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Executive Committee of  
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Implementation of the Montreal Protocol

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**PROJECT PROPOSALS: TUNISIA**

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

Aerosol

- Phasing out CFCs at Jasminal Laboratories UNIDO
- Phasing out CFCs at Satem Parfums et Produits Cosmetiques UNIDO

Foam

- Phasing out CFC-11 at Meublatex UNIDO

**PROJECT EVALUATION SHEET  
TUNISIA**

SECTOR: **AEROSOL** ODS use in sector (1994): 180.3 ODP tonnes

Sector cost-effectiveness thresholds: US \$4.4/kg

**Project Titles:**

- (a) Phasing out CFCs at Jasminal Laboratories
- (b) Phasing out CFCs at Satem Parfums et Produits Cosmetiques.

| Project Data                        | Aerosols                                              |                                       |
|-------------------------------------|-------------------------------------------------------|---------------------------------------|
|                                     | Jasminal Laboratories                                 | Satem Parfums et Produits Cosmetiques |
| ODS phase-out (ODP tonnes)          | 86                                                    | 29                                    |
| Proposed project duration (Yrs)     | 1.5                                                   | 1.5                                   |
| Incremental capital cost (US\$)     | 337,000                                               | 221,500                               |
| Contingency (%)                     | 10                                                    | 10                                    |
| Incremental operational cost (US\$) | (127,00)                                              | (102,000)                             |
| Total project cost (US\$)           | 210,000                                               | 119,500                               |
| Local ownership (%)                 | 100                                                   | 100                                   |
| Export component (%)                | 0                                                     | 0                                     |
| Amount requested (US\$) {Original   | 231,895                                               | 97,048                                |
| {Revised                            | 210,000                                               | 119,500                               |
| Cost effectiveness (US\$/kg)        | 2.44                                                  | 4.12                                  |
| National Coordinating Agency        | National Agency for the Protection of the Environment |                                       |
| Implementing Agency                 | UNIDO                                                 | UNIDO                                 |
| Technical review completed?         | Yes                                                   | Yes                                   |

**Secretariat's Recommendations:**

|                                          |         |         |
|------------------------------------------|---------|---------|
| Amount recommended (US \$)               | 210,000 | 119,500 |
| Project impact (ODP tonnes)              | 86      | 29      |
| Cost effectiveness (US \$/kg)            | 2.44    | 4.12    |
| Implementing Agency support cost (US \$) | 27,300  | 15,535  |
| Total cost to Multilateral Fund (US \$)  | 237,300 | 135,035 |

### PROJECT DESCRIPTION

1. Jasminal Laboratories and Satem Parfums are among the main aerosol manufacturing enterprises in the country. Jasminal produces different size presentations of deodorants (360,000 cans/year), hair spays (25,000 cans/year), air fresheners (40,000 cans/year) and insecticides (170,000 cans/year). Satem Parfums produces only different size presentations of deodorants (352,500 cans/year), using its own formulations.
2. The present aerosol filling lines consists of semi-automatic Pamasol filling machines, manual can loading table with conveyer system, manual placing of the valve, crimper and gas filler.
3. The enterprises will convert to HAPs technology, using the open air filling room method. Conversion to HAP technology entails installation of an open air filling station, including crimping, propellant handling and filling and a water bath for testing filled cans, conveyor system, explosion-proof lighting and ventilation system, HAP storage and purification system, and a fire control systems including a water reservoir, pumps, hoses and fire extinguishers.
4. Technical assistance will be provided for performance and supervision of engineering designs, equipment installation and commissioning of the plant, training in production, quality control and safety procedures and production trials.
5. The enterprises will finance costs associated with land acquisition for gas storage and open air filling room, civil works including construction of the pump house and water storage tank, estimated at US \$670,000 for Jasminal and US \$470,000 for Satem Parfums.
6. The capital cost of conversion is US\$337,000 for Jasminal and US \$221,500 for Satem Parfums including 10% contingency. The operational savings (NPV) for four years are US \$127,000 for Jasminal and US \$102,000 for Satem Parfums.

### SECRETARIAT'S RECOMMENDATIONS

1. The Fund Secretariat recommends approval of the projects as follows:

| Project                                   | Project Cost<br>US \$ | Support Cost<br>US \$ | Implementing<br>Agency |
|-------------------------------------------|-----------------------|-----------------------|------------------------|
| Phasing out CFCs at Jasminal Laboratories | 210,000               | 27,300                | UNIDO                  |
| Phasing out CFCs at Satem Parfums         | 119,500               | 15,535                | UNIDO                  |

|                                           |                                |                         |
|-------------------------------------------|--------------------------------|-------------------------|
| SECTOR:                                   | FOAM ODS use in sector (1993): | 50 metric tonnes CFC-11 |
| Sub-sector cost-effectiveness thresholds: | General Foam                   | US \$9.53/kg            |

## Phasing out CFC-11 at Meublatex

| <i>Secretariat's Recommendations</i>    |         |
|-----------------------------------------|---------|
| Amount recommended (US \$)              | 105,000 |
| Project impact (ODP tonnes)             | 28      |
| Cost effectiveness (US \$/kg)           | 3.39    |
| Implementing Agency support cost (US\$) | 13,650  |
| Total cost to Multilateral Fund         | 118,650 |

## PROJECT DESCRIPTION

### Phasing out CFC-11 at Meublatex

1. Meublatex produces 500 tonnes of polyurethane foam products per annum which accounts for 80 per cent of the Tunisian market. The range of products includes wood imitation products for furniture (integral skin foam), high resilience HR) cold cure flexible molded polyurethane foam for office chair seats and backs and semi-flexible integral skin foam parts for furniture arm rests and pedestals.
2. Meublatex proposes to replace 31 ODP tonnes CFC-11 with 28 ODP tonnes HCFC-141b for its new foam formulation.
3. The company has four production lines, two of which already run on high pressure machines (wood imitations and larger HR flexible foam products). The company intends to replace its two low pressure machines used to produce smaller HR flexible foam and integral skin semi-flexible foam for arm rests and pedestals with one high pressure machine.

### Justification for use of HCFC

4. The company considered two most appropriate technologies currently available, i.e. n-pentane and HCFC-141b and to conclusion based on several factors that HCFC-141b would be the most appropriate option. The considerations influencing the selection of HCFC-141b included the following:
  - (a) Since the production programme of Meublatex as the largest furniture company in the country require a lot of flammable materials (e.g. wood, textile, solvents, varnishes, etc.) application of n-pentane at the foam section will require expensive safety precautions through the whole factory;
  - (b) Usage even of relatively small quantity of n-pentane at the section of semi-flexible foam manufacturing will require expensive safety arrangements at the foaming area and n-pentane storage system;
  - (c) Preblended HCFC-141b/polyol is available on the market; therefore new premixing station is not required.
  - (d) Storage, handling and use of HCFC-141b systems in integral skin semi-flexible polyurethane foam production is now well established in Tunisia.

## SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

### COMMENTS

1. In reviewing the project account was taken of the potential for using the existing low pressure machines for the new formulations using HCFC-141b as blowing agents. Several factors were considered in selecting the equipment, including possible use of high pressure machines in subsequent conversion to zero ODP technology, the costs and efficiency of technology transfer and training involved in conversion with the existing low pressure machines, especially since the company has procured some high pressure machines on its own, and maintenance of product quality. It was considered more cost-effective to replace the two machines with one high pressure machine. The recommended project cost took account of increasingly more competitive equipment market, the residual value of the machines to be replaced, the possible reduction in production costs as well as increase in efficiency engendered by the removal of the necessity for solvent flushing. The savings from solvent flushing and production efficiency were offset against incremental operating costs which were not claimed.

2. The following are the project costs based on the above analysis:

|                                  |              |                |
|----------------------------------|--------------|----------------|
| Technology transfer and training | US \$        | 10,000         |
| Trials                           |              | 10,000         |
| High pressure dispenser          |              | 75,000         |
| Commissioning                    |              | 10,000         |
| <b>TOTAL</b>                     | <b>US \$</b> | <b>105,000</b> |

### RECOMMENDATIONS

1. The Fund Secretariat recommends approval of the project with the associated support cost at the funding level shown below.

|                                 | Project Cost<br>US \$ | Support Cost<br>US \$ | Cost Effectiveness<br>US \$/kg. |
|---------------------------------|-----------------------|-----------------------|---------------------------------|
| Phasing out CFC-11 at Meublatex | 95,000                | 12,350                | 3.39                            |