



**United Nations
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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-third Meeting
Montreal, 12-14 November 1997

PROJECT PROPOSAL: CUBA

This documents includes the comments and recommendations of the Fund Secretariat on the following project proposal:

Refrigeration

- Umbrella project for elimination of CFCs 11 and 12 in the manufacture of unitary commercial refrigeration equipment at Empco-Mincin and Segere-Sime "Dionisio Rodrigues"

UNDP

PROJECT EVALUATION SHEET **CUBA**

SECTOR: REFRIGERATION ODS use in sector (1996): 3.2 ODP tonnes

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

Project Title:

Umbrella project for the elimination of CFCs-11 and 12 in the manufacture of unitary commercial refrigeration equipment at Empco-Mincin and Seger-Sime 'Dionisio Rodriguez'

Project Data	Commercial refrigeration	
	Empco-Mincin and Seger-Sime 'Dionisio Rodriguez'	
ODS phase-out (ODP tonnes)		3.2
Proposed project duration (months)		24
Incremental capital cost (US \$)		77,660
- including contingency (%)		10
Incremental operational cost (US \$)		41,485
Total project cost (US \$)		119,505
Local ownership (%)		100
Export component (%)		
Amount requested (US \$) {Original}		119,505
{Revised}		
Cost effectiveness (US \$/kg)		36.91
National Coordinating Agency	Ministry of Science, Technology and Environment (OTOZ)	
Implementing Agency	UNDP	
Technical review completed?	Yes	

<i>Secretariat's Recommendations:</i>		
Amount recommended (US \$)		119,505
Project impact (ODP tonnes)		3.2
Cost effectiveness (US \$/kg)		36.91
Implementing Agency support cost (US \$)		15,535
Total cost to Multilateral Fund (US \$)		135,040

PROJECT DESCRIPTION

Umbrella project for the elimination of CFCs-11 and 12 in the manufacture of unitary commercial refrigeration equipment at Empco-Mincin and Seger-Sime 'Dionisio Rodriguez'

1. ODS consumption in the affected sector is estimated at 3.2 tonnes (1993) and was quoted to grow by 3% per year. Annual production reached 1544 units in 1993. This is the first project in commercial refrigeration sector.
2. Approval of this project proposal would eliminate 3.2 ODP tonnes based on the 1996 consumption enabling Cuba to meet its Montreal Protocol obligations. Following completion of this umbrella project, the Government of Cuba envisions introducing legislation to prohibit the manufacture, import, and sale of commercial refrigeration equipment containing, or designed for CFCs.
3. There are two commercial refrigeration companies in Cuba. The project is submitted as an umbrella project. Implementation of the project will lead to complete ODS phase out in manufacturing of new commercial refrigeration equipment.
4. EMPCO-MINCIN manufactures ice machines, chest freezers and water coolers. SEGERE-SIME produces water coolers, commercial cold rooms and chest freezers.
5. The companies will convert from CFC-11 to HCFC-141b for its foaming and will not request the costs of a subsequent technology to change to zero-ODP technology. One new small-output high pressure foam dispensing machine is required.

Justification for HCFC-141b technology:

6. This technology 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 workforce. It is also the technology adopted by all of the companies's competitors in Central America, Mexico, and most South American countries. There are no local suppliers of cyclopentane due to very low demand. The management also has concerns regarding the longer term safety issues related to cyclopentane. Water blown foam does not meet the company's energy efficiency requirements. New generation of HFC blowing agents will be the logical choice in the future.
7. This project selected HFC 134a to replace CFC-12 use. New compressors, refrigerator system designs, and evacuation systems are required. Six vacuum pumps will be retrofitted, 2 charging manifold, 2 charging cylinders with hoses, and 2 leak detectors are requested.
8. Incremental operating costs are for chemicals and components and are requested for two years.
9. No statement is made about the destruction of replaced equipment.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The chosen technologies are proven. The choice of interim HCFC technology in foaming operations is justified.
2. Cost effectiveness of the umbrella project is US \$ 36.91/kg ODP. Cost-effectiveness of two individual companies is US \$ 37.86/kg and US \$ 33.14/kg which exceed the cost-effectiveness threshold established in the commercial refrigeration sector. Cuba is a low consuming Article 5 country and, therefore, cost-effectiveness threshold may not apply.
3. Incremental capital and operating costs are justified.

RECOMMENDATION(S)

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 Cost US \$	Support Cost US \$	Implementing Agency
Umbrella project for the elimination of CFCs-11 and 12 in the manufacture of unitary commercial refrigeration equipment at Empco-Mincin and Seger-Sime 'Dionisio Rodriguez'	119,505	15,535	UNDP