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

Sixth Meeting
Montreal, 27-28 February 1992

EGYPT PROJECT PROPOSALS

This document consists of four project proposals from Egypt, and Project Evaluation Sheets prepared by The Fund Secretariat. These proposals are:

- (a) Conversion of Refrigerating Compressors to HFC 134a by MISR Compressors Manufacturing Co. (MCMC)
- (b) Recovery and Phasing-Out of ODSs in Foam Production in Taki Vita Co.
- (c) Technology Transfer and Using Non-ODS in Foam Production
- (d) Recycle and Waste Disposal.

61/92

**CONSULAT GÉNÉRAL DE
LA RÉPUBLIQUE ARABE D'ÉGYPTÉ**
3754 CÔTE DES NEIGES
MONTREAL, QUE. H3H 1V6

MONTREAL, FEBRUARY 5th. 1992

DR. OMAR EL ARINI

CHIEF OFFICER

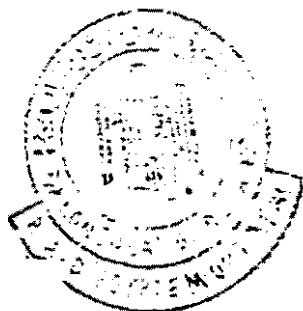
SECRETARIAT OF THE MULTILATERAL FUND FOR THE PROTECTION
OF THE O Z O N E LAYER

DEAR Dr. EL- ARINI ,

I HAVE THE HONOUR TO ENCLOSE HEREWITH A NOTE RECEIVED BY THIS
CONSULATE TODAY FROM THE MINISTRY OF FOREIGN AFFAIRS IN CAIRO CONTAINING THE
EGYPTIAN PROJECTS TO BE PRESENTED TO THE SIXTH MEETING OF THE EXECUTIVE COM-
MITTEE DUE TO BE HELD ON THE 27 - 28 OF THIS MONTH IN MONTREAL.

UPON INSTRUCTIONS FROM CAIRO, KINDLY SUBMIT THOSE PROJECTS TO
THE ABOVE MENTIONED MEETING AND ARRANGE THE DISTRIBUTION OF THIS DOCUMENT
TO ALL MEMBERS OF THE EXECUTIVE COMMITTEE TO OBTAIN FINANCING FOR THE
EGYPTIAN PROJECTS.

PLEASE ACCEPT MY HIGHEST CONSIDERATION.



CONSUL GENERAL

S. Sharara

SHERIF MAHMOUD SHARARA

PROJECT EVALUATION SHEET

COUNTRY OR REGION: EGYPT

PROJECT TITLE: Conversion of Refrigerating Compressors to HFC 134a by MISR Compressors Manufacturing Co. (MCMC)

BUDGET: US\$ 2,490,413

INCREMENTAL COSTS: US\$ 2,490,413

*COST EFFECTIVENESS: \$ 7.1 per Kg. ODP Saved Annually

PROJECT TIMEFRAME: START 1992 END 1994

TECHNICAL REVIEW COMPLETED: YES ☒ NO ☐

SECRETARIAT'S COMMENTS

The project document was well prepared and provided The Secretariat with most of the information required to conduct a complete review of the evaluation. A technical review was also completed for the Secretariat by an outside consultant.

The Secretariat has determined that the project is technically sound, cost-effective, and will result in an accelerated phase-out of CFC-12 using the substitute HFC 134a. It is estimated that the project will result in an average annual phase-out of 350 tonnes of CFC-12.

The project meets the requirements for funding under The Montreal Protocol while providing a cost-effective option for converting compressor production within the framework of the national ozone policy of Egypt. The incremental costs for this project are derived from those direct expenditures associated with the conversion from production of CFC-12 compressors to HFC 134a compressors. Moreover, the project meets the principle that the funding of full incremental costs is intended as an incentive for early adoption of ozone friendly technologies.

SECRETARIAT'S RECOMMENDATIONS

This project is recommended for funding in the amount of US \$ 2,490,413, representing the incremental costs for the conversion to the production of compressors using HFC 134a as a substitute for CFC-12.

* Determined as the ratio of incremental costs to the estimated annual saving of ODP (\$/ODP kg.).

MISR COMPRESSOR MANUFACTURING CO.
[MCMC]
S.A.E.

Cairo, Feb. 6th, 1992

COUNTRY OR REGION : EGYPT

CALCULATED ODS CONSUMPTION :

PROJECT TITLE : CONVERSION OF REFRIGERATING
COMPRESSORS TO HFC 134a BY MISR
COMPRESSORS MANUFACTURING CO.
(MCMC)

PROJECT DURATION : THREE YEARS.

SECTORS COVERED : HOUSE HOLD REFRIGERATORS &
SIMILAR APPLIANCES

PROJECTED ODS PHASE-OUT FROM
PROJECT : 350 TONS/YEAR

PROPOSED BUDGET : U.S. \$2,490,413

IMPLEMENTING AGENCY : MISR COMPRESSOR MANUFACTURING
CO.

NATIONAL COORDINATING AGENCY : EEAA

PROJECT SUMMARY

According to the spirit of the MONTREAL protocol, and Egypt's COUNTRY PROGRAM for phase out of ODS's (MCMC) guided by EEAA has prepared this project to replace the CFC-12 used in house-hold refrigerators, and similar appliances by HFC-134a. The project will be able to phase out more than 350 tonnes/ODS's/year. To achieve this target MCMC has to develop new designs and modify its factory to produce a family of compressors which use HFC-134a. The total cost of the project is about U.S.\$ 2.5 million, and shall be executed over three years, namely 1992, 1993 and 1994.

MISR COMPRESSOR MANUFACTURING CO.
[MCMC]
Cairo, Feb. 6th, 1992

REVISED PROJECT FOR
MODIFICATION OF MCMC COMPRESSORS
FOR UTILIZING THE HFC-134a

A - INTRODUCTION

This report includes the necessary facility and technical support for manufacture of a newly designed HFC-134a refrigerator compressors in MCMC project which had been designed for CFC-12 compressors. This proposal was prepared by MCMC with the help and guidance of the Egyptian Environment Affairs Agency (EEAA).

B - PRESENT CONSUMPTION OF CFC-12 IN EGYPT

The total number of house hold refrigerators, freezers, water coolers, display cabinets and similar appliances in use in Egypt is about 7000000 seven million units while the normal production is about 1000000 one million per annum. The CFC-12 present in these appliances might be equal to about 1100 metric tons (about 0.18 kg/unit).

The present yearly demand of HFC-12 for the above mentioned purpose is as follows:

For new appliances	=	1000000×0.00018	=	180 ton/annum
For repairs	=	$7000000 \times 0.00018 \times 0.10$	=	126 ton/annum
Contingency 10% of total			=	<u>43 " "</u>
Total			=	349

C - OBJECTIVE

The implementation of this project will provide a local source of refrigerator compressors needed to accomplish an optimum phaseout of ODSs in Egypt in accordance with EGYPT's COUNTRY PROGRAM and the spirit of the MONTREAL PROTOCOL. The size of production of these compressors shall satisfy the Egyptian market needs, and part of the requirement of the Arab market.

D - OUTCOME OF THE PROJECT

MCMC's yearly production of about 1.8 million HFC-134a compressors will phase out about 349 tons of CFC-12 yearly in Egypt. It will also participate in helping the same purpose in other countries defined under the Montreal Protocol by exporting to them an additional number of HFC-134a compressors. This will increase the total phased out amount of CFC-12 by MCMC compressors. MCMC's probable export market within the countries defined under the Montreal Protocol are as follows: -

Italy(1)	126000	
Syria	125000	
East Jordan	60000	
Morocco	100000	
Tunisia	60000	
Nigeria	100000	
Russia	<u>100000</u>	
Total	671000	compressors per annum

- (1) According to the Licence Agreement the Licensor should buy a minimum of 7% of MCMC annual production for his own use.

E - INFORMATION ON MCMC

E.1 MCMC is an Egyptian share holding company incorporated in February 1988 under Egyptian laws 43 of 1974 and 230 of 1989. The articles of incorporation and the statutes of the company were approved by the presidential decree no. 17 of 1988 and published in the official gazette no.43 dated Feb. 20th, 1988. MCMC has been commercially registered under no.(59948) on March 30th, 1988, its tax card is no.2207 dated April 26th, 1988. MCMC has full powers to own the properties and to own and to carry on the business which it owns and carries on and proposes to own and to carry on the purpose of the project. The first share holders meeting was held on 25.2.1988. The construction of the factory buildings and the utilities is about to be finished on its owned land of 89900 square meters, in the industrial area A-2 in the Tenth of Ramadan town. The land contract has been registered under no. 978 SHARKIA on 27.3.1991.

E.2 MCMC will establish in Egypt the first refrigerator compressor manufacturing plant in the middle east region with a capacity of 1.8 million units per annum for house hold refrigerators, freezers, watercoolers, display cabinets and similar appliances. All such compressors are currently imported from Japan and Europe. The production of MCMC factory shall almost satisfy all the needs of the Egyptian market and a good part of the Neighboring Arab countries.

E.3 OWNERSHIP

	<u>L.E.(000)</u>	<u>% of total</u>
The Egyptian Aborad for Investment & Dev. Co.	2,500	2.9
Delta Industrial co. "Ideal"	5,000	5.9
Suez Canal Bank	7,055	8.3
Misr Iran Bank for Development	2,500	2.9
Misr Insurance Co.	2,500	2.9
Egyptian Gulf Bank	7,000	8.2
Dr. Salah El Din Ibrahim El-Deeb & Others	8,145	8.2
Dallah International Holding Co. *	50,800	59.8
Shekh Khaled Al Khalifa *	2,500	2.9
Philips N.V. *	<u>5,000</u>	<u>5.9</u>
	<u>85,000</u>	<u>100.0</u>

* Paid in US Dollars

Dallah International Holding company is an Egyptian subsidiary of the Dallah Al Baraka Group, a leading Saudi Arabian financial group. Delta Industrial Company is the largest refrigerator manufacturer in Egypt and the maker of "Ideal" brand of refrigerators.

It had been already agreed to increase the equity capital to be L.E. 106 million to allow for the participation of the following shareholders :

L.E.(000)

The International Finance Corporation (IFC) 9,900 in U.S. \$

The Saudi Egyptian Co. for Industrial

Investment (SECII) 11,100

MCMC shall obtain from the International Finance Corporation (IFC) a loan of U.S \$ 13.84 million to finance completion of the project and to acquire the necessary technology license, with technical support to modify MCMC's compressors to work with HFC-134a instead of CFC-12.

F - TECHNOLOGY OF THE PROJECT

1 - MCMC has a technical assistance and licensing agreement with WHIRLPOOL ITALIA of Italy which itself is a subsidiary of WHIRLPOOL CORPORATION, U.S.A., one of the largest compressor manufacturers in the world. MCMC's factory is designed to manufacture about 1.8 million refrigerator compressors in seven different sizes working with CFC-12. Replacing the CFC-12 by the none ozone depleting HFC-134a must be combined with using ESTER or POLYESTER oil to secure compatibility.

2 - The development of the seven compressors to use HFC-134a and the polyester oil will include:

- (1) Modifying the design of the compressors to overcome the drop of performance due to the nature of the new gas, the modifications will include:
 - a- bigger stroke by:
 - New eccentricity of crank shaft.
 - New piston (new position of piston pin)
 - b- Reduction of the dead volume by:
 - Thinner valve plate
 - Smaller discharge port
 - New suction valve
 - c- Readjustment of the present electrical motors probably by change of the wire diameters or the number windings turns or by both.
 - (2) Ensure material compatibility which will require the use of new kind of insulation, a problem to be solved by the local Egyptian wire manufacturer at the cost of MCMC. (The manufacturing of the standard double coated enamelled copper wire had been developed for the first time in Egypt for MCMC).
- 3- a - Manufacturing the modified compressor will require new tools, jigs, fixtures, mechanical gauges, master gauges for electronic & pneumatic measuring equipment, new and additional laboratory equipment, new pattern sets, new dies, etc.
- b - As using paraffins and waxes shall be prohibited to avoid obstructions in the appliances, specially in the capillary, this will require new washing machines for the incoming parts, such as screws, springs, piston pins, oil pick up, muffler covers, and other parts which will be obtained from suppliers to clean them from these substances.

- c - Where the manufactured parts can not be washed such as electric windings the machines should be developed to use hydraulic oil compatible with both the HFC-134a and the POLYESTER oil.
- d - It will be necessary to add a new storage supply, pumping and metering system for the POLYESTER oil separate from the system of the standard present oil. The attached drawing is the new modification of the oil system which contains two separate plants to allow using two different oils.
- e - Producing two different compressors will required doubling some of the testing equipment to avoid bottle necks in the flow of testing and production.

G - CUSTOMER'S SERVICE

To complete the conversion of refrigerators and similar appliances to HFC 134a, it will be necessary to modify these appliances and readjust it to perform satisfactorily with the said gas and the new oil. MCMC should carry out in its laboratories the necessary experimental investigations on these appliances using its newly developed compressors to provide their manufacturers with the required technical advice to reach this primary target. Applying this solution will enable the manufactures of refrigerators and similar appliances to convert them to HFC-134a and give them the time required for optimizing the designs of the concerned appliances to their satisfaction technically and economically. MCMC also may take part of this final target of optimization.

H - PROJECT REQUIREMENTS FOR CONVERTING TO HFC-134a

- The conversion to HFC-134a will be started by intensive research and development efforts, followed by engineering, testing and manufacturing. Table (1) contains a list of equipment, personnel, and technology transfer requirements necessary for MCMC to meet the incremental requirements necessary for MCMC to accomplish the timely and cost effective change of MCMC refrigeration compressors to support use of HFC-134a.
- Technology is to be obtained from WHIRLPOOL ITALIA, a subsidiary of WHIRLPOOL CORPORATION [U.S.A.], one of the major leading manufactures of compressors in the world, who will provide on-site expert supervision of all conversion works directly required for or encountered with changing to HFC-134a.

ESTIMATE-MODIFICATION TO MCMC COMPRESSOR PROJECT FOR
MANUFACTURE OF REFRIGERANT HFC-134a COMPRESSOR

[1] - EQUIPMENT LIST

<u>ITEM</u>	<u>U.S.\$</u>
Controlled ambient test cells.	200,000
2 cells, 4 stations each	
Compressor calorimeter	140,000
Compressor life test stands	48,000
Motor Dynamometers	45,000
Lubricating oil test equipment	10,000
Electrical wire insulation continuity checker	33,000
Electrical wire enamel scrap tester	52,000
Electrical wire enamel heat cut through tester	10,000
Electrical motor lamination tester	30,000
Noise test apparatus	150,000
One washing machine for incoming steel parts	700,000
One washing machine for rubber parts	120,000
Oil plant for POLYESTER oil	140,000
<u>RETOOLING (1)</u>	
For crank shaft : 5-pattern sets	80,000
: collets	48,000
For - pistons : fixtures	10,000
For valve plate : 2-pattern sets	16,000
: Jigs	15,000
: Tools	2,000
For valves : Dies	80,000
<u>Gauges-Gauge masters (1)</u>	
New gauges for valve plates	5,000
" " " pistons	5,000
" " " crankshafts	<u>24,000</u>
 TOTAL	 1,963,000

(1) The costs of retooling, gauges and gauge masters are based on the offers of the basic relative equipment and the estimates made by the Licensor.

[2] - PERSONNEL REQUIREMENTS

(U.S.\$ = L.E. 3.31)

<u>TITLE</u>	<u>COST/YEAR</u>	<u># YEARS</u>	<u>NO/TYPE</u>	<u>TOTAL</u>
Project leader (Italian)	\$ 45,000	1.5	1	67,500
Project engineers (Egyptians) (= \$ 6000)	L.E. 20,000	1.5	1 compressor 1 electrical 1 refrigerator 1 production 1 laboratory	45,000
Technicians	L.E. 12,000 (=\$ 3625)	1.5	3	16,312
Total for personnel				<u>128,812</u>

N.B.

Eighteen months have been estimated for the development of the new compressors considering the following points :

- 1 - MCMC is planned to produce a family of 7 compressors of different capacities.
- 2 - It is assumed that some problems of conversion to HFC-134a, and using a new oil are not completely solved.
- 3 - The new compressors will require continuous work to reach an acceptable technical level, the duration of one of the life tests is 4000 hrs.

[3] - TECHNOLOGY TRANSFER EXPENSES

a - Expenses for out of country travel for conferences, seminars, consulting, education, - project engineers.

<u>Personnel</u>	<u>no. of trips per year</u>	<u>Total trips per year</u>
Project leader	3	3
Project engineers (5)	1 each	5
	Total	8

Budget per trip:	
Transportation	= \$ 1,000
Living (\$300/day x 10 days)	= \$ 3,000
Other expenses (conf. fees, etc.)	= \$ 1,000
Total	= \$ 5,000

For one year 8 x \$ 5000	= \$40,000	
Cost over 1.5 year project	= 1.5 x \$40,000	= <u>60000</u>

b - Expenses for within country travel to suppliers, production facilities, universities, government agencies by project personnel:

<u>Personnel</u>	<u>no. of trip/year</u>	<u>Total</u>
Project leader	6	6
Project Engineers (5)	2 each	10
	Total	<u>16</u>

Cost per trip = \$ 300	
Cost for one year = 16 x \$ 300 = \$ 4800	
Cost over 1.5 year project = 1.5 x \$ 4800 =	<u>\$ 7200</u>

c - Know-How :

7 compressors x \$ 15000 = \$105,000

Total cost of technology transfer \$172,200

TOTAL PROJECT COST

-	EQUIPMENT	1,963,000
-	PERSONNEL	128,812
-	TECHNOLOGY	172,200
-	CONTINGENCY 10%	<u>226,401</u>
		<u>2,490,413</u>

I - PROJECT EXECUTION SCHEDULE

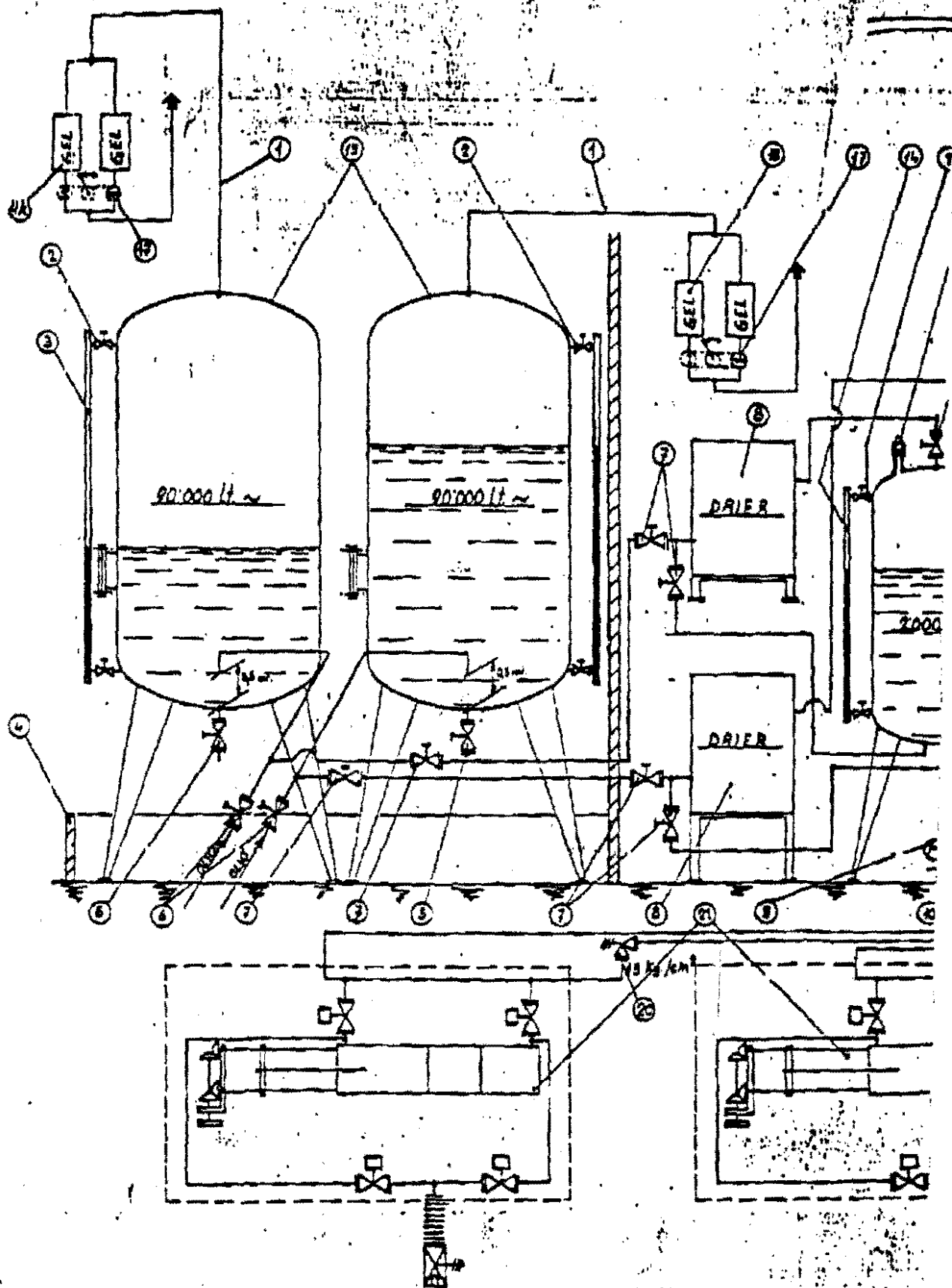
1. According to plan MCMC factory shall be in production during the third quarter of 1993, hence it is necessary to start immediately modifying the works and placing the orders of additional supplies required for the conversion to HFC-134a.
2. Starting production during the transition period from CFC-12 to HFC-134a MCMC have decided to convert its production as follows:
 - [1] To be ready to produce both HFC-134a and HFC-12 compressors from the first day of normal production.
 - [2] The size of production of HFC-134a compressors shall be decided according to a plan to be agreed upon with the customers under the umbrella of EEAA, and will be gradually increased within the said plan until the full production capacity shall be reached and no more CFC-12 compressor shall be produced.
 - [3] MCMC shall be able to phase out the use of HFC-12 in newly produced house-hold refrigerators and similar appliances in Egypt within two years from the date of starting production, that is early during 1996.

I - FINANCE PROGRAMME

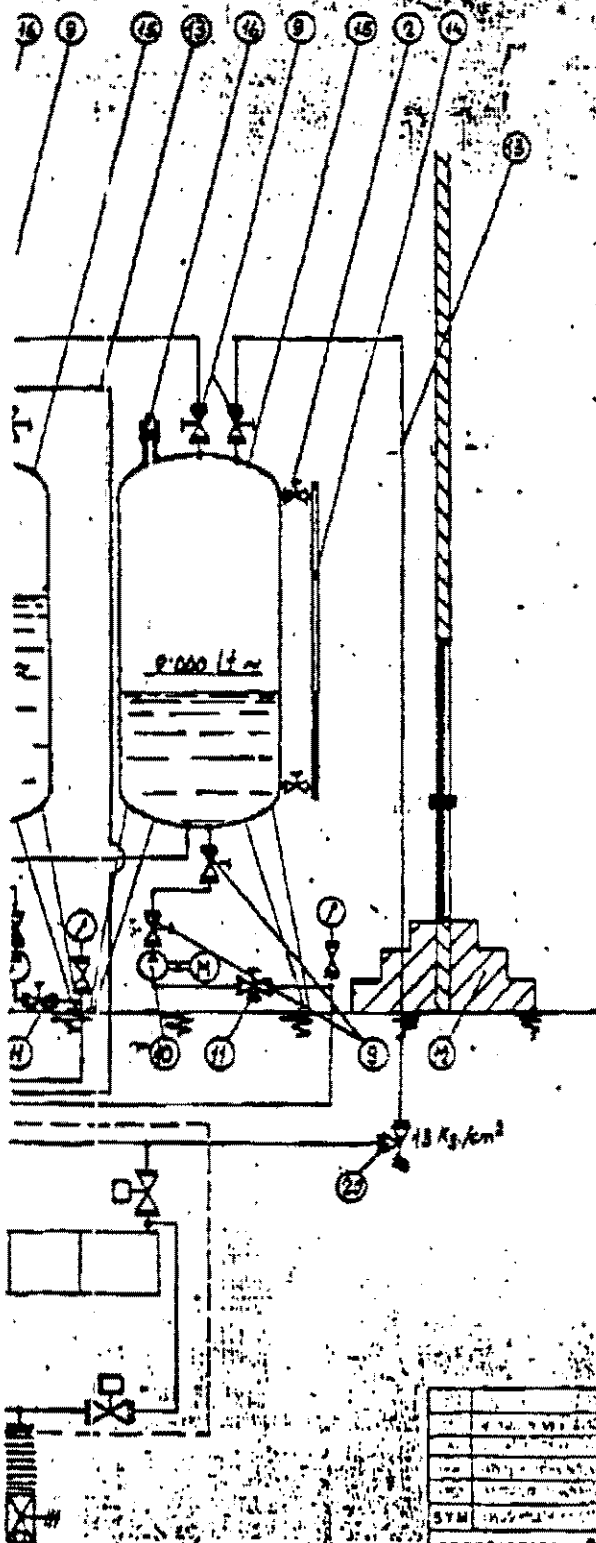
<u>Year</u>	<u>U.S. Dollars</u>
1992	2,142,792
1993	347,621
	2,490,413

[ONLY TWO MILLION FOUR HUNDRED NINETY THOUSAND FOUR HUNDRED THIRTEEN U.S. DOLLARS].

wp\r134\m



3/4



- 1 PIPE 4 1/4"
- 2 TAPS 3/4" USUALLY CLOSED
- 3 LEVELS (TRANSPARENT PLASTIC)
- 4 WALL TANK TO CREATE A CONTAINING
- 5 VOLUME m³ 30
- 6 TAPS 1 1/2"
- 7 TAPS 1 1/2"
- 8 OIL DRYING PLANT
- 9 TAPS 1"
- 10 PUMP RANGE 600 ltr AT 45 ALM
- 11 3 WAY TAPS 3/4" FOR DRAWING OIL
- 12 WALL TANK TO CREATE A CONTAINING
- 13 VOLUME m³ 4
- 14 PIPE 3/4"
- 15 LEVELS (TRANSPARENT PLASTIC)
- 16 STAINLESS STEEL TANK AT INTERNAL LOW
- 17 PRESSURE PROOF
- 18 BREATHER VALVE (CALIBRATED AT 0.5 bar)
- 19 TAPS 1 1/2"
- 20 BREATHER DEVICE CONNECTED WITH DRYING
- 21 SALTS THE TAPS MUST BE MECHANICAL CONNECTED
- 22 EACH OTHERS IN SUCH A WAY THAT WHEN IS OPEN
- 23 THE OTHER IS CLOSED AND VICE VERSA
- 24 IRON TANK TREATED OR STAINLESS STEEL
- 25 BACK PRESSURE VALVE
- 26 OIL CHARGING APPARATUS

SYMBOL		CHANGES		DATE BY		NUMBER	
DESCRIPTION		SCHEME FOR TREATMENT AND		DATE		PROJECT	
DISTRIBUTION OF MILLER		COMPRESSION TURBILANT OIL		28/01/92		3042	
SIGNATURE		DIRECTION		DATE		PROJECT	

PROJECT EVALUATION SHEET

COUNTRY OR REGION: EGYPT

PROJECT TITLE: Recovery and Phasing-Out of ODSs in Foam Production in Taki Vita Co.

BUDGET: US \$ 1.7 Million

INCREMENTAL COSTS: Not Determinable (ND)

*COST EFFECTIVENESS: \$ ND per Kg. ODP Saved Annually

PROJECT TIMEFRAME: one year from availability of funding

TECHNICAL REVIEW COMPLETED: YES NO X

SECRETARIAT'S COMMENTS

The project document contains insufficient information for The Secretariat to complete a review and evaluation. Specifically, there is no information on how the project will be executed, the timetable for implementing the various activities of the project, and the relationship of the project to the action plan of the Government of Egypt. Moreover, there isn't a sufficiently detailed project description indicating the various inputs required for the project.

SECRETARIAT'S RECOMMENDATIONS

The Secretariat recommends that this project be revised and resubmitted at a later date.

* Determined as the ratio of incremental costs to the estimated annual saving of ODP (\$/ODP_{Kg}).

Sample Project Cover Sheet.

Country : Egypt.
Calculated ODS : 1830 Tonnes of CFCs in 1991.
Consumption
Project Title : Recovery and Phasing-Out of ODSs in
Foam Production in Taki Vita Co.
Project Duration : 1 year from the availability of the fund.
Sectors Covered : Foam Production.
Projected ODS : About 75 tonnes of R 11 in addition to
Phase-Out re-use the scrap after the treatment.
Proposed Budget : About \$ 1.7 million.
Executing Agency : Taki Vita Co., Dow Co. and GOFI.
Implementing Agency : UNDP/USEPA(Feasibility Studies).
National Coordinating : Egyptian Working Group, EEAA.
Agency

Project Summary

Taki Vita Co. is a joint venture company producing flexible and rigid foam. And according to Montreal Protocol, the company decided to phase out ODS in the moulded flexible foam and reducing the consumption of R11 in the rigid insulating foam by 50%. In addition to the removal of CFCs from the insulating foam of about 60,000 refrigerators in use every year and reuse the material coming out after treating as an ordinary scrap. The project estimation cost is about \$ 1.7 million.

7- Detailed Indicative : As shown in Annex I.
Budget.

8- Implementing Agency : UNDP/ USEPA (Feasibility Studies).

The Estimated Cost of the Project:

1) Phasing out of about 25 tonnes of R11:

A- Incremental cost of material (\$715.000-\$650.000)	= \$ 65.000
B- New Pumps	= \$ 3.000
C- New Mixing Heads	= \$ 5.000

Total	\$ 73.000
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2) Reduction of 8.75 Tonnes of R11 :

A- Incremental cost of materials (\$ 373.750 - \$ 325.000)	= \$ 48.750
B- Pumps	= \$ 1.000
C- Mixing Heads	= \$ 1.500

Total	\$ 51.250
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3) Removal of CFCs from insulating foam of 60.000 units ; about 50 tonnes.

- Estimated Cost of the machines (4x\$ 400.000) = 1.600.000

Total Cost of the Project is about \$ 1.7 million.

The Estimated Cost of the Project:

1) Phasing out of about 25 tonnes of R11:

A- Incremental cost of material (\$715.000-\$650.000)	= \$ 65.000
B- New Pumps	= \$ 3.000
C- New Mixing Heads	= \$ 5.000

Total	\$ 73.000
-------	-----------------

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A- Incremental cost of materials (\$ 373.750 - \$ 325.000)	= \$ 48.750
B- Pumps	= \$ 1.000
C- Mixing Heads	= \$ 1.500

Total	\$ 51.250
-------	-----------------

3) Removal of CFCs from insulating foam of 60.000 units ; about 50 tonnes.

- Estimated Cost of the machines (4x\$ 400.000)	= 1.600.000
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Total Cost of the Project is about \$ 1.7 million.

PROJECT EVALUATION SHEET

COUNTRY OR REGION: EGYPT

PROJECT TITLE: Technology Transfer and Using Non-ODS in Foam Production

BUDGET: US \$ 2.6 Million

INCREMENTAL COSTS: Not Determinable (ND)

*COST EFFECTIVENESS: \$ ND per Kg. ODP Saved Annually

PROJECT TIMEFRAME: START 1992 END 1993

TECHNICAL REVIEW COMPLETED: YES NO X

SECRETARIAT'S COMMENTS

Apart from some brief background information on the short- and long-term objectives of the project, there is no description of the project in the project document. Consequently, The Secretariat is unable to determine the specific nature of the technology transfer required and to estimate the associated costs.

Also, the project document does not provide information on the institutional framework for the implementation and monitoring of the project.

SECRETARIAT'S RECOMMENDATIONS

The Secretariat recommends that this project be revised and resubmitted at a later date.

* Determined as the ratio of incremental costs to the estimated annual saving of ODP (\$/ODP_{kg}).

1- Name of the Project : Technology Transfer and Using Non-ODS in Foam Production.

- 2- Background :
- Since Egypt's ratification of the Montreal Protocol in August 88 and its being qualified under para. 1, article 5 of the Protocol.
 - Rigid polystyrene is used in many major application such as heat insulation for buildings and cooling units, packaging of fragile items, food and agriculture products.
 - Al-Sharif Plastic Factories are producing rigid polysterene foams using R12 as a blowing agent. The production is about 400 tonnes and it is expected to increase annually by 20 % per year.
 - The current consumption of R12 about 50 tonnes/year and it is expected to increase annually by 20% /year.
 - The a/m factories have 250 cooling systems & air-conditioning from different capacities. These equipment consume about 25 tons of CFCs which must be phased-out within 1-2 years.

3- The Objectives of the Project : A- Short-term objectives:

- 1) Phasing-out 50 tons of R12 in processing rigid polystyrene foam.
- 2) Phasing-out 25 tons of R11 and R 12 used in cooling systems for machines and air-conditioning of factories.
- 3) Using R 134a as an alternative to R11 and R12.

Sample Project Cover Sheet

Country : Egypt.
Calculated ODS : 1830 Tonnes of CFCs in 1991.
Consumption
Project Title : Technology Transfer and Using Non-ODS
in Foam Production.
Project Duration : 1 year.
Sectors Covered : Foam and Plastic.
Projected ODS : 75 Tonnes.
Phase-Out
Proposed Budget : \$ 2.6 million.
Executing Agency : Al-Sherif Plastic Factories , ICI in
U.K., and GOFI.
Implementing Agency : UNDP/UK Environment Department
(Feasibility Studies).
National Co-ordinating : Egyptian Working Group, EEAA.
Agency

Project Summary

Al-Sharif Plastic Factories are producing rigid polystyrene foam by using R12 as a blowing agent. The current consumption of R12 is about 50 Tons per year. These factories have about 250 cooling systems and air-conditioning for the factories consume about 2.5 tonnes of CFCs. The project aims to phase-out 75 tonnes of CFCs and using the alternative R 134a with a total cost about \$ 2.6 million.

B- Long-term objectives:

- 1) Technology transfer and using appropriate and feasible substances in the production.
- 2) Taking all safety measures in the production areas against fire risks, flamability, explosion and toxicity.

4- The Expected Results: Phasing-out 75 tonnes of CFCs used in processing rigid polystyrene foam, cooling systems for machines air-conditioning for factories and using R 134a.

5- The National Agency : The working group in EEAA will supervise the implementation of the project while UNEP will disburse the fund.

6- The Implementation : The project will be implemented during 1 year according to the -
Schedule enclosed Annex I.

7- The Detailed Indicative : The cost estimation of the project
Budget is about \$ 2.6 million according to the attached Annex II.

Implementation Schedule

Subject	Year Month	1992												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	
1- Preparatory Stage		←	→											Includes studying the project with one of the international companies, experts arrival, requirements of the needed identification and the preliminary feasibility study.
2-Second Stage				←	→									- Importing raw materials, equipment , spare parts for using the new substitutes. - Carrying out modifications in machinery.
3-Experimental Stage						←	→							- Carrying experimental tests. - The needed revision of the project. - Quality Control Tests. - The required inspection and repair. - Training the personnel.
4-Production Stage											←	→		- Final Quality Control Tests. - Marketing and Distribution. - Training the Authorized Personnel.

N.B. — 1- The first month will begin as soon as the approval of the project and transferring the fund.

2- Experts duration will be 2 weeks in the preparatory stage and

4 weeks in the experimental stage.

Total 6 weeks.

Detailed Indicative Budget

A- Rigid P.S. Foam:

1- Using R134a as a Substitute for R11 & R12:

- Quantity required 50 Tonnes.
- Incremental Cost \$ 30,000 for each tonne.
- Total incremental cost for using R134a = $50 \times 30,000 = \$ 1,500,000$.

2- Experts:

- Number of experts 2 experts.
- Duration of each 6 weeks.
- Daily cost of each expert \$ 500 (including air-tickets and accomodation...etc).

Total Expenses $2 \times 45 \text{ days} \times \$ 500 = \$ 45,000$

3- Training the Personnel:

- Number of Trainees 20 Trainees.
- Duration of Training 15 Days.
- Daily Expenses of Each \$ 30

Total Expenses $20 \times 15 \text{ Days} \times \$ 30 = \$ 9,000$

4- Consumption of Experimental Raw Materials:

- 1 Tonne R 134a
- 8 Tonne P.S. & Other requirements = \$ 60,000

Total requirements (1) \$ 1,614,000

B- Cooling Systems & Air-Conditioning for the Factories:1- Non-ODS:

- Quantity Required	25 Tonnes
- Increase in Cost/Tonne	\$ 30.000

Total Incremental Cost 25 x \$ 30.000 = \$ 750.000

2- Experts:

- Number of Experts	1
- Duration	2 weeks (15 days).
- Daily Expenses	\$ 500

Total 1 x 15 days x \$ 1000 = \$ 7.500

3- New parts & Spare Parts:

250 units x \$ 1000 = \$ 250.000

Total Requirements (2) \$ 1.007.500

The Total Cost (1) + (2) = \$ 2.621.500 (About \$ 2.6 million.).

PROJECT EVALUATION SHEET

COUNTRY OR REGION: EGYPT

PROJECT TITLE: Recycle and Waste Disposal

BUDGET: US \$ 1 Million

INCREMENTAL COSTS: Not Determinable (ND)

*COST EFFECTIVENESS: \$ ND per Kg. ODP Saved Annually

PROJECT TIMEFRAME: One year from availability of funds

TECHNICAL REVIEW COMPLETED: YES NO X

SECRETARIAT'S COMMENTS

The project document lacks sufficient technical information for The Secretariat to complete a review or evaluation. Also, the Secretariat is not clear on the estimated budget for the project and how it was derived. There are two budget figures quoted for the project - US \$1 million and US \$2.5 million, respectively.

The project document also lists the General Organization for Industrialization (GOFI) and Bayer as executing agencies. However, no information is provided on these agencies and their relationship, if any, to the Egyptian government.

SECRETARIAT'S RECOMMENDATIONS

The Secretariat recommends that this project be revised and resubmitted at a later date.

* Determined as the ratio of incremental costs to the estimated annual saving of ODP (\$/ODP kg.).

Sample Project Cover Sheet

Country : Egypt.
Calculated ODS : 1830 Tonnes of CFCs in 1991.
Consumption
Project Title : Recycle and Waste Disposal.
Project Duration : 1 year from the availability of the fund.
Sectors Covered : Refrigeration.
Projected ODS : About 140 Tonnes of CFCs in addition to
Phase-out from sort all the parts of the refrigerators
the Project into parts and re-use it.
Proposed Budget : S\$ 1 million.
Implementing Agency : UNDP and Federal Ministry of Environ-
ment in Germany (Feasibility Studies)
Executing Agency : GOFI and Bayer.
National Co-ordinating: Egyptian Working Group, EEAA.
Agency

Project Summary

The project aims to recycle about 250 tonnes of R12; about 1.4 million refrigerators which is about 25% of 7 million units in use in the Egyptian market, in addition to disassembling and sorting all the parts of these refrigerators for a re-use. The cost estimation of the project will be about US \$ 2.5 million in an area of about 1600 m². The executing agency will be the General Organization of Industrialization (GOFI).

1-Name of the Project : Recycle and Waste Disposal.

- 2- Brief Background : - During the 8th decade of this century, and before Egypt joined the Montreal Protocol, the consumption of CFCs was about 8000 tonnes/year.
- Egypt could reduce its consumption down to about 2375 tonnes in 1989.
 - In 1990 EEAA undertook with USEPA a national case study on :

" The Costs to Egypt of Protecting the Stratospheric Ozone Layer".

This study mentioned that the cost for Egypt to phase out CFCs consumption to cope with Montreal Protocol would be about US \$ 30-37 million.

- in 1991 the World Bank carried out a country programme for Egypt and mentioned in the draft that in 1990 the consumption of CFCs in Egypt was about 1830 Tonnes. This decrease was primarily due to the decreased production of home refrigeration and to a Ministerial decree that prohibits the use of CFCs in the aerosol industry.

- 3- The Objectives of the Project : -In Egypt there are about 7 million refrigerators in use, each contains about 180 grams of R12. Assuming that about 20% of these refrigerators may need maintenance and R12 recycle every year which is about 252 tonnes per year.

- The project contains the system of treating the waste disposal of all the parts of the refrigerators by disassembling and sorting out the components into different metals from iron, copper, plastic & the insulation foam.
- The projects aims to recycle R12 as a refrigerant and recycle all the parts of the refrigerators for a re-use.
- The project will achieve Egypt's policy concerning phasing out CFCs to cope with the Montreal Protocol.

4- The Expected Results: It is expected that through this-project, about 250 tons of R 12 will be recycled in addition to sort all the parts of the refrigerators to be re-used.

5- Executing Agency : The General Organization for Industrialization (GOFI) will be the national agency responsible for the disbursement of the fund, monitoring the project and also receiving the final project.

6- The Implementation : As soon as the fund is available, the suppliers provide and install the equipment of the project which will serve and recycle R12 and all the parts of the refrigerators.

7- Estimated Budget : It is estimated that the cost of the project is about 2.5 million US\$ in an area of about 1600 m². As soon as the approval of the project, the detailed budget and expenditures will be prepared and submitted.

8- Implementing Agency: UNDP/Federal Ministry of Environment in Germany (Feasibility Studies)