral Fund (US $)	

PROJECT DESCRIPTION

SECTOR BACKGROUND

12. Jordan's reported consumption in the solvent sector in the year 2000 was 5 tonnes of CFC-113 (4 ODP tonnes), 40 tonnes of carbon tetrachloride (CTC) (44 ODP tonnes) and 150 tonnes of 1.1.1 trichloroethane (TCA) (15 ODP tonnes).

13. Jordan has had no investment projects approved in the solvent sector.

Conversion of metal cleaning processes from TCA solvent to TCE degreasing at the King Hussein Workshop, Zarqa

14. King Hussein Workshop services military vehicles. 64 metric tonnes of TCA (6.4 ODP tonnes) are consumed annually in two vapour degreasing machines to clean large metal parts. It is proposed to phase out this consumption by replacing the existing cleaning machines with new equipment that will use trichloroethylene (TCE) as a solvent. The new machines are designed to reduce the emission of solvent during use and are equipped with internal recycling facilities. A solvent recovery unit is also proposed to recover the solvent from the sump wastes produced by the machines. These two measures will meet current health and environmental requirements for handling TCE and will reduce solvent consumption by about 40 per cent. The main capital equipment items are the two cleaning machines at US $150,000 each and the solvent recovery unit at US $35,000. Incremental operating savings over four years of US $174,984 have been deducted from project costs.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

15. The safety standards applicable to use of the new solvent, TCE, are the subject of debate among experts. It is more toxic than TCA and a European Union working group has re-classified it under a category of substances which "may cause cancer". UNIDO advises that the likely future regulatory implication of this re-classification in EU countries is that TCE limits for operator safety and for air emissions will be set at levels which cannot be obtained other than by providing new equipment designed to reduce emissions by closure of the machines and by recycling the solvent. Other experts advise that on scientific grounds the EU reclassification is not justified and that current emission limits for worker safety of about 50 parts per million can be met in many cases by retrofitting existing degreasing machines provided they are not too old and in reasonable condition. Retrofitting would be less costly but would not reduce emissions or reduce solvent use as much as a new machine.

16. While acknowledging the cost saving, UNIDO does not consider the retrofitting option feasible because it would not be an appropriate response to the latest information on TCE

toxicity, because the expertise to undertake the retrofit may not be available in the country and because, after deducting operating savings from retrofit costs there may not be enough funding left to implement the project.

17. The Secretariat and UNIDO are seeking more specific information on the feasibility and cost of retrofitting the particular machines in use in the King Hussein Workshop. The Sub-Committee on Project Review will be advised as to whether the project can be recommended on the basis of replacement cleaning equipment as proposed.

RECOMMENDATION

18. PENDING
