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

Seventeenth Meeting
Montreal, 26-28 July 1995

PROJECT PROPOSALS: CHINA

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

- Conversion from CFC-11 to Cyclopentane in Domestic Refrigerator Manufacturing Plant at Chang Ling Co. Ltd. World Bank
- Conversion of Compressor Production for Domestic Refrigerators from CFC-12 to Hydrocarbon Refrigerant at Jiaxipera Compressor Factory UNIDO

PROJECT EVALUATION SHEET

COUNTRY OR REGION: China

PROJECT TITLE: Conversion from CFC-11 to Cyclopentane in Domestic Refrigerator Manufacturing Plant at Chang Ling Co. Ltd.

BUDGET: Capital Costs: US \$3,989,000¹
Operational Costs: US \$ 778,000

INCREMENTAL COSTS: US \$4,601,000²

ODS PHASE-OUT: 430 MT of CFC-11

COST EFFECTIVENESS³: US \$8.36 per kg. ODP saved

PROJECT DURATION: 1.5 years

IMPLEMENTING AGENCY: World Bank

NATIONAL COORDINATING AGENCY: NEPA

TECHNICAL REVIEW COMPLETED: YES X NO

SECRETARIAT'S COMMENTS

1. The project covers the conversion of a domestic refrigerator manufacturing company which comprises two factories. The total annual output of the company is about 537,000 household refrigerators and freezers. This project proposes to replace the CFC-11 used as a blowing agent in the production of insulation foam with cyclopentane. The proposal is included in the strategy of the Government of China for the phase out of CFC in the domestic refrigeration sector.

¹ Including a 10 per cent contingency fee.

² Including 3 per cent financial agent fee.

³ Determined as the ratio of incremental costs, excluding safety-related costs, to the estimated annual savings of ODP (\$/ODP kg.). For CFC-11 and CFC-12, ODS=ODP.

2. The proposal includes: modification of existing equipment where applicable; procurement and installation of new equipment or machinery including safety measures for the use of cyclopentane, modification of assembly lines, refrigerator redesign, testing and development of prototypes, and a training programme.

3. Chang Ling is in the process of implementing a project to test the performance of a binary blended refrigerant (HFC-152a)/HCFC-22) approved by the Executive Committee at its 13th Meeting at a cost of US \$853,000. No additional funds will be requested to complete the ODS phase-out at Chang Ling.

4. The incremental operating costs include the additional costs of raw materials for a six-month duration. The requested operating costs need to be clarified since a new production line has been recently installed. Operating costs arising from this new line should be subtracted from the requested operating costs.

5. A technical review was provided by the World Bank.

6. The enterprise has converted to 50 per cent CFC reduced technology. It is reported that implementation of this project will result in the phase-out of 430 ODP tonnes of CFCs. This figure will have to be verified to exclude past consumption and consumption due to the new line.

7. The Secretariat reviewed the project proposal to assess the eligibility and costs of the requested equipment for the conversion to cyclopentane foaming, in light of similar projects approved by the Executive Committee and other projects submitted from China to the 17th Meeting in the subsector. Costs requested for several items substantially exceed costs for similar items in projects approved by the Executive Committee and in projects submitted from China for the current meeting by other implementing agencies. Additional information was provided from the World Bank. However, major issues concerning eligibility and level of costs are still outstanding, and the project can not be recommended for approval at this stage.

SECRETARIAT'S RECOMMENDATIONS

8. The Fund Secretariat recommends the project be deferred.

PROJECT EVALUATION SHEET

COUNTRY OR REGION: China

PROJECT TITLE: Conversion of the compressor production for domestic refrigeration from CFC-12 to hydrocarbon refrigerant at Jiaxipera compressor factory

BUDGET: Capital Costs: US \$3,310,000
Operational Costs: not claimed

INCREMENTAL COSTS: US \$3,310,000

ODS PHASE-OUT: 296 T

COST EFFECTIVENESS⁴: US \$11.18 per kg. ODP saved

PROJECT DURATION: Two years

IMPLEMENTING AGENCY: UNIDO

NATIONAL COORDINATING AGENCY: National Environment Protection Agency ((NEPA)

TECHNICAL REVIEW COMPLETED: YES X NO

SECRETARIAT'S COMMENTS

1. The project covers the conversion of a production of CFC-12 compressors to isobutane refrigerants at Jiaxipera company. The annual output of the company is 600,000 compressors. The proposal is included in the strategy of the Government of China for the phaseout of CFC in the domestic refrigeration sector. The Executive Committee approved at the 13th Meeting, two compressor manufacturing conversion projects from CFC-12 to HFC-134a refrigerant. This project is the first of its kind to produce Isobutane compressors in an Article 5 country. A project was approved for Germany-USA bilateral assistance to produce 100 per cent hydrocarbon based refrigerators at the 16th Meeting. Two more projects are being submitted to the 17th Meeting.

⁴ Determined as the ratio of incremental costs to the estimated annual saving of ODP by end-users of Jiaxipera's compressors (indirect impact) (\$/ODP kg.). For CFC-12, ODS=ODP.

2. The proposal includes: redesign, prototyping and testing; modification of existing equipment where applicable; procurement and installation of new equipment or machinery; modification of assembly lines and safety measures.
3. A technical review was provided by UNIDO.
4. The Secretariat reviewed the project proposal to assess the eligibility and costs of the requested equipment and other project components for the conversion to isobutane refrigerant technology. The Secretariat discussed with UNIDO the incrementality of all cost components and their amounts.
5. It was agreed that replacement of capital equipment will be eliminated where retrofitting was possible. Thus, only retrofit costs of existing boring machines and drilling and calorimeter are recommended. Technological upgrades were identified and the relevant costs have been deducted from the budget.
6. Operating costs were not claimed.
7. Consequently, it was agreed that the new project budget should be recommended for approval.
8. It was also agreed that cost-effectiveness cannot be meaningfully calculated for compressor manufacturer conversion project. The Executive Committee might wish to use conversion cost per unit as an indicator to compare relative cost-effectiveness of this type of projects. The conversion cost per unit in Jiaxipera project is US \$2.48 per unit.

SECRETARIAT'S RECOMMENDATIONS

9. The Fund Secretariat recommends approval of US \$1,490,000 for the implementation of the project at Jiaxipera, and recommends US \$193,700 in support costs for UNIDO.
10. It is further recommended that the funding approved should be considered as part of future allocation for the implementation of China's strategy in the domestic refrigeration sector.
11. The Fund Secretariat recommends also to transfer the approved allocations to UNIDO from the amount of US \$8,900,000 reserved by the Executive Committee for funding of projects in mobile air-conditioner and compressor sub-sector in 1995.