



United Nations Environment Programme



Distr.
LIMITED



UNEP/OzL.Pro/ExCom/10/31/Add.1
11 June 1993

ORIGINAL: ENGLISH

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

Tenth Meeting
Montreal, 28-30 June 1993

Addendum

PROJECT PROPOSALS: CHINA

PROJECT EVALUATION SHEET

COUNTRY OR REGION: China

PROJECT TITLE: Tianjin Conversion to CFC-free Technology in the Manufacture of Flexible Polyurethane Foam

BUDGET: US \$1,080,000 (Capital Costs)

INCREMENTAL COSTS: US \$1,080,000¹

ODS PHASE-OUT: 180 MT of CFC-11

COST EFFECTIVENESS: US \$6.00 per Kg. ODP saved²

PROJECT DURATION: One year

IMPLEMENTING AGENCY: UNDP

NATIONAL COORDINATING AGENCY: National Environmental Protection Agency (NEPA)
Ministry of Light Industry (MLI)

TECHNICAL REVIEW COMPLETED: YES X NO

SECRETARIAT'S COMMENTS

1. The Tianjin plant is one of the leading enterprises in foam production in China and is therefore selected by the MLI as a demonstration plant for the dissemination of phase-out technology in this sector in China. It should be noted that the World Bank is submitting, at this meeting, a project for phase-down of CFC-11 in the rigid foam sector in the same plant.
2. This project proposal is well documented and provides detailed information on technologies and rationale for their choice. It also furnishes equipment manufacturers' price lists.
3. The technologies chosen are:
 - 1) Methylene chloride technology, chosen as the economical solution for Tianjin's traditional foam production line and it allows the company to produce low density and super soft grade foams.
 - 2) Envirocure process (which eliminates the need for an auxiliary blowing agent for cooling purposes and for density reduction) as the production technology covering a full range of foam qualities utilizing only chemically generated

carbon dioxide as a blowing agent. This patented system is now in production in about 10 facilities in the U.S.A.

4. Installation of ventilation and recovery system is planned in order to protect workers' health and recovery of methylene chloride.
5. Costs of testing equipment are shared by the company and the Fund.
6. Incremental recurring costs of Envirocure process caused by the high cost of Toluene Diisocyanate (TDI) (generating carbon dioxide) are offset by incremental recurring savings of methylene chloride technology caused by the low cost of methylene chloride compared to CFC-11.
7. The project will result in an estimated annual phase-out of 180 tonnes of CFC-11³. Cost effectiveness of US \$6.00/kg. ODP saved is lower than other projects in flexible foam sector which was approved by the Executive Committee at its Eighth Meeting.

SECRETARIAT'S RECOMMENDATIONS

8. The project is recommended for final approval and for funding in the amount of US \$1,080,000.

Endnotes:

1. Incremental recurring costs and savings are balanced.
2. Determined as the ratio of incremental costs to the estimated annual saving of ODP. For CFC-11, ODS = ODP.
3. Use of CFC-11 in 1991 was 180 tonnes.

PROJECT EVALUATION SHEET

COUNTRY OR REGION: China

PROJECT TITLE: 50 per cent Reduced CFC Foam

BUDGET: US \$7,165,000

INCREMENTAL COSTS: US \$5,936,000¹

ODS PHASE-OUT: 372 MT of CFC-11

COST EFFECTIVENESS: US \$16.00 per Kg. ODP saved²

PROJECT DURATION: Four years

IMPLEMENTING AGENCY: The World Bank

NATIONAL COORDINATING AGENCY: National Environmental Protection Agency (NEPA)
Ministry of Light Industry (MLI)

TECHNICAL REVIEW COMPLETED: YES X NO

SECRETARIAT'S COMMENTS

1. The original proposal was submitted to the Seventh Meeting of the Executive Committee as part of the group of sub-projects entitled, "China - First ODS phaseout investment project". The Executive Committee approved the sub-project at the said meeting at a cost of US \$2,358,000. Subsequently, US \$480,000 was transferred to UNDP for a component³ of the sub-project.
2. The sub-project was re-submitted to the Ninth Meeting of the Executive Committee with a request for an additional funding of US \$5,770,000. "The Executive Committee [at its Ninth Meeting] agreed to give the World Bank permission to proceed with further arrangements covering this project (50 per cent CFC-Reduced Foam) at the funding level requested with a clear understanding that such approval would in no way prejudice the final approval of the final funding level when the World Bank would re-submit the project to the Executive Committee with the information requested" (UNEP/OzL.Pro/ExCom/9/20, paragraph 122).
3. The sub-project is being re-submitted to the Executive Committee with a request for a revised incremental cost in the amount of \$4,058,000 beyond the remainder of funds approved at previous Committee meetings.
4. The sub-project proposes activities in 11 different entities⁴ including: two design

institutions (development of new polyol technology), two chemical producers (production of new polyol), and three panel and four refrigerator manufacturers. The letter from the World Bank Ozone Operation Resource Group reviewer was attached to the project proposal. The Government of China has requested the World Bank to submit the project proposal with a request of \$4,058,000.

5. The technical review suggested that the costs of trial production runs should be capped at US \$25,000 and US \$50,000 for the Liming and Tianjin facilities, respectively.

6. Costs for depreciation were included in the cost for the Liming institute. Personal computers were included at the Wuxi and Shuangyan facilities. Depreciation and the purchase of personal computers not required for conversion purposes are not eligible incremental costs.

7. The cost of training included the cost for a foreign expert although the Qindao facility has produced some models for export with reduced CFC formulations since 1991.

8. The Liming Chemical Research Institute and Number 510 Research Institute are involved in the same research and development activities for the development of polyol and blended polyol production.

SECRETARIAT'S RECOMMENDATIONS

9. It is recommended that funding for research at both design institutes would constitute double-counting and therefore, the No. 510 Research Institute project (US \$305,000) is not an incremental cost.

10. Per the technical review, funds for trial production costs at Liming design institute and Tianjin panel project should be reduced by US \$35,000 and US \$50,000, respectively.

11. The costs for depreciation (US \$12,000) should be subtracted from Liming project.

12. Personal computer costs, not required as part of conversion costs, in the Wuxi (US \$3,000) and Shuangyan projects (US \$20,000) should be deleted.

13. The cost of training of Qindao project should be reduced from US \$75,000 to US \$10,000.

14. The project is recommended for final approval in the amount of US \$3,495,000 in addition to the funds already approved. It is further recommended that the following issues be considered during final appraisal:

- . A determination of whether two control instruments (US \$15,000) and a computer control system (US \$36,000) at Wuxi will perform the same function;

- . Funds for trial production at chemical manufacturers in the Liming project should be utilized at chemical manufacturers other than Shenyang, Wuxi and Tianjin;
 - . The cost of trial production for the Shenyang project (US \$340,000) should be re-evaluated since the total project cost may become negative after re-appraisal.
15. It is also recommended that any remaining problems which were raised by the OORG member and the Secretariat should be resolved during the appraisal mission. If necessary, costs of individual items may be adjusted accordingly. The results of the appraisal should be reported to the Executive Committee.

Endnotes:

1. US \$1,878,000 has been allocated for this activity at the Seventh Meeting of the Executive Committee. US \$4,058,000 are additionally requested at the Tenth Meeting of the Executive Committee.
2. Determined as the ratio of incremental costs to the estimated annual saving of ODP. For CFC-11, ODS=ODP.
3. Technical assistance for the Beijing Household Electric Appliances Research Institute (BHEARI).

4. The following table lists the projects per entity, the amount of CFC-11 to be phased out:

	CFC-11 (Phase-Out tonnage)	Incremental Costs (US \$1,000)		
		Investment Costs	Net Operational* Cost/Savings for four years (in US\$ thousands)	Total**
Design Institutes:				
Liming	0	504	0	580
510	0	305	0	351
New Polyol:				
Shenyang	0	485	-333	175
Wuxi	0	318	- 51	307
(Tianjin)				
Panel:				
Chengde	32	117	46	187
Dalian	14	198	77	316
Tianjin	31	306	144	517
Refrigerator:				
Qindao	61	229	312	622
Xinfei	103	164	878	1,198
Shangling	103	271	687	1,102
Shuangyan	28	182	323	581
Totals	372	3,079	2,083	5,936

* Net present value of first four years of operating costs/savings discounted by 12 per cent.

** The figures in this column include 15 per cent contingency.