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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 PROPOSAL: COLOMBIA

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

Refrigeration

- Elimination of CFC-11 and 12 in the manufacture of commercial refrigeration equipment at Refrigeracion Supernordico Ltda.

UNDP

PROJECT EVALUATION SHEET COLOMBIA

SECTOR: REFRIGERATION ODS use in sector (1995): 390 ODP tonnes

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

Project Titles:

Elimination of CFC-11 and 12 in the manufacture of commercial refrigeration equipment at Refrigeracion Supernodico Ltda.

Project Data	Commercial
	Supernodico
ODS phase-out (ODP tonnes) ¹	10.77
Proposed project duration (Yrs)	1.5
Incremental capital cost (US\$)	162,500
Contingency (%)	10
Incremental operational cost (US\$)	0
Total project cost (US\$)	163,500
Local ownership (%)	100
Export component (%)	0
Amount requested (US\$) {Original	163,500
{Revised	
Cost effectiveness (US\$/kg)	15.09
National Coordinating Agency	MMA
Implementing Agency	UNDP
Technical review completed?	Yes

<i>Secretariat's Recommendations</i>	
Amount recommended (US \$)	162,500
Project impact (ODP tonnes)	10.77
Cost effectiveness (US \$/kg)	15.09
Implementing Agency support cost (US\$)	21,125
Total cost to Multilateral Fund	183,625

¹ Figures for 1994 or average of 1992-1994.

PROJECT DESCRIPTION

Elimination of CFC-11 and 12 in the manufacture of commercial refrigeration equipment at Refrigeracion Supernordico Ltda.

1. CFC consumption in the domestic and commercial refrigeration sector in Colombia is estimated at 400 tonnes. Projects to eliminate about 250 tonnes were approved by the Executive Committee. Refrigeracion Supernordico Ltda is another sizable enterprise engaged in the manufacture of commercial refrigeration equipment such as commercial refrigerators, freezers, bottle coolers, show cases and "walk in" chillers. There are still a number of enterprises engaged in the manufacture of commercial refrigeration equipment although the majority of the rest are very small enterprises. Their consumption is estimated at 10 tonnes.

2. The project covers phase-out of 10.77 ODP tonnes by converting to HFC-134a as a refrigerant and HCFC-141b as a blowing agent. Whilst recognizing the environmental benefits of cyclo-pentane versus HCFC-141b, Refrigeracion Supernordico selected HCFC-141b as a first stage, interim, replacement for CFC-11 as it provides the best energy efficiency, and the lowest investment and operational costs. It is also most suited to the factory layout and present skill levels of the work-force at Refrigeracion Supernordico. This selection is supported by the Colombian Ministerio del Medio Ambiente, the responsible Colombian Government counterpart. Refrigeracion Supernordico understands that HCFC-141b is an interim solution which will require a change to an appropriate zero-ODP technology (either cyclo-pentane, or another commercially developed and acceptable alternative) at some future date. Refrigeracion Supernordico also understands and accepts that the costs associated with that subsequent technology change is for its own account.

3. The conversion will involve replacing the existing refrigeration system with a charging board, vacuum pumps and leak detectors suitable for HFC-134a as well as prototype testing. The low pressure foaming machine will be replaced with a high pressure foaming machine. The project will provide funds for training and technology transfer.

4. The enterprise will not request the incremental operating costs.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The chosen technologies are proven. The choice of an interim HCFC technology in foaming operations is justified.
2. The Secretariat discussed with UNDP the eligibility and incrementality of all cost items. The cost of a charging machine, vacuum pumps and a foaming machine were adjusted in accordance with recent quotations. The cost of redesign prototyping, testing and pilot scale production was increased in accordance with a number of models produced. 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.
Elimination of CFC-11 and 12 in the manufacture of commercial refrigeration equipment at Refrigeracion Supernodico Ltda.	162,500	21,125	15.09