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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-fifth Meeting
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# PROJECT PROPOSALS: INDIA

This document consists of the comments and recommendations of the Fund Secretariat on the following project proposals:

Process Agent:

| | |
|---|---|
| • Conversion of carbon tetrachloride (CTC) as process agent to cyclohexane at Amoli Organics Limited, Mumbai | UNIDO |

Refrigeration:

| | |
|---|---|
| • Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Ice-Make Refrigeration | UNDP |
| • Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Konark Refrigeration Appliances P. Ltd. | UNDP |
| • Conversion from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at fourteen enterprises | UNDP |
| • Conversion from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at nine enterprises | UNDP |

# PROJECT EVALUATION SHEET
# INDIA

SECTOR: Process Agent ODS use in sector (2000): 4,067 ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

***Project Title***:

(a) Conversion of carbon tetrachloride (CTC) as process agent to cyclohexane at Amoli Organics Limited, Mumbai

| **Project Data** | **Process conversion** |
|---|---|
| | **Amoli** |
| Enterprise consumption (ODP tonnes) | 40.70 |
| Project impact (ODP tonnes) | 40.70 |
| Project duration (months) | 24 |
| Initial amount requested (US $) | 419,735 |
| Final project cost (US $): | |
| Incremental capital cost (a) | 369,607 |
| Contingency cost (b) | 36,961 |
| Incremental operating cost (c) | 13,167 |
| Total project cost (a+b+c) | 419,735 |
| Local ownership (%) | 100% |
| Export component (%) | 0% |
| **Amount requested (US $)** | 419,735 |
| Cost effectiveness (US $/kg.) | 10.31 |
| Counterpart funding confirmed? | Yes |
| National coordinating agency | Ministry of Environment and Forest, Ozone Cell |
| Implementing agency | UNIDO |

| ***Secretariat's Recommendations*** | |
|---|---|
| Amount recommended (US $) | |
| Project impact (ODP tonnes) | |
| Cost effectiveness (US $/kg) | |
| Implementing agency support cost (US $) | |
| Total cost to Multilateral Fund (US $) | |

## SECTOR BACKGROUND

1. The latest consumption (2000) reported to the Secretariat by the Government of India in the process agent sector is 4,066.70 ODP tonnes of CTC. Currently 11 projects are under implementation in the sector, with a total phase out of 1,095.80 ODP tonnes. The consumption in the sector remaining to be addressed is 2,970.90 ODP tonnes.

Sub-Sector profile

2. This is the first project submitted for the phase-out of CTC as a process agent in the manufacture of the pharmaceutical chemical diclofenac sodium. As required by Decision 27/78 a profile of the sub-sector has been included in the project document. The profile indicates that only two enterprises are currently consuming CTC in the manufacture of this chemical, Amoli Organics Ltd (this project) and Kairav Chemicals Ltd. UNIDO advised that the Government of India had been requested to confirm that apart from these two enterprises no further funding would be sought for projects for conversion of the manufacture of diclofenac sodium. A response was received from India via UNIDO containing contradictory information that appeared to indicate there were additional enterprises in this sub-sector consuming CTC. UNIDO has been asked to obtain clarification and the Sub-Committee on Project Review will be advised of the outcome.

Conversion of Carbon Tetrachloride (CTC) as process agent to cyclohexane at Amoli Organics Limited, Mumbai

3. The objective of this project is to eliminate the use of CTC as a process agent in the production of 2,6 dichlorophenol, a starting material for diclofenac, by Amoli Organics Ltd. at its plant in Vapi, in the province of Gujarat. The production capacity of the facility proposed for funding is 300 tonnes of diclofenac sodium per annum.

4. In the last three years of operation, Amoli Organics consumed an average of 37 ODP tonnes of CTC as a process agent in the production of 209.7 tonnes of diclofenac sodium annually.

5. The production of 2,6 dichlorophenol will be converted from CTC to cyclohexane. The technical requirements of the new process require that much of the existing equipment be replaced. The main capital cost items requested are a storage tank (US $25,000), a filter system (US $65,000), chilling plant (US $45,000), solvent recovery unit (US $65,000), nitrogen generator (US $35,000) and a fire safety system (US $18,000). Incremental operating costs arising mainly from increased power consumption are requested for one year at a level of US $13,167.

## SECRETARIAT'S COMMENTS

### COMMENTS

6. UNIDO has indicated that this is the only project for manufacture of diclofenac sodium in India. Confirmation of this has been sought from the Government of India, but a letter had not been received at the time of preparation of this document.

7. The project is broadly similar to those approved for the ibuprofen sub-sector. Some new process equipment items are required take account of different process conditions arising from the use of cyclohexane instead of CTC. Fire protection is required because cyclohexane is flammable. The Secretariat discussed with UNIDO a number of issues arising from the submission including: enterprise consumption; partial plant closure, eligibility of costs for replacement of certain existing equipment items, and; cost of the replacement process agent, cyclohexane, used in incremental operation cost calculations.

8. UNIDO clarified many of the issues as required. With regard to partial plant closure, UNIDO indicated that while some other manufacturers of diclofenac sodium purchased the intermediate chemical, the production of which requires CTC (and thus closed down that part of the production process which consumed CTC), Amoli required a reliable supply of the intermediate chemical which could not be provided from sources in India. The overseas produced intermediate chemical was too costly.

9. There are no policy issues. UNIDO provided a revised current cost for cyclohexane and incremental operation costs were recalculated accordingly. A number of cost issues which affect incremental capital costs still remained under discussion at the time of preparation of this document. The Sub-Committee on project review will be advised of the outcome of the discussions.

# PROJECT EVALUATION SHEET
# INDIA

SECTOR: Refrigeration ODS use in sector (2000): 2,297 ODP tonnes

Sub-sector cost-effectiveness thresholds: Commercial 15.21 US $/kg
Domestic 13.76 US $/kg

***Project Titles***:

(a) Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Ice-Make Refrigeration
(b) Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Konark Refrigeration Appliances P. Ltd.
(c) Conversion from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at fourteen enterprises
(d) Conversion from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at nine enterprises

| **Project Data** | **Commercial/Domestic** | | | |
|---|---|---|---|---|
| | **Ice-Make** | **Konark** | **Fourteen enterprises** | **Nine enterprises** |
| Enterprise consumption (ODP tonnes) | 13.05 | 13.76 | 71.93 | 59.35 |
| Project impact (ODP tonnes) | 12.37 | 13.07 | 68.01 | 56.54 |
| Project duration (months) | 30 | 30 | 36 | 36 |
| Initial amount requested (US $) | 171,055 | 188,253 | 961,025 | 726,448 |
| Final project cost (US $): | | | | |
| Incremental capital cost (a) | 78,000 | 119,500 | 742,000 | 477,000 |
| Contingency cost (b) | 7,800 | 11,950 | 74,200 | 47,700 |
| Incremental operating cost (c) | 71,505 | 74,034 | 241,636 | 207,248 |
| Total project cost (a+b+c) | 157,305 | 205,484 | 1,057,836 | 731,948 |
| Local ownership (%) | 100% | 100% | 100% | 100% |
| Export component (%) | 0% | 0% | 0% | 0% |
| **Amount requested (US $)** | 157,305 | 182,684 | 960,097 | 726,448 |
| Cost effectiveness (US $/kg.) | 12.72 | 13.98 | 15.21 | 12.85 |
| Counterpart funding confirmed? | Yes | Yes | Yes | Yes |
| National coordinating agency | Ministry of Environment & Forests | | | |
| Implementing agency | UNDP | | | |

| ***Secretariat's Recommendations*** | | | | |
|---|---|---|---|---|
| Amount recommended (US $) | 157,305 | 182,684 | 960,097 | 726,448 |
| Project impact (ODP tonnes) | 12.37 | 13.07 | 68.01 | 56.54 |
| Cost effectiveness (US $/kg) | 12.72 | 13.98 | 14.11 | 12.85 |
| Implementing agency support cost (US $) | 20,450 | 23,749 | 115,611 | 89,909 |
| Total cost to Multilateral Fund (US $) | 177,755 | 206,433 | 1,075,708 | 816,357 |

## PROJECT DESCRIPTION

Sector Background

| | |
|---|---|
| Latest available total ODS consumption (1999) | 20,903.40 ODP tonnes |
| Baseline consumption of Annex A Group I substances (CFCs) | 6,681.00 ODP tonnes |
| Consumption of Annex A Group I substances for the year 1999 | 4,142.90 ODP tonnes |
| Baseline consumption of CFCs in refrigeration sector | 2,770.50 ODP tonnes |
| Consumption of CFCs in refrigeration sector in 2000 | 2,297.33 ODP tonnes |
| Funds approved for investment projects in refrigeration sector as of end of 2000 | US $22,993,031.00 |
| Quantity of CFC to be phased out in investment projects in refrigeration sector as of end of 2000 | 2,216.60 ODP tonnes |

10. The total ODS consumption in the refrigeration sector for the year 2000, according to the Government of India, was 2,297.33 ODP tonnes, including 690.33 ODP tonnes used for manufacturing new equipment and 1,607 ODP tonnes used for servicing.

11. The Executive Committee has approved about US $22,993,031 for 41 projects to phase out 2,216.6 ODP tonnes of CFC for enterprises manufacturing refrigeration equipment in India.

12. Four commercial refrigeration projects covering 25 enterprises with similar backgrounds have been submitted by the UNDP for consideration at the 35$^{th}$ Meeting of the Executive Committee.

13. The enterprises consume 116.72 ODP tonnes of CFC-11 and 41.37 ODP tonnes of CFC-12 (in 2000) in the manufacture of commercial refrigeration equipment. All of the enterprises manufacture similar equipment (chest freezers, display cabinets and bottle coolers) and employ manual mixing methods for foam operations in the baseline, with the exception of Konark, where a low-pressure foam dispenser is used. In addition, the enterprises utilize assorted foaming moulds and jigs, production and portable refrigerant charging machines, vacuum pumps and leak detectors.

14. The total phase out of 158.09 ODP tonnes of CFC-11 and CFC-12 will be achieved by converting CFC-11 based technology to HCFC-141b as the foam blowing agent, and CFC-12 to HFC-134a as the refrigerant. Under the current projects, 23 enterprises will replace hand-mixing operations by medium-pressure dispensers (with enterprise contribution to account for baseline condition). In addition, Ice-Make will replace hand-mixing operations by a high-pressure foam dispenser (with enterprise contribution) and a high-pressure dispenser will replace the existing low-pressure foaming machine at Konark. All enterprises will require provision of industrial or portable charging units, new vacuum pumps and retrofitting of existing vacuum pumps and leak detectors suitable for HFC-134a use. Other costs include re-design, testing, trials, technical assistance and training. Incremental operating costs are requested by the enterprises reflecting the higher cost of chemicals and an increase in foam density.

15. In accordance with decisions of the Executive Committee on the use of HCFCs, a letter of transmittal from the Government of India endorsing the use of HCFC-141b by the companies is attached.

## SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

### COMMENTS

16. Each project proposal includes a request for technical assistance and training (for both foam and refrigerant parts), which amounts to US $ 20,000 in two of the projects (Ice Make and Konark) and US $5,000 per enterprise in the two umbrella projects for 9 and 14 enterprises. The Secretariat requested explanations from UNDP regarding high costs of the project component. UNDP provided a breakdown of technical assistance and training costs. These costs are primarily associated with the services of international and local consultants.

17. Similarly, there is a difference in costs of trials between projects for individual enterprises (US $10,000 per enterprise) and umbrella projects (US $5,000 per enterprise). The Secretariat has requested detailed breakdown of costs of trials from UNDP. The information provided by UNDP in this regard indicated that some of the components included in the cost of trials constitute elements of capital cost which may or may not be eligible for funding.

18. The Secretariat discussed these issues with UNDP and agreed to eliminate cost components that are not associated with technical assistance, trials and testing, and to retain the cost components that are needed for the implementation of the projects.

### RECOMMENDATIONS

19. The Secretariat recommends blanket approval of the projects at the funding level indicated below.

| | Project Title | Project Funding (US$) | Support Cost (US$) | Implementing Agency |
|---|---|---|---|---|
| (a) | Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Ice-Make Refrigeration | 157,305 | 20,450 | UNDP |
| (b) | Conversion from CFC-11 to HCFC-141b technology and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at Konark Refrigeration Appliances P. Ltd. | 182,684 | 23,749 | UNDP |
| (c) | Conversion from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at fourteen enterprises | 960,097 | 115,611 | UNDP |
| (d) | Conversion from CFC-11 to HCFC-141b and from CFC-12 to HFC-134a technology in the manufacture of commercial refrigeration equipment at nine enterprises | 726,448 | 89,909 | UNDP |

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# GOVERNMENT NOTE OF TRANSMITTAL OF INVESTMENT PROJECTS TO THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

## PROJECT(S) OF THE GOVERNMENT OF INDIA

The Government of India requests UNDP to submit the project(s) listed in Table 1 below to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol for consideration at its 35th Meeting.

## Section I: ODS Consumption Data

4. The ODS consumption figure(s) of the project(s) has / have been validated by the National Ozone Unit (NOU).

5. The consumption data have been retained in the records of the NOU for reference and/or future verification.

6. The Government has been advised by the NOU that the agreement to the project(s) indicates a commitment to ensure that the validated phase-out figure(s) was / were realized and yielded a sustained reduction from the 2000 consumption of 2898 ODP tonnes for the foam sector and consumption of 2297.33 ODP tonnes for the refrigeration sector.

**Table 1: Projects Submitted to the 35th Meeting of the Executive Committee**

| No | Name of Recipient Enterprise | Sector/ Sub-Sector | ODS phaseout (ODP-MT) | Grant Requested (US$) | Implementing Agency |
|---|---|---|---|---|---|
| 1 | Group Project of Nine Commercial Refrigeration equipment manufacturers.<br>1. Amardeep Refrigeration<br>2. Gujarat Refrigeration Ind.<br>3. JS Enterprises<br>4. Manibhadra Ind.<br>5. Perfect Engineers<br>6. Rajni Refrigeration<br>7. Razvi Refrigeration<br>8. Regal Refrigeration<br>9. Snow Craft | RAC | 56.54 | 816,357 | UNDP |
| 2 | Group Projects of Fourteen Commercial Refrigeration equipment manufacturers.<br>1. Air Cool Engineering<br>2. Benson Refrigeration<br>3. Dhiman Frost<br>4. Himcool Industries<br>5. Lucky Diamond Ref.<br>6. New Moon Enterpries | RAC | 68.01 | 1,076,738 | - Do - |

| | | | | | |
|---|---|---|---|---|---|
| | 7. Nova Refrigeration Ind.<br>8. Pauly Refrigeration Works<br>9. RK Industries<br>10. Sangam Industries<br>11. Snoline Aircon<br>12. Snow Tech Enterprises<br>13. Verma Refrigeation<br>14. Waves Deep Freezer Co. | | | | |
| 3. | ICE Make Refrigeration | RAC | 12.37 | 193,292 | - DO - |
| 4. | Konark Refrigeration Appliances | RAC | 13.07 | 212,726 | - DO - |

**Section II: Other Relevant Actions Arising from Decision 33/2**

7. It is understood that, in accordance with the relevant guidelines, the funding received for a project would be partly or fully returned to the Multilateral Fund in cases where technology was changed during implementation of the project without informing the Fund Secretariat and without approval by the Executive Committee;

8. The National Ozone Unit undertakes to monitor closely, in cooperation with customs authorities and the environmental protection authorities, the importation and use of CFCs and to combine this monitoring with occasional unscheduled visits to importers and recipient manufacturing companies to check invoices and storage areas for unauthorized use of CFCs.

9. The National Ozone Unit will cooperate with the relevant implementing agencies to conduct safety inspections where applicable and keep reports on incidences of fires resulting from conversion projects.

**Section III: Projects Requiring the Use of HCFCs for Conversion** *(To be included where applicable)*

10. In line with Decision 27/13 of the Executive Committee and in recognition of Article 2F of the Montreal Protocol, the Government

(a) has reviewed the specific situations involved with the project(s) *(insert names of enterprises)* as well as its HCFC commitments under Article 2F; and

(b) has nonetheless determined that, at the present time, the projects needed to use HCFCs for an interim period with the understanding that no funding would be available for the future conversion from HCFCs for the company/companies involved.

Name: Usha Chandrasekhar
Designation: Director (Ozone Cell)
Telephone: 91-11-4642176
Fax: 91-11-4642175
E-mail: ozone@del3.vsnl.net.in

Date: 5th October, 2001