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Executive Committee of  
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**PROJECT PROPOSALS: PHILIPPINES**

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

Refrigeration

- Umbrella project covering 5 companies for conversion from CFC-11 used as foam blowing agent into HCFC-141b, and CFC-12 and R-502 used as refrigerant into HFC-134a and HFC-404a (Gomeco, Chee Puck, Well Built, Low Temp Corporation, Allied Metals) UNDP
- Elimination of CFC-12 in the manufacture of household refrigerators in the Philippines World Bank

Solvent

- Elimination of the use of CFC-113, 1,1,1 trichloroethane (TCA), CFC-11 and CFC-12 at multiple corporations that manufacture special formulations for various industrial markets UNDP

## PROJECT EVALUATION SHEET PHILIPPINES

SECTOR: REFRIGERATION ODS use in sector (1991): 131 ODP tonnes

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

**Project Titles:**

Umbrella project covering 5 companies for conversion from CFC-11 used as foam blowing agent into HCFC-131b, and CFC-12 and R-502 used as refrigerant into HFC-134a and HFC-404a (Gomeco, Chee Puck, Well built, Low Temp corporation, Allied Metals

| Project Data                        | Commercial refrigeration |
|-------------------------------------|--------------------------|
|                                     | Umbrella                 |
| ODS phase-out (ODP tonnes)          | 32.8                     |
| Proposed project duration (Yrs)     | 2                        |
| Incremental capital cost (US\$)     | 359,000                  |
| Contingency (%)                     | 10                       |
| Incremental operational cost (US\$) | 0                        |
| Total project cost (US\$)           | 312,400                  |
| Local ownership (%)                 | 100                      |
| Export component (%)                | 0                        |
| Amount requested (US\$) { Original  | 312,400                  |
| { Revised                           |                          |
| Cost effectiveness (US\$/kg)        | 9.51                     |
| National Coordinating Agency        | DENP                     |
| Implementing Agency                 | UNDP                     |
| Technical review completed?         | Yes                      |

| <b>Secretariat's Recommendations</b>    |     |
|-----------------------------------------|-----|
| Amount recommended (US \$)              | N/A |
| Project impact (ODP tonnes)             | N/A |
| Cost effectiveness (US \$/kg)           | N/A |
| Implementing Agency support cost (US\$) | N/A |
| Total cost to Multilateral Fund         | N/A |

### PROJECT DESCRIPTION

Umbrella project covering 5 companies for conversion from CFC-11 used as foam blowing agent into HCFC-131b, and CFC-12 and R-502 used as refrigerant into HFC-134a and HFC-404a (Gomeco, Chee Puck, Well built, Low Temp corporation, Allied Metals

1. The commercial refrigeration sub-sector in the Philippines comprises a number of small and medium sized enterprises. This project combines five commercial refrigeration factories under an umbrella project to phase out the use of 32.8 ODP tonnes.
2. Gomeco consumes 22.58 tonnes of CFC (11 and 12) and 0.27 tonnes of R-502. The remaining enterprises consume from 0.76 tonnes - 4 tonnes of CFCs and 0.08 tonnes to 0.23 tonnes of R-502.
3. Baseline equipment in the five enterprises are rudimentary. Thus, all foaming operation is done manually, all refrigerant charging is done by means of vacuum pumps, pressure gauges and scales, and leaks are detected by means of soap and water.
4. The project seeks to provide foam dispensing equipment, and charging stations and electronic leak detectors to each of the five enterprises in order to switch over to HCFC-141b and HFC-134a.
5. The project is not claiming operating costs.

## **SECRETARIAT'S COMMENTS AND RECOMMENDATIONS**

### **COMMENTS**

1. The overall cost-effectiveness of the umbrella project does not exceed the established threshold. However, the cost-effectiveness of individual enterprises varies from US \$7/kg ODP to US \$40/kg. ODP. The issue of cost-effectiveness of umbrella projects is discussed in the Secretariat's paper on cost-effectiveness threshold and umbrella projects (UNEP/OzL.Pro/ExCom/19/55/Rev.1).
2. As indicated under project description (paragraph 3), the baseline equipment in all five companies is rudimentary. However, the project seeks to provide each enterprise with new foaming machines, evacuation and charging equipment, and electronic leak detectors, which amounts to a substantial technological upgrade.
3. In addition, the project incorporates a recovery/recycling component providing equipment to each of the five companies. A programme for recovery and recycling in the refrigeration sector in Metro Manila which accounts for approximately 45 per cent of national sales of refrigeration equipment, was submitted by UNIDO to the 19th Meeting of the Executive Committee (subsequently withdrawn).
4. It is to be noted that the five enterprises are considered as small and medium sized enterprises which are characterized by very low level of baseline equipment and technology. Therefore, provision of even the most basic equipment to such enterprises will constitute a large technological upgrade.
5. If the technological upgrades to each enterprise, are quantified and offset against requested cost, the resulting grant would amount to very little.
6. The Fund Secretariat has informed UNDP of the impact of the value of technological upgrade on the overall cost of the project, and subsequently proposed that UNDP prepare a project to demonstrate the conversion technologies, in a government institute, for the benefit of these enterprises and possibly others in the same subsector.

### **RECOMMENDATIONS**

1. It is recommended that the Executive Committee may wish to disapprove the project and request UNDP to develop a demonstration project for the most cost-effective approach for ODS phase-out as a technical assistance for small commercial refrigeration enterprises which have no or simple baseline equipment.

# **PROJECT EVALUATION SHEET** **PHILIPPINES**

SECTOR: **REFRIGERATION**

ODS use in sector: (1993) 290 ODP tonnes

Sub-sector cost-effectiveness thresholds: Domestic refrigeration: US \$13.76/kg

**Project Title:**

Elimination of CFC-12 in the manufacture of household refrigerators in the Philippines

| Project Data                                   | DOMESTIC REFRIGERATION |            |            |                   | TOTAL              |
|------------------------------------------------|------------------------|------------|------------|-------------------|--------------------|
|                                                | Philacor               | Concepcion | Sanyo      | Trans-Union Corp. |                    |
| ODS phase-out (ODP tonnes)                     | 64.8                   | 16.2       | 8.72       | 2.2               | 91.92              |
| Proposed Project Duration (Yrs)                | 1                      | 1          | 1          | 1                 |                    |
| Incremental capital cost (US \$)               | 742,000                | 569,748    | 281,761    | 453,700           |                    |
| Contingency (%)                                | -                      | -          | -          | -                 |                    |
| Incremental operational cost (US \$)           | 1,145,000              | 378,950    | 93,362     | 31,980            |                    |
| Total project cost (US \$)                     | 1,887,000              | 948,698    | 375,123    | 485,680           |                    |
| Local Ownership (%)                            | 61                     | 100        |            | 100               |                    |
| Export component (%)                           | 0                      | 0          |            | 0                 |                    |
| Amount requested (US \$) {Original<br>{Revised | 890,000                | 400,000    | 150,000    | 140,000           | 1,533,981          |
| Cost Effectiveness (US \$/kg)                  |                        |            |            |                   | 13.76 <sup>1</sup> |
| National Coordinating Agency                   |                        | DENR       |            |                   |                    |
| Implementing Agency                            | World Bank             | World Bank | World Bank | World Bank        |                    |
| Technical Review Completed?                    | Yes                    | Yes        | Yes        | Yes               |                    |

| <i>Secretariat's Recommendations</i>     |         |         |         |         |           |
|------------------------------------------|---------|---------|---------|---------|-----------|
| Amount recommended (US \$)               | 643,700 | 347,300 | 108,600 | 101,300 | 1,200,900 |
| Project Impact (ODP tonnes) <sup>2</sup> | 64.8    | 16.2    | 8.72    | 2.2     | 91.92     |
| Cost effectiveness (US \$/kg)            | 8.49    | 19.53   | 35.15   | 128.5   | 13.70     |
| Impl. Agency Support Cost (US \$)        |         |         |         |         | 156,117   |
| Total Cost to Multilateral Fund          |         |         |         |         | 1,357,017 |

<sup>1</sup> See Secretariat's comments

<sup>2</sup> Cost-effectiveness is calculated on the basis of combining the incremental costs of the approved foam project (9th Meeting) and those requested for the refrigerant part in the current project, and the total ODS to be phased out by the two projects

## **PROJECT DESCRIPTION**

1. This proposal for the conversion of the refrigerant component for four household refrigerator manufacturers in the Philippines was first submitted to the 18th Meeting.
2. The proposal is to convert to HFC-134a refrigerant based technology which involves the replacement of charging equipment and leak detectors and retrofitting of existing vacuum systems, model redesign, procurement of testing equipment and training.
3. The conversion of the foam component in each of the four enterprises was approved at the 9th Meeting. The total amount approved at that meeting was US \$3.87 million for conversion from CFC-11 to HCFC-22/HCFC-142 blend. However, all four companies eventually chose conversion to HCFC-141b for the total phase out of 271 ODP tonnes (after accounting for the residual ODP of HCFC-141b).

## SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

### COMMENTS

1. The Bank reported that if the grant effectiveness threshold, adopted at the 16th Executive Committee Meeting, were applied individually to each project only one project component for Philacor Company, the largest in the sector, would be qualified as eligible for funding. Cost-effectiveness of the three other projects would be much higher than the threshold value approved for domestic refrigeration sector.
2. The following Table 1 provides information on the grant requests for each of the four enterprises, allocations approved for foam conversion component for the same enterprises, ODS phase-out and calculated cost-effectiveness.

TABLE 1

|               | Foam<br>Conversion<br>Allocation<br>Approved<br>US \$,000 | Refrigerant<br>Conversion<br>Requested<br>US \$,000 | Total Foam and<br>Refrigerant<br>Components<br>US \$,000 | Total ODP<br>Tonnes<br>Phaseout | Cost-<br>Effectiveness<br>US \$/kg ODP |
|---------------|-----------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------|---------------------------------|----------------------------------------|
| Philacor      | 1716.9                                                    | 643.7                                               | 2,360.6                                                  | 278.0                           | 8.49                                   |
| Concepcion    | 766.3                                                     | 347.3                                               | 1,113.6                                                  | 57.0                            | 19.53                                  |
| Trans-Union   | 746.9                                                     | 101.3                                               | 848.2                                                    | 6.6                             | 128.5                                  |
| Sanyo         | 640.2                                                     | 108.6                                               | 748.8                                                    | 21.3                            | 35.15                                  |
| <b>TOTAL:</b> | <b>3,870</b>                                              | <b>1,200.9</b>                                      | <b>5,071.2</b>                                           | <b>362.9</b>                    | <b>13.70</b>                           |

3. The issue of cost-effectiveness and umbrella projects is addressed in the discussion paper prepared by the Secretariat which is going to be discussed under agenda item 12.
4. While approving the allocations for the foam component at the 9th Meeting, the Executive Committee decided that the several issues related to the eligibility and cost of certain project components should be addressed at the appraisal stage. The Secretariat received clarification from the World Bank on some of these issues. Two issues still remain to be addressed. These are the high cost of foaming equipment such as jigs and foaming machines and eligibility of equipment, which will not be necessary for conversion (pilot lines, jigs, metering, and mixing equipment, high pressure storage). According to information provided by the World Bank, about US \$2 million originally approved was reallocated to other eligible expenses, however, the Secretariat received no detailed information about these expenses and their eligibility under the Fund's rules, and, thus, cannot report on them. US \$76,000 was reported as savings and has been returned to the Fund.
5. The Secretariat has not received any additional information regarding the issue since the 18th Meeting of the Executive Committee.

**RECOMMENDATIONS**

1. It is recommended that the Executive Committee request the World Bank to prepare a report for the 20th Meeting of the Executive Committee on implementation of the project approved at the 9th Meeting for conversion of the foam part of refrigerator manufacture by the same enterprises. The report should address the issues raised in paragraph (9) of document UNEP/OzL.Pro/ExCom/9/16/Add.1 and in CRP2 tabled at the 18th Meeting. In particular it should provide detailed information on the change of technology and consequent reallocation of major areas of expenditure, so that the Executive Committee may be informed as to eligibility and the reasonableness of costs.

2. It is further recommended that the Executive Committee consider this project in the context of any decision taken on guidelines and criteria for umbrella projects, and approve it, if appropriate at the value indicated below:

|                                                                                        | Project Cost<br>US \$ | Support Cost<br>US \$ | Implementing<br>Agency |
|----------------------------------------------------------------------------------------|-----------------------|-----------------------|------------------------|
| Elimination of CFC-12 in the manufacture of household refrigerators in the Philippines | 1,200,900             | 156,117               | World Bank             |

## PROJECT EVALUATION SHEET PHILIPPINES

SECTOR: SOLVENT ODS use in sector (1991): 458 ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A US \$/kg  
N/A US \$/kg

**Project Title:**

Elimination of the use of CFC-113, 1,1,1-trichloroethane (TCA), CFC-11 and CFC-12 at multiple corporations that manufacture special formulations for various industrial markets.

| Project Data                         |                                                         |
|--------------------------------------|---------------------------------------------------------|
| ODS phase-out (ODP tonnes)           | 53.6*                                                   |
| Proposed project duration (Yrs)      | 1.5                                                     |
| Incremental capital cost (US \$)     | 691,000                                                 |
| Contingency (%)                      | 10                                                      |
| Incremental operational cost (US \$) | 134,000                                                 |
| Total project cost (US \$)           | 825,000                                                 |
| Local ownership (%)                  | 100                                                     |
| Export component (%)                 | -                                                       |
| Amount requested (US \$) {Original}  | 825,000                                                 |
| {Revised}                            | 825,000                                                 |
| Cost effectiveness (US \$/kg)        | N/A                                                     |
| National Coordinating Agency         | Department of Environment and Natural Resources, Manila |
| Implementing Agency                  | UNDP                                                    |
| Technical review completed?          | Yes                                                     |

| <i>Secretariat's Recommendations:</i>    |         |
|------------------------------------------|---------|
| Amount recommended (US \$)               | 492,800 |
| Project impact (ODP tonnes)              | 53.6*   |
| Cost effectiveness (US \$/kg)            | N/A     |
| Implementing Agency support cost (US \$) | 64,064  |
| Total cost to Multilateral Fund (US \$)  | 556,864 |

\* Implementation of the project does not guarantee phase-out, it enables phase-out to take place, provided other external factors such as customer acceptance and regulatory support are achieved.

## **PROJECT DESCRIPTION**

1. This project is intended to eliminate the use of CFC-113, CFC-12, CFC-11 and TCA at six enterprises that custom blend bulk products, for solvent cleaning. The products are re-sold to the industrial sector. The project also will eliminate the use of CFC-11 and CFC-12 in the aerosol filling of industrial cleaning and carrier fluids by the same enterprises. The companies are 100% locally owned. They package their proprietary custom blended products primarily in drums and pails for the electronics, food, janitorial and preventive maintenance industries, and fill aerosol formulations for electronics and maintenance uses in several industries.
2. The phase-out will be facilitated by installing ventilation and gas-detection equipment so that the enterprises are able to process alternative solvents which may be more hazardous or flammable.
3. It is proposed that quantities of new chemicals be provided to each enterprise so that the enterprises can provide samples of the proposed proprietary non-ODS solvent blends to their customers for qualification in the customer's specific application.
4. It is estimated that there are some 20 such solvent blenders in the Philippines. This project is intended to serve as a demonstration project for six of the enterprises, to be followed by a similar proposal for the remaining 14 enterprises.
5. The Government of the Philippines, through the Department of Environment and Natural resources has announced that a ban on the import of TCA and carbon tetrachloride will commence at the end of 1996, and that the import of CFC-113 will be banned in 1998. The Government will also undertake a publicity programme to support the six companies which are proposed to be converted in this project and to encourage the remaining 14 to take part in the planned second project.

## SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

### COMMENTS

1. This project addresses a new sub-sector, namely the blenders of solvent cleaning mixtures. The blenders supply to a very large number of small end-users. Hence converting the blenders will phase-out consumption by the end-user. There is no established cost-effectiveness threshold for a project of this nature. Additionally, while the project is intended to produce phase-out, phase-out is not guaranteed. The investment only facilitates a change to non-ODS solvents. The actual phase-out will only be achieved if the customers accept the new products. Thus, additional measures, such as the introduction of regulations and public awareness support, are proposed by the Government of the Philippines.
2. The Fund Secretariat considers that the ventilation and gas detection equipment proposed in the project is likely to be essential for virtually any of the non-ODS solvent mixtures decided upon by the enterprises. This element of the project is supported.
3. The second element of the project is provision of specialist technical support to develop new solvent mixtures, together with funding for acquisition of specific proprietary formulations. This is also supported.
4. The third element is provision of a quantity of new chemicals to each enterprise so that the enterprise can supply samples of the new mixture to clients for trials and qualification tests. Some of the new chemicals are extremely expensive, for instance, US \$12,500 for a 200 litre drum. The cost of chemicals proposed for each enterprise is US \$30,000 or a total of US \$180,000 for the project group of six enterprises. As it stands, this process would be repeated if a second proposal comes forward for a further 14 enterprises, to give a total of US \$600,000 for the supply of chemicals alone to phase out this sub-sector in the Philippines.
5. The Fund Secretariat has discussed the suggestion that some form of centralized qualification process should be developed, but this has not been accepted on the grounds that enterprises are competitive and each will need to 'qualify' its own proprietary mixture with its customers. The Fund Secretariat considers that costs of this magnitude do not represent an effective use of Fund resources and that further consideration should be given to developing an innovative solution involving common qualification procedures.
6. The fourth element is provision of incremental operating costs of US \$134,000 to cover the increased cost of solvent mixtures for a period of 4 months until the remainder of blenders are converted in the second project, after which customers will be asked to bear the costs. The incremental operating costs are dependent on chemical prices, and upon the quantities of individual chemicals in the blends eventually adopted. The Fund Secretariat considers that there is insufficient certainty in calculation of the level of cost for the amount to be approved. Additionally, if the whole sub-sector was addressed simultaneously, such costs would not be needed.

7. It is not appropriate to compare the apparent cost-effectiveness figure of 15.3 US \$/kg with established cost-effectiveness thresholds in the solvent sector (19.78 US \$/kg and 38.50 US \$/kg). Typical solvent projects are characterized by high costs for the more complex equipment usually needed to enable the use of non-ODS solvent in industrial processes. This project involves straightforward bulk mixing operations with little or no technological components.

## **RECOMMENDATIONS**

1. The Fund Secretariat recommends that:
  - (a) the project be re-examined to develop a more economical solution to trials and qualification of new solvent mixtures; or
  - (b) The project be approved now, on the basis of costs for capital equipment and technical support at a level of US \$492,800 plus 13% support cost of US \$64,064.