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Executive Committee of
the Multilateral Fund for the
Implementation of the Montreal Protocol

Nineteenth Meeting
Montreal, 8-10 May 1996

PROJECT PROPOSALS: PERU

This document includes the Comments and Recommendations from the Fund Secretariat on the following projects:

Refrigeration

- | | |
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| • Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Col-Frio | UNDP |
| • Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Master Service, S.A. | UNDP |
| • Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Compañía Peruana de Máquinas para Coser S.A. (Copemaco) | UNDP |
| • Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers and refrigerators at Formetal | UNDP |
| • Implementation of a national programme for recovery and recycling of refrigerant | UNDP |

PROJECT EVALUATION SHEET**PERU**

SECTOR: REFRIGERATION ODS use in sector (1995): 282.4 ODP tonnes

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

Project Titles:

- (a) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Master Service S.A.
- (b) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Compañía Peruana de Máquinas para Coser S.A. (Copemaco)
- (c) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers and refrigerators at Formetal
- (d) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Col-Frio, S.A.

Project Data	Commercial Refrigeration			
	Master	Copemaco	Formetal	Col-Frio
ODS phase-out (ODP tonnes)	9.44	12.90	7.80	11.70
Proposed project duration (Yrs)	1.5	1.5	1.5	1.5
Incremental capital cost (US\$)	133,500	143,000	96,000	137,500
Contingency (%)	10	10	10	10
Incremental operational cost (US\$)	45,118	50,834	29,648	41,185
Total project cost (US\$)	178,618	193,834	125,648	178,685
Local ownership (%)	100	100	100	100
Export component (%)	0	0	0	0
Amount requested (US\$)	143,500	195,000	118,000	176,000
{ Original				
{ Revised				
Cost effectiveness (US\$/kg)	14.83	15.03	15.13	14.96
National Coordinating Agency	Oficina Técnica de Ozono			
Implementing Agency	UNDP	UNDP	UNDP	UNDP
Technical review completed?	Yes	Yes	Yes	Yes

Secretariat's Recommendations				
Amount recommended (US \$)	140,000	193,834	118,000	175,000
Project impact (ODP tonnes)	9.44	12.90	7.80	11.70
Cost effectiveness (US \$/kg)	14.83	15.03	15.13	14.96
Implementing Agency support cost (US\$)	18,200	25,198	15,340	22,750
Total cost to Multilateral Fund	158,200	219,032	133,340	197,750

PROJECT DESCRIPTION

- (a) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Master Service S.A.
- (b) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Compañía Peruana de Máquinas para Coser S.A. (Copemaco)
- (c) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers and refrigerators at Formetal
- (d) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Col-Frio, S.A.

1. ODS consumption in the commercial refrigeration sector is estimated at 282.4 MT. The sector comprises ten enterprises with a total annual production volume of 148,911 units. ODS phase-out projects for six companies were approved at the 15th Meeting of the Executive Committee.

2. The four projects submitted cover conversion of four remaining medium-size enterprises which manufacture a range of commercial chest freezers.

3. Conversion to HFC-134a refrigerant entails replacement of existing leak detectors and evacuation/charging systems with new equipment suitable for HFC-134a refrigerant, as well as redesign and modification of refrigeration systems.

4. The conversion to HCFC-141b based foam formulation involves the replacement of low pressure foaming machines, which cannot be retrofitted, with high pressure dispensers in three enterprises. New foam equipment will enable implementation of emerging ODS-free technologies.

5. Cost for retrofitting of the existing low-pressure foaming machine to be able to use HCFC-141b was requested in the Formetal project. Discussions with the machine supplier confirm that this equipment can be retrofitted to use HCFC-141b foam formulations. Replacement of the retrofitted machine to a high pressure machine, if need be, will be undertaken at a later stage by the company, at its own expenses.

6. The companies recognize the transitional nature of HCFC foam technologies. They prefer to switch to a combination of water/HCFC-141b based technology at this stage, and to eventually implement ODS-free conversion based on either cyclopentane or another commercially developed and acceptable alternative. This selection is supported by the responsible Peruvian Government counterparts. The four companies understand and accept that the costs associated with the required future change to a zero-ODP technology will not be funded by the Multilateral Fund.

7. The companies requested incremental operational cost associated with higher cost of components and foam formulation for a period of six months. However, three of the companies are requesting partial funding as follows: 14% for Master Service, 91% for Col-Frio, and 74% for Formetal.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The chosen technologies are proven. The choice of interim HCFC technologies is justified.
2. The Secretariat discussed with UNDP the eligibility and incrementality of all cost items. The cost of foaming equipment was adjusted in accordance with the capacity of existing equipment. The costs of charging machines and vacuum pumps were also adjusted in accordance with the available quotations. For some companies the requested share of eligible operating costs were increased. The project budget has been adjusted accordingly.

RECOMMENDATIONS

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

	Project Cost US \$	Support Cost US \$	Cost Effectiveness US \$/kg.
(a) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Master Service S.A.	140,000	18,200	14.83
(b) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Compañía Peruana de Máquinas para Coser S.A. (Copemaco)	193,834	25,198	15.03
(c) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers and refrigerators at Formetal	118,000	15,340	15.13
(d) Elimination of CFC-11 and CFC-12 in the manufacture of chest freezers at Col-Frio, S.A.	175,000	22,750	14.96

PROJECT EVALUATION SHEET

PERU

SECTOR: **REFRIGERATION** ODS use in sector (1993): 223.4 ODP tonnes
CFC RECOVERY AND RECYCLING

Project Title:

Implementation of a national programme for recovery and recycling of refrigerant

Project Data	Recovery and recycling
ODS phase-out (ODP tonnes)	28.6
Proposed project duration (Yrs)	1.5
Incremental capital cost (US \$)	342,695
Incremental operational cost (US \$)	-
Total project cost (US \$)	342,695
Amount requested (US \$) {Original}	349,695
{Revised}	342,695
Cost effectiveness (US \$/kg)	11.97
National Coordinating Agency	Ministerio de Industrias, Turismo, Integración y Negociaciones Comerciales e Internacionales (MITINCI)
Implementing Agency	UNDP
Technical review completed?	Yes

<i>Secretariat's Recommendations</i>	
Amount recommended (US \$)	342,695
Project impact (ODP tonnes)	28.6
Cost effectiveness (US \$/kg)	11.97
Implementing Agency support cost (US\$)	44,550
Total cost to Multilateral Fund	387,245

PROJECT DESCRIPTION

1. The project will implement a comprehensive national programme for recovery and recycling of refrigerants in the refrigeration, air conditioning and mobile air conditioning sub-sectors. This programme is part of an overall ODS phase out strategy for the refrigeration sector.
2. The first priority in this programme is to stop CFC discharge into the atmosphere by repairing leaks and controlling unnecessary emissions from refrigeration equipment, followed by CFC recovery from existing installations during maintenance and prior to retrofits or dismantlement.
3. A recovery and recycling nation-wide network comprised of 120 recovery units and 8 recycling centres will be established, at a cost of US \$316,195. Any CFC-recovered by companies or workshops not included in the recovery network will also be treated in the recycling centers. In total, 28.6 tonnes of CFC will be recovered and recycled each year. This amount does not take into account the amount of refrigerant that might be saved owing to the teaching of good service and maintenance practices at the training seminars.
4. Eight training workshops for service technicians of refrigeration and air conditioning equipment, at a cost of US \$26,500, are envisioned which will include a practical demonstration on recovery and recycling equipment; good service practices and safety in the handling of refrigerants during installation, servicing, retrofitting and dismantlement of refrigeration and/or air conditioning equipment; and detection of CFC leaks and prevention of emissions. The workshops will utilize some of the training documentation and materials used in previous workshops as well as those prepared by UNEP.
5. To ensure the success of the programme, the Government will introduce a monitoring system to check the amount of CFC being recovered and recycled by each piece of recovery equipment and assure the quality of the recycled refrigerant. The ozone unit will be responsible for monitoring the programme.

SECRETARIAT'S RECOMMENDATION

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

Project	Project Cost US \$	Support Cost US \$	Implementing Agency
Implementation of a National Programme for Recovery and Recycling of Refrigerant	342,695	44,550	UNDP