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PROJECT PROPOSAL: MEXICO

This document includes the following project proposal:

- Recovery of CFC-12 servicing of domestic refrigeration at Vitromatic
Comercial y Servicios Integrados UNDP

PROJECT COVER SHEET

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COUNTRY: Mexico

PROJECT TITLE: Recovery of CFC-12 in the servicing of domestic refrigeration at Vitromatic Comercial (VC) and at Servicios Integrados Fabriles (SIF).

SECTOR COVERED: Domestic Refrigeration

ODS USE IN SECTOR: 970 MT/year (based on 1993 figures)

PROJECT DURATION: 1.5 year

ECONOMIC LIFE: 5 years

	Total	VC	SIF
PROJECT IMPACT (ODP):	76 MT/yr	39 MT/Yr	37 MT/yr
TOTAL COST:	352,610 US\$	199,570 US\$	153,040 US\$
PROPOSED MLF GRANT:	352,610 US\$	199,570 US\$	153,040 US\$
UNIT ABATEMENT COST:	1.22 US\$/Kg	1.35 US\$/kg	1.09 US\$/kg

COORDINATING NATIONAL BODY: National Institute of Ecology (INE) (Ozone Protection Unit)

IMPLEMENTING AGENCY: UNDP

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The project is to implement a Programme for Recovery/Reclaiming of refrigerant in the domestic refrigeration sectors. The two holdings of domestic refrigerator manufacturers (VITRO and MABE) each have a service company (VC and SIF respectively) responsible for servicing domestic refrigerators. Each service company has its network of repair workshops throughout the country. Five training seminars for technicians performing repairs and maintenance on domestic refrigeration equipment will be held for each service company and their networks, to familiarize all involved with the recovery/reclaiming plan. Improved servicing techniques to avoid leaks of CFC will be an important part of the training provided during those seminars. The project will also provide recovery equipment to the respective networks of VC and SIF. Recovered material would be channeled to Quimobasicos in Monterrey, using its reclaiming unit which was provided through an already completed Multilateral Fund / World Bank project. A system for monitoring the quantities of CFC recovered through this project is planned to ensure the success of this recovery/reclaiming programme. This task will be carried out by a National Consultant supervised by INE.

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Project Prepared by: Mr. Robert Berkeley

PROJECT OF THE GOVERNMENT OF MEXICO

IMPLEMENTATION OF A PROGRAMME FOR RECOVERY OF REFRIGERANT DURING SERVICING OF DOMESTIC REFRIGERATION

1. PROJECT OBJECTIVE

The objective of the project is to implement a comprehensive programme for recovery of refrigerant during the servicing of domestic refrigerators by Vitromatic Comercial (VC) and by Servicios Integrados Fabriles (SIF). The CFC that is emptied from the refrigeration system to permit servicing and CFC used for cleaning the system will be recovered and reclaimed.

2. SECTOR BACKGROUND

Mexico's Country Programme (CP) for the reduction of Ozone Depleting Substances (ODS) was approved in February 1992.

For the year 1994 total CFC consumption for the domestic refrigeration sector is estimated to have been 970 MT (700 MT of CFC-11 and 270 MT of CFC-12), out of which approximately 90 MT were used for servicing.

It is estimated that about 1,080,000 domestic refrigerators were sold in the period July-1993 - June 1994, 85% of the official servicing of these refrigerators was carried out by two companies: Vitromatic Comercial (VC) and Servicios Integrados Fabriles (SIF). The project will eliminate the major part of ODS vented during domestic refrigeration servicing. More information on VC and SIF and their respective network of repair workshops is given in paragraph 3.

Quimobasicos in Monterrey through a Multilateral Fund / World Bank grant has set up a reclaiming center for CFC's. This facility at present is already processing CFC's from other subsectors than domestic refrigeration and other efforts are underway to expand the number of networks of CFC-users in Mexico that would use the Quimobasicos reclaiming facilities. This project will contribute to the success of the Quimobasicos project, since it will add to the quantity of CFC's that will be reclaimed in the future. Quimobasicos expressed their interest in the present project, and meetings were already held between Quimobasicos and VC / SIF to discuss about the modalities and conditions on how to get the CFC's from the VC and SIF networks to Quimobasicos. The results of these discussions were taken into account when writing this project.

3. ENTERPRISE BACKGROUND

	VC	SIF
Full Company Name:	Vitromatic Comercial, S.A. de C.V.	Servicios Integrados Fabriles S.A. de C.V.
Located in:	Av. San Nicolás 2121 Nte. Colonia 1° de Mayo, Monterrey, N.L. Mexico	Prol. Ingenieros Militares 156 col. San Lorenzo Tlaltenango, Mexico D.F.
Ownership:	100% Mexican	100% Mexican
Contact Person:	Mr. Sergio Mier	Ing. Jose Antonio Davila
Tel:	528-329.2121	525-227.1023
Fax:	528-329.2103	525-358.8312
N° of Official Service Workshops:	16	19
N° of Authorized Service Workshops:	333	252
N° of Service Work- shops considered in this project	151	114
Other information:	Vitromatic Comercial, was founded in 1987 and presently performs official after sales and warranty service for Acros, Whirlpool, Supermatic, Roper, Estate, Philips and Kenmore. These marks of refrigerators totaled 40% of sales on the Mexican Domestic Refrigerator Market at the end of 94.	Servicios Integrados Fabriles was founded in 1990 and presently performs official after sales and warranty service for General Electric, Mabe, Easy, Hot Point, Kelvinator, IEM. These marks of refri- gerators totaled 55% of sales on the Mexican Domestic Refrigerator market at the end of 94

A survey was undertaken during project preparation to define the two networks of repair workshops. It was found, for instance, that some workshops can be part of both the VC and the SIF networks. It was together with VC and SIF that the number of workshops was determined that would benefit from the project through either the VC or the SIF networks.

4. PROJECT DESCRIPTION

The project is to implement a comprehensive programme for recovery/reclaim of refrigerant CFC-12 in the domestic refrigeration service sector. Five training seminars for technicians performing repairs and maintenance on domestic refrigerators will be held to familiarize all involved with the Recovery/Reclaim programme. Improved servicing techniques to avoid

emissions during circuit cleaning will be an important part of the training provided during these seminars. The project will also provide recovery equipment and refrigerant collection bags and will coordinate with a nation wide collection and reclaim network based in Monterrey. A system for monitoring the quantities of CFC's recovered and reclaimed (with periodic evaluation) is planned to ensure the success of the programme. This task will be carried out by a National Consultant under supervision by INE's Ozone Protection Unit.

5. PROJECT JUSTIFICATION:

One of the highest priorities in the phaseout of the use of the CFC's in the refrigeration sector is to improve maintenance practice of technicians, repairing and servicing existing CFC installations and the recovery and storage of the refrigerant present in the installation while conducting repairs and servicing to avoid unnecessary losses and venting of CFC's. This project will disseminate this type of information.

The recovery/reclaim project constitutes of a nation wide programme which aims at phasing out CFC for the domestic refrigeration sector, and will result in the phase out of 76 MT of CFC per year (39 MT at VC, 37 MT at SIF). To insure its success, VC and SIF will cooperate in a comprehensive monitoring system to check on a periodic basis how much CFC's are being reclaimed by each of the recovery equipments provided through this project, in close collaboration with the above-mentioned National Consultant.

It is considered that 85% of the CFC recovered can be reclaimed.

6. PROJECT ACTIVITIES AND PROJECT COSTS.

6.1. INCREMENTAL CAPITAL COSTS.

6.1.1. Demonstration seminars on the recovery of CFC's and good maintenance practices.

Two times five demonstration seminars will be held in five major cities, i.e. five for the CV network and five for the SIF network. Each seminar will be of one day duration and will consist of an explanation on the need for recovery/reclaim, the presentation of recovery technologies and methodologies in different systems including domestic refrigeration, as well as good practice during servicing and maintenance.

It should be also noted that the seminars will utilize (among other materials) some of the existing training documentation and material prepared for previous seminars as well as material prepared by UNEP.

FIVE DEMONSTRATIONS SEMINARS	US\$
=====	=====
1 International Consultant/lecturer	10 000
Logistical Arrangements for seminar	14 000
Duplication of technical literature	1 000
Lecture Materials	2 000
=====	=====
Total	27 000
For BOTH networks (VC and SIF)	54,000

6.1.2. Recovery Programme.

Supply of recovery equipment to VC's and SIF's Official Service Centers and Authorized Service Workshops throughout Mexico.

VC has 16 official service centers and 333 authorized service workshops covering the whole of Mexico. SIF has 19 official service centers and 252 authorized service workshops covering the whole of Mexico.

The aim of the project is to supply the 16 official and 135 of the authorized service centers for VC, as well as the 19 official and 95 of the authorized service centers for SIF, with recovery equipment. Each of these selected centers would also be supplied with five refrigerant recovery bags to be used by engineers during house calls and smaller service workshops near by. These bags would be down loaded into cylinders with the use of the recovery equipment which will be based in the workshop to recover from equipment serviced there. As the basic service is to domestic refrigeration, the recovery equipment chosen must be portable, not more than 15 Kg weight, and need not have a capacity of more than 2 lb/min. Many of the authorized centers also service and repair other refrigeration systems for this reason 35 of them will be supplied with larger recovery equipment (4 lb/min) to permit the recover of CFC from comercial and air conditioning systems.

CFC-12 Recovery Equipment	Qty	VC US\$	Qty	SIF US\$
=====	=====	=====	=====	=====
Number of Service Workshops	151		114	
=====	=====	=====	=====	=====
Small capacity machines	116	52 200	111	49,950
Medium Capacity machines	35	29 750	7	5,950
Weighing Scales	151	11 325	114	8,850
Recovery Bags	755	18 875	590	14,750
Refrigerant Hoses with manual shut off valve	302	7 550	236	5,900
Maintenance and Spares		15 000		11,000
Freight Costs		15 000		11,000
Contingencies (10% of the above)		14 970		10,740
=====	=====	=====	=====	=====
Total		164 670		118,140

6.1.3. Reclaiming programme.

An agreement has been drawn with Quimobásicos, S.A. de C.V. that the recovered refrigerant will be collected by their distribution network and delivered to their plant in Monterrey where it will be reclaimed. Quimobásicos will supply the necessary recovery cylinders free of charge and will give a bonification in the form of a discount of 14% on the price of new refrigerant of the equivalent amount reclaimed. Owing to the fact that in practice only about 85% of recovered CFC is suitable for reclaim this bonification will not result in a profit for the service stations especial if the extra man hours entailed in the recovery process are taken into account (see also para 6.2).

6.1.4. Monitoring system.

As all recovered refrigerant will have to be reclaimed. Quimobásicos will keep a record of the amount presented for reclaim by each service center. This will be evaluated on a regular basis by the National Consultant who would work under supervision by INE's Ozone Protection Unit.

During the first month, the consultant would have to set up a computer database to monitor the information received from the service centers. He would probably work half-time during that period. For a remaining period of 11 months (see workplan in paragraph 8 for timing), 4 hours per week to keep the data up to date and produce monthly reports should be sufficient.

	US\$
=====	
1 National Consultant	
first month	4,000
remaining eleven months	8,800
1 computer and software	3,000
=====	
Total	15,800

6.5. Total Capital Cost.

The capital cost corresponds to the total of paragraph 6.1 through 6.4 and amounts to (US\$)

TOTAL	VC	SIF
=====		
352,610	199,570	153,040

6.2. INCREMENTAL OPERATIONAL COSTS

As discussed in paragraph 6.1.2. there will be some operational savings which will result from the fact that new CFC's will be obtained from Quimobasicos at reduced prices. On the other hand, there will be operational costs related to the :

- additional labour cost needed to recover the gases
- longer time needed to service refrigerators will often cause loss of revenues as less units can be serviced compared to the past.

It is estimated that the savings will be equal to the costs, so that no operational costs/savings are included in the project.

6.3. THE UNIT ABATEMENT COST

The calculation for VC is as follows:

a) Incremental capital cost	199,570 US\$
b) Project Economic Life Time	5 years
c) Incremental Recurrent Costs	Nil
d) CFC Consumption	39 MT/year
e) Capital Recovery Factor (5 years)	0.2638

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UNIT ABATEMENT COST (axe+c)/d.	1.35 US\$/Kg
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A similar calculation for SIF results in a unit abatement cost of 1.09 US\$/kg.

The overall project with the two companies combined has a unit abatement cost of 1.22 US\$/kg.

7. FINANCING PLAN

The two Companies request reimbursement to the amount of the project costs of US\$ 352,610.

8. PROJECT IMPLEMENTATION

8.1 MANAGEMENT

UNDP will oversee the successful implementation of this project, and will provide technical assistance during project execution.

8.2 SCHEDULE

TASK	TIME TO COMPLETION					
	Q1	Q2	Q3	Q4	Q5	Q6
1. Preparation						
Approval	x					
Procurement preparation	xx	x				
Arrival of the Equipment		xxx				
2. Demonstration Seminars			xxx			
3. Monitoring System			xxx	xxx	xxx	xxx
National Consultant			xxx	xxx	xxx	xxx

9. PROJECT IMPACT

This project will eliminate the use of 76 ODP MT per year. This data is based on data obtained from VC and SIF as to how much recovered material could be expected per year through this project through their respective networks of repair workshops.