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

Twelfth Meeting
Montreal, 28-30 March 1994

COUNTRY PROGRAMME: COLOMBIA

This document consists of:

- (a) Country Programme Evaluation Sheet (prepared by the Fund Secretariat)
- (b) Transmittal Letter from the Government of Colombia
- (c) Country Programme Cover Sheet
- (d) Country Programme Executive Summary¹
- (e) Institutional strengthening project proposal

¹

Complete Country Programme was sent only to members of the Executive Committee that requested full documentation.

COLOMBIA COUNTRY PROGRAMME EVALUATION SHEET

National Implementing Agency: National Council for the Preservation of the Ozone Layer

Status of ratification of the Vienna Convention and the Montreal Protocol

	Signature	Ratification	Entry Force
Vienna Convention (1985)		16/Jul/90	14/Oct/90
Montreal Protocol (1987)		06/Dec/93	06/Mar/94
London Amendment (1990)		06/Dec/93	06/Mar/94
Copenhagen Amendment (1992)			

Production of controlled substances: 0 metric tonnes (mt)

Consumption of controlled substances (1992): 1,985.0 metric tonnes
1,973.6 weighted tonnes (ODP)

Substance (ton)	CFC						Halon			Solvents			M-Br
	11	12	113	114	115	Total	1211	1301	Total	CTC	MCF	Total	
ODS	330.0	1,374.0			22.0	1,726.0	20.0	15.0	35.0	24.0	200.0	224.0	371.0
ODP	330.0	1,374.0			13.2	1,717.2	60.0	150.0	210.0	26.4	20.0	46.4	259.7

Source: Country Programme (1994)

Distribution of ODP by substance:

CFC: 87.0% Halon: 10.6% CTC, MCF: 2.4%

Distribution of ODP by sector:

Sector:	Aerosol	Foam	Halon	Other	Refrig.	Solvent
Consumption (tonnes):		315.0	210.0		1,402.2	46.4
Percent of total:		16.0%	10.6%		71.0%	2.4%

Country Programme

Duration of country programme: 3 years (1994-1996)

ODS phase-out target:

Ban on importation and use of ODS in Annexes A and B of the Montreal Protocol by 1 January 1994

Phase-out priority area:

Foam and refrigeration sectors

Cost of activities in country programme: \$54,869,000

Strategy:

The Govt. is committed to ban importation and use of controlled substances in Annexes A and B of the Montreal Protocol by 1 January 1994. Maintenance of refrigeration equipment will be done with recycled CFC. The Govt. will establish a mechanism to control ODS imports (fees, duties, licenses), will develop a technical co-operation system to acquire and transfer non-ODS technologies, and identify ODS recovery activities. Several investment projects in the refrigeration and foam sectors have been identified.

NOTE: The Govt. prepared the CPG without assistance from the Multilateral Fund.

COMMENTS AND RECOMMENDATIONS OF THE FUND SECRETARIAT

COMMENTS

1. The Government of Colombia ratified the London Amendment to the Montreal Protocol only in December 1993. By February 1994, the Government had completed its country programme, without receiving financial support from the Multilateral Fund, and submitted to the Fund Secretariat, through UNDP, for consideration by the Executive Committee at its twelfth meeting.

2. The Government of Colombia is committed to ban the importation and use of controlled substances in Annexes A and B of the Montreal Protocol by 1 January 1994, in the same time frame as that of developed countries. Any controlled substances required for the maintenance of refrigeration equipment will be from recycled substances.

3. The Government is submitting, within the country programme, an institutional strengthening request for establishing the National Council for the Preservation of the Ozone Layer, responsible for the implementation of the action plan proposed in the country programme.

RECOMMENDATIONS

The Fund Secretariat recommends as follows:

1. To approve the Colombia Country Programme. Approval of Country Programme does not denote approval of the projects identified therein or their funding levels;

2. To approve the amount of US \$317,790 and US \$41,313 support costs for the institutional strengthening programme to be included in the UNDP 1994 Work Programme.



REPÚBLICA DE COLOMBIA

MINISTERIO DEL MEDIO AMBIENTE

Santafé de Bogotá D.C.,

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SEÑOR DIRECTOR DE LA SECRETARÍA
DEL FONDO MULTILATERAL PARA LA
APLICACIÓN DEL PROTOCOLO DE MONTREAL
DR. OMAR EL-ARINI

Apreciado Dr. EL-ARINI:

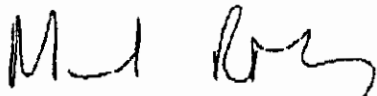
Como es de su conocimiento, Colombia será parte del Protocolo de Montreal desde su aprobación por Ley 30 de 1990, instrumento de aplicación nacional que entró en vigencia el 14 de octubre del mismo año. El 28 de diciembre de 1992 se sancionó la Ley 29 mediante la cual Colombia aprueba el Protocolo de Montreal, junto con las adiciones y enmiendas de Londres y de Copenhague, acordadas en 1990 y en 1991. El país se encuentra en la situación prevista en el párrafo 1 del artículo 5 del mismo.

Este Ministerio, como autoridad Nacional competente en los asuntos ambientales, tiene el agrado de presentarle un plan de acción para obtener la asistencia técnica y financiera del Fondo Multilateral, a través del Programa País.

Ello implica el compromiso de Colombia de ejecutar dicho programa, así como de aplicar las medidas que sean necesarias con el fin de implementar el Protocolo de Montreal. En tal sentido será creada la Comisión Nacional para la Preservación de la Capa de Ozono, por Decreto Presidencial.

En consecuencia, solicito al Señor Director, se sirva someter el plan de acción propuesto por Colombia a la consideración del Comité Ejecutivo del Fondo Multilateral.

Atentamente,


MANUEL RODRIGUEZ DECORBA
Ministro del Medio Ambiente



MONTREAL PROTOCOL

COLOMBIAN COUNTRY PROGRAMME

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COUNTRY PROGRAM COVER SHEET

Country: COLOMBIA

Lead National Agency: National Council for the Preservation of the Ozone Layer

Implementing Agency: UNDP

Date Received:

Period Covered By
Country Program: 1994-2000

1. Phase-Out Schedule

Substances	Current Consumption (Tons.ODP) Year: 1992	Planned Total Consumption Till		Planned Year of Phase-out	
		Article 5 Schedule	Accelerated Schedule	Article 5 Schedule	Accelerated Schedule
CFC-11	330	6900	1284	2006	1996
CFC-12	1374	31220	5683	2006	1996
Halon 1211	60	432	60	2006	1994
Halon 1301	150	5530	230	2006	1994
Carbon Tetrachloride *	39.6				
Methyl Chloroform	20	40	33	2006	1996
TOTAL:	1,973.6	44,122	7,290		

* No projects are included in the initial Phase of the Country Program

COUNTRY PROGRAM COVER SHEET (Continued)

2. GOVERNMENT ACTION PROGRAM.

Year	Description of Action	Sector	Intended Effect
1992	Implement the phase out chronogram of ODS, for every application mentioned in the program, in correspondence with the provisions herein assigned in the Protocol.	All	
1992	Establishment of the requirements related with ODS consumption data and amounts of substitute substances.	All	
1994	Establish maximum ODS levels for essential applications in which there is no temporary or definite replacement establishing in detail the measures and the persons in charge of them. This will include the explicit prohibition of importation of the mentioned substances in the MP Annexes A and B and the authorization for their recycling under determined situations.	All	
1994	Implement the verification mechanisms for nationally produced and imported goods that contain or require ODS use in their manufacturing process.	All	
1993 and 1994	Identification of the activities in which ODS should be recovered and of the most appropriate processes in order to minimize the emission of ODS.	Refri-gera-tion	
1994	Identify the appropriate destruction procedures for certain ODS.	Refri-gera-tion	
1994	Define the criteria to revise the measures based on decisions and adopted amendments by the parties in the protocol and ratified by the country.	All	

1994 to 1998	Define and adopt incentives for the CP accomplishment and provisions issued.	All	
1994 to 1998	Define and impose sanctions directly or through competent institutions, to juridic or private persons that violate the rules established by the Committee and derived from the CP.	All	

Government entities that are committed to the MP will also promote and execute the following activities:

Year	Description of Action	Sector	Intended Effect
1994	Design and implementation of an information system about customers inscribed and registered by sectors and by ODS use and possible substitutes, base of the official reports from the country to the Ozone Secretariat, and source of the necessary information required for the follow up of the CP implementation. This data base will show the tendency of imports and use of substances described in the Protocol Annexes, as well as the exports of these substances or of products that contain them.	All	
1994	Design and implementation of a specific program for the control of ODS, that serves as a technical support for the CP implementation.	All	
1994 to 1996	Implementation, in cooperation with the rest of the entities linked with the CP, of training programs and promotion campaigns destined to both technicians and personnel that uses ODS.	All	

1994 and 1995	Study of tax and financial incentives such as: + Tax exemption to production and commercialization of assets that do not contain ODS. + Tax exemption for expenditures for the industrial recycling oriented to the substitution of the ODS use. + Creation of credit lines to finance industrial recycling programs oriented to ODS use.	All	
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The Ministry of Foreign Trade, in accomplishment of its legal attribution and in conformity with provisions of the superior council of foreign trade will provide actions such as:

Year	Description of Action	Sector	Intended Effect
1994	Analysis of mechanisms to control ODS imports by: + Possible fees for importation wrights for products with or without short term substitutes. + A free importation regime but with previous licensing for importation. + Implementation of fees or duties or their elimination depending on whether the use of the substance wants to be enhance or discouraged. + Creation of a list of substances prohibited for importation, supported by the Decree 444 of 1967.	All	

1994 to 1996	Development of technical cooperation systems and identification of the difficulties or possible incentives in the international market to acquire or transfer appropriate technologies for ODS phase out or recycling.	All	
1994 to 1998	Review of the import estimate of substances listed in the MP.	All	
1994 and 1995	Study of a possible structure for the codification of the harmonized system of NANDINA.	All	
1994 to 1996	Analysis of the mechanisms to motivate imports of technology for the progressive substitution of ODS.	All	

3. Project Summary for Initial Implementation. (Draft)

Start Year	Type of Project	Project Description	Project Cost(US\$)	Implementing Agency	Tons.ODP PhasedOut
1994	1)Elimination of CFC-12 as Refrigerant by a refrigerator Manufacturer	This Manufacturer will replace CFC-12 by using HCFC-134a as refrigerant for its refrigerators.	\$3,295,269.0	UNDP	243.4
1994	2)Reconditioning of refrigerators to allow their operation with mixtures	The refrigerators operating with CFC-12 will be adapted to work with mixtures of lower ODP.	\$287,346.7	UNDP	15.4
1994	3)Elimination of CFC-11 in the insulations for refrigerators	The refrigerator insulating foams using CFC-11 will be replaced by foams using HCFC-141b.	\$487,472.4	UNDP	432.6
1994	4)Elimination of CFC-12 and Implementation of a recycling Program	CFC-12 will be replaced by HCFC-22 and the refrigeration equipment will undergo a strict recycling program.	\$148,125.0	UNDP	11.5
1994	5)Replacement of a refrigeration Equipment using ODS by a substitute one using ammonia	A refrigeration system operating with CFC-11, HCFC-22, CFC-12 and CFC-502 will be replaced by a central system using Ammonia.	\$159,830.0	UNDP	3.6
1994	6)Substitution of CFC-12 from the mobile refrigeration equipment	CFC-12 used as refrigerant for mobile refrigeration will be recycled and progressively substituted by HCFC-134a.	\$59,000.0	UNDP	2.9
1994	7)Elimination of CFC-11 from thermal insulating foams	CFC-11 used as foaming agent for thermal insulations for refrigerators will be replaced by HCFC-141b.	\$438,245.0	UNDP	474
1994	8)Transformation of maintenance service from a refrigerator manufacturer	The maintenance centers will be adapted to repair equipment using HCFC-134a, and to replace CFC-12 by mixtures with lower ODP. Personnel Training.	\$483,128.0	UNDP	603.9

1994	9) Elimination of CFC-12 as Refrigerant by a refrigerator Manufacturer	This manufacturer will substitute CFC-12 by using HCFC-134a as refrigerant for the equipment manufactured.	\$1,809,871.0	UNDP	600
1994	10) Elimination of CFC-12 as Refrigerant by a refrigerator Manufacturer	This manufacturer will substitute CFC-12 by using HCFC-134a as refrigerant for the equipment manufactured.	\$3,740,868.0	UNDP	231.7
1994	11) Elimination of CFC-11 from thermal insulating foams	CFC-11 used as foaming agent for thermal insulations for refrigerators will be replaced by HCFC-141b.	\$1,098,724.0	UNDP	952.3
1994	12) Elimination of CFC-11 and CFC-12 from the maintenance service of refrigerator manufacturer	CFC-12 will be substituted by HCFC-134a and CFC-11 by HCFC-141b in the service centers.	\$327,532.0	UNDP	65.1
1994	13) Replacement of a refrigeration Equipment using ODS by a substitute one using ammonia	A refrigeration system operating with HCFC-22, CFC-12 and CFC-502 will be replaced by a three systems using Ammonia.	\$200,000.0	UNDP	5.84
1994	14) CFC-12 elimination as foaming agent for polystyrene rigid foams	CFC-12 used as blowing agent for polystyrene rigid foams will be substituted by carbon dioxide.	\$876,319.0	UNDP	1939
1994	15) CFC-12 elimination as foaming agent for polystyrene rigid foams	CFC-12 used as blowing agent for polystyrene rigid foams will be substituted by n-butane.	\$1,766,998.0	UNDP	2222.7
1994	16) Reconversion of a compressor manufacturing plant	Compressors using CFC-12 as refrigerant will be adapted to work with HCFC-134a.	\$2,734,808.0	UNDP	443.9
1994	17) Ozone Technical Unit (Institutional Strengthening)	Assisting in implementation of the ozone protection Country Program.	\$320,000.0	UNDP	N/A
TOTAL:			\$18,233,536.1		8247.84

ii) LIST OF ACRONYMS

ACAIRE - Colombian Association of Air Conditioning and Refrigeration
ACOPI - Colombian Industrial Association
ACOPLASTICOS - Colombian Association of Plastic Industries
AMCA - Air Movement and Control Association
ANDI - National Industrial Association
ARI - Air Conditioning and Refrigeration Institute
ASRRAE - American Society of Heating, Refrigeration and Air Conditioning.
ASME - American Society of Mechanical Engineers
ASOCOLFLORES - Colombian Association of Flowers
CCS - Colombian Security Council
CFC - Chloride Fluoride Carbon
CONPES - National Council of Political and National Policies
DANE - National Statistics Department
DEPAC - Environmental Policy Division of the National Planning Department.
DIAN - National Tax and Custom Administration
DNP - National Planning Department
DES - Division of Social Studies
ECOPETROL - Colombian Oil Company
FEDEMETAL - Colombian Federation of Metallurgic Industries
HCFC - Hydro Chloride Carbon
HIMAT - National Institute of Hydrology, Meteorology and Land Adequation.
ICA - Colombian Institute of Agriculture
ICONTEC - Colombian Institute of Technical Standards
IDEMA - Colombian Institute of Agricultural & Farming Marketing
INCOMEX - Colombian Institute of Foreign Trade
INDERENA- Colombian Institute of Natural Renewable Resources and Environmental Resources
MIN-AGRICULTURA - Ministry of Agriculture
MINCOMEX - Ministry of Foreign Trade
MINDESARROLLO - Ministry of Economical Development
MINHACIENDA - Ministry of Treasure
MINSALUD - Ministry of Health
PAO - ODP (Ozone depleting potential)
PNUD - UNDP
PNUMA - UNEP
PP - CP
SADCO - ODS (Ozone depleting substances)
SENA - National Service of Apprenticeship
SIC - Superintendence of Industry and Commerce
UDE - Development Organization Unit
UN - National University of Colombia
UNCTAD - United Nations Conference on Trade and Development

iii) EXECUTIVE SUMMARY

This Country Programme presents the strategy and governmental action plan to implement the Montreal Protocol in Colombia over the next years. Colombia is part of the countries listed in Article 5 of the Montreal Protocol; since its ODS consumption percapita per year is 0.3 kg (see table 2) it is classified as developing country. Colombia will officially become part of the Protocol during the 12th Executive Committee Meeting.

The principal objectives of this Country Programme are:

- To present an assessment of the Colombian situation in relation to ODS use and consumption levels.
- To show the historical and projected future consumption of ODS.
- To propose a timetable and ODS phase-out schedule.
- To point out the estimate of the total incremental costs associated with the implementation of the Montreal Protocol and the estimate of the incremental costs associated with the first group of industrial conversion projects, that will be revised by the implementing agency and presented for approval in the month of April 1994.
- To describe the different activities involving the Colombian private and public sectors and the Multilateral Fund related to the implementation of the Montreal Protocol.

All the data, the basic information and the proposed actions mentioned in this Country Program was collected or designed by work groups constituted by private sector representatives and technical staff from the public sector. An important cooperation process has taken place in the country between the different sectors that will be affected by the implementation of the Montreal Protocol.

To date, Colombia has made a substantial progress in complying with the Protocol. The Government has taken the decision to create a Ministry of the Environment with the responsibilities that correspond to an entity of this type, in charge of the policies related to environmental preservation and sustainable use of the natural resources in behalf of improving environmental quality. This Ministry will be one of the leading agencies in the execution of the programs.

In 1989 the Superintendence of Industry and Commerce, entity appointed to the Ministry of Economical Development, emanated the resolution No.526 officializing the technical regulation over metallic containers with a maximum capacity of 1.400 cubic centimeters by which the use of Chlorofluorocarbons as propellant was prohibited for aerosols. The same year the Ministry of

Economical Development emanated resolution 02 clarifying No.526 and establishing a chronogram with six phases eliminating the use of CFC's in aerosols by the end of October 1992 in Colombia.

The total budget for ozone protection activities in the country was estimated at US\$ 54,868,536 aproximately to cover the incremnetal costs associated with the implementation of the Montreal Protocol.

1. INTRODUCTION

1.1. Objectives

This Country Programme presented by the Republic of Colombia to the Executive Committee of the Montreal Protocol, has the following objectives:

- To specify the requirements of the Montreal Protocol related to the consumption and phase out of Ozone depleting substances, as well as to accept the definitions of the concepts therein stated and all the requirements to comply with the instrument.
- To present an assessment of the Colombian situation in relation to the usage of ODS's (SADCO)¹
- To show the historical and hypothetical future consumption of ODS's (in case there was no control by the Protocol).
- To specify the applications of each one of the ODS's that Colombia imports (since the country does not produce them), in relation to the most important companies in each area.
- To point out the commitments that the Colombian Government adopted to comply with the Montreal Protocol, once the Country Programme is approved, including the following:
 - * Schedule proposed for the ODS phase-out.
 - * The operative mechanisms to guarantee the implementation of the Country Programme (CP), as a strategy to fulfill the requirements set up by the Montreal Protocol (MP).
 - * Actions proposed to stimulate and supervise the accomplishment of the CP.
- To present the action plan of the CP, in which different companies are involved, the operative program adopted, indicating the different responsibilities of the entities concerned and the strategy adopted.
- To point out the financial priorities of the CP and to present several investment projects that require financial support from the Multilateral Fund.

This CP contains all general requirements for the implementation of the MP -including the ODS phase-out timetable-, the activities undertaken by different colombian organizations, and a set of

¹ SADCO: ODS (Ozone depleting substances)

crucial projects ready to be carried out, provided funds are available. During the second semester of 1994 and on, Colombia will prepare new projects which additional costs are to be financed by the Multilateral Fund.

All the commitments acquired by Colombia through this CP, will be fully supervised by the Executive Committee of the Multilateral Fund.

1.2. Characteristics

This Country Programme has been prepared through cooperative and coordinated work between the private and public sectors. The information refers to the products consumed in Colombia, which represent a minimal fraction of the annexed product list of the MP. Some of the listed substances are exceptionally used in volumes under a metric ton. These substances are not included in the information of historical consumption, nor in the consumption forecast since their volumes are insignificant, and almost impossible to register based on the existing statistical control.

Finally, the information was compiled, complemented and organized by the ANDI in order to have a draft CP to be presented for discussion. This discussion took place on the 3rd of June 1993 in a workshop, where more than 130 organizations (companies, public institutions and some journalists) participated. The final version obtained counts with the necessary compromise from the private sector, a user of ODS, and of the public sector, which supervises the incentive and coercive instruments that will be put in place.

The CP was further evaluated by a UNEP - UNDP expert, whose recommendations were taken into account.

Regarding the Government of Colombia, the public organizations that have participated actively are: Ministry of Economical Development, Superintendence of Trade and Commerce, Incomex, National Institute of Renewable Natural Resources, Colombian Institute of Hydrology, Meteorology and Land Preparation, Colombian Agricultural Institute, National Planning Department, Ministry of Treasury and the Ministry of Foreign Affairs.

1.3. Aid received

The ANDI had an important role in the elaboration of the CP, helped by both the private and public sectors. The first provided some necessary resources for the work coordination and made contributions in kind. The public sector helped by providing support through its technical staff, aid specially important on the supervision of the projects preparation based on the MP rules.

As part of the document preparation a workshop for consultation and

final discussion of the CP was carried out. All the organizations that participated in some degree in the process were invited.

The final version of the CP was approved on the 3rd of June 1993 and has been edited by an international consultant, whose visits were fully sponsored by UNEP (Industry Office in Paris) and UNDP (New York).

The CP preparation required personnel training on technical and financial evaluation of projects to be presented to the Multilateral Fund. A workshop aiming this goal was supported by the 'Proyecto de Apoyo a la Gestion Ambiental' (UNDP - DNP) and UNEP by covering the first consultant visit. For this and other CP preparation needs, UNDP - DNP project contributed with US\$ 3,000 of a total budget available of US\$15,000.

The private sector contribution in kind and in cash for the preparation of the CP approached US\$10.000.

2. ASSESSMENT OF THE CURRENT SITUATION

2.1. Current Situation and Forecast of ODS Consumption

2.1.1. Current consumption

-Imported controlled substances

Table 3 describes (by sector of application) the historical consumption of substances controlled by the MP. All these substances must be imported because Colombia doesn't produce any of them.

-Use Refrigeration

In Colombia, CFC² -12, CFC-502 and HCFC-22 are used as refrigerants for domestic, commercial and industrial equipments as well as for refrigerated transportation, whereas the CFC-11 is only used as component of the thermal insulations of walls. Ammonia is often used as a refrigerant but there is no study that assesses the volumes used nor the size of the equipments. Commercial refrigeration applications include refrigerators, coolers, refrigerated cabinets and shop windows. Industrial refrigeration systems include refrigerated rooms, ice makers, and freezers. Equipments for refrigerated transportation are also used on trucks, with capacities from 0,51 to 40 metric tons and 0.566 cubic meter containers used for perishable products transportation.

The annual refrigerator production rate is unstable³, but it has been estimated that the country's domestic and commercial refrigeration production increases by 5% per year, whereas industrial refrigeration by 4%. In 1992, approximately 300.000 domestic refrigerators, 50.000 commercial equipments, and almost 600 industrial ones (equipments using bigger compressors) were manufactured.

Maintenance

The refrigerator manufacturing industry has created a maintenance network that uses predominantly CFC-12 and in a lower degree HCFC-22 and CFC-502 for commercial refrigeration. The use of ODS in maintenance by small service companies generates high levels of industrial waste due to the lack of training on the procedures: the pipes are dehydrated by

². CFC CloroFluoroCarbono = Chloride Fluoride Carbon

³. It is not available official figures by DANE

continuously injecting refrigerants due to the lack of vacuum pumps. The use of CFC-11 for repair of thermal insulations is not common and is less significant compared to the consumption of ODS related to equipment production.

The estimated life span of domestic refrigerators is between 15 and 20 years, and 10 years for commercial and industrial equipments. However users tend to use the equipments over a longer period of time. The investment on refrigerators represents a top priority for households, and for small commercial facilities and supermarkets.

It has been calculated that 4,000,000 domestic equipments and 340,000 commercial need maintenance every year. The experience of the maintenance service companies shows that 1.25% and 3% of the above mentioned equipment requires the gas to be refilled. All these equipments are distributed throughout 5.000 to 8.300 locations around the country. 30% of the equipments are located in Bogota, Medellin, Cali, Barranquilla, Cartagena and Bucaramanga.

Approximately 3000 refrigerated transportation units require maintenance, with an average content of 3.2 Kgs of CFC-12 and CFC-502. The life span of these equipments is approximately 15 years.

2.000 technicians work permanently in maintenance of refrigeration equipments. It is estimated however that between 6.000 and 7.000 persons work occasionally in these duties. All of them require training in new technologies. The industrial refrigerators are used by industries, agricultural industries, supermarkets and high capacity kitchens. In general these users have their own maintenance personnel. For this reason it was impossible to estimate the maintenance needs nor to differentiate between the equipments working on Chlorofluorocarbons and ammonia.

Air Conditioning

a) Static

The HCFC-22 is used for almost all static system.

Large scale projects usually use equipments working with CFC-11 (centrifugal compressors). It is estimated that there are approximately 70 of these equipments installed. The evolution of this technology, the new versatile equipments (i.e, condensing units using water) and the tendency of the users have reduced the use of CFC-11 technologies.

b) Automobile

Automobiles use CFC-12 only. The two largest automobile air conditioners installing companies (they represent 80% of the market) estimate that 150.000 units have been installed on vehicles, out of which 75.000 require yearly maintenance.

c) Mass transportation

Mass transportation only uses CFC-12 on 1500 units with an

increase of 400 units per year. Each unit uses an average of 5.5 Kgs of CFC-12 and has a 15 year life span.

Aerosols

The only aerosols containing CFC's are for pharmaceutical use and are imported. These contents of CFC are minimal in relation to the total consumption of CFC in the country.

Solvent

Carbon Tetrachloride and Methyl Chloroform are used as solvents in Colombia. Carbon Tetrachloride is used in small quantities in chemical laboratories and universities. Carbon Methyl Chloroform is used in large quantities in three applications:

- As an component in the formulation of final products. This use represents 20% of the consumption.
- For hot cleansing of metallic parts. This use represents approximately 20% of the consumption.
- For cold cleaning with aerosols or in immersion tanks. This method is used for processing textiles, shoes and metallic components. This type of applications consumed approximately 60% .

Foams

a) Polyurethane

Other than the polyurethane foam produced to insulate refrigerators, CFC-11 is also used to manufacture discontinuous and thermoformed flexible foam, whole leather, shoes, rigid foam for acoustic insulations, constructions, reaction and injection molding systems, and in the leather industry. The use of polyurethane in automobile paints is not does not need CFC presence.

b) Polystyrene

CFC-12 is injected in the last step of extrusion producing polystyrene rolls that is thermoformed later in the process to obtain diverse products after a maturity period.

Fire Extinguishers

Halon 1211 is used in mobile extinguishers, while fixed equipments use halon 1301. Those are the two types of equipment used in Colombia. During the refilling process, according to the companies that offer this service, almost 15% of the gas is lost. The current existence is estimated at 28 metric tons. The calculated existence of halon 1211 is 112 tons, applying the 1:4 ratio between the consumption of 1301 and 1211 obtained from the experience of the refilling companies.

The following table shows the market distribution in Colombia.

MARKET DISTRIBUTION OF HALONS IN THE COUNTRY

City	Halon 1211	Halon 1301
Bogota *	54%	47%
Medellin	27%	32%
Barranquilla	7%	21%
Cali	7%	
Cartagena	4%	
Bucaramanga	1%	

* The sales of smaller cities as Barrancabermeja are included with Bogota, the principal marketplace.

Carbon Methyl Bromide

The ICA authorizes the control of nematodes, fungus and ground insects using methyl bromide. Another major user of methyl bromide is the bananas sector during the quarantine treatment of fresh fruit imported by air. In the first case it is used as germicide to control the pseudomonas solanecorum applying it directly on the infection area. This use has been decreasing and is being replaced by glifosfate and vapam. In the second case the mosquitos of fruits such as the apples, pears, peaches and plums are controlled. It is also applied fumigating tobacco, plants, vegetables and organic fertilizers.

It is also used, at a lower degree, on storage grains as rice, corn and beans to control coleopters and lepidopters.

Methyl bromide is also used during the quarantine of some vegetables, even though this practice is disappearing due to its prohibition in the United States.

-Applications and Consumption of ODS:

Table 1 shows the percentages of ODS consumption according to its use. Table 2 shows the variations of annual consumption of ODS, as the consumption per capita in Colombia. The source of information were both the users and the suppliers of the substances, except for Carbon Tetrachloride, which information was obtained through the DANE. All the information has been checked and verified in order to obtain a more precise figure according to the type of application and sub-sector. The search for import registration files was unsuccessful because of the inconsistencies, found, the low reliability of the information and because all the ODS are classified in the same record under the name "Chlorofluoromethanes".

-Tendency of ODS Consumption:

The general tendency of consumption in Colombia, as it may be seen in Table 2, was to stable consumption between 1986 and 1988, and an important increase by 49% in 1989. The increase was smaller in 1989 and since 1990 the consumption of ODS started to decrease. A small increment in the demand for ODS was registered in 1992 as a consequence of the restrictions of the international market that generated an uncertainty in the marketplace of CFC's and in general ODS, forcing the importers and consumers to enlarge their inventories. In brief, the consumption of ODS has the future tendency to decrease.

2.1.2. Forecast of Consumption

Table 4 contains the historical consumption of ODS and the projection of future consumption, using different methodologies. The forecasts shown do not take into consideration the restrictions of the MP according to the elaboration guide of the Executive Committee of the Multilateral Fund. However the future consumption of ODS in aerosols is not considered since those products are CFC-free in Colombia since 1992. The values for future consumption of tetrachloride are not included because there is no present information available.

2.2. Industrial Framework

-Production

Colombia does not produce any of the substances controlled by the MP. It imports all the ODS used from countries like the United States, Great Britain, Germany and Venezuela.

-Imports of ODS or products that contain them

CFC's are provided to the Colombian consumers by 'Cabarría', representative of 'DuPont' from the United States, 'ICI' from Great Britain, 'Hoechst' from Germany and 'Electrowest' from Venezuela. Methyl Chloroform is imported by 'DOW Quimica de Colombia', a company with its Head Office in the United States.

Halons are imported by 'Proveedora Suramericana' and in lower amount by 'Solmaq', by 'Metales y Equipos', by 'Industrias Full', by 'General Fire' and by 'Camasco' from Germany, Great Britain and the United States. At present the only source are the United States. Some users of static fire extinguishing equipment buy halons directly to the international market.

Methyl Bromide is imported by 'Electrofumigacion Toro', by 'Idema', by 'Quaker' and by the banana growers of the Uraba zone from the United States.

-Users

ACAIRE groups 95 refrigeration and air conditioning companies, that represent 80% of the air conditioning market. All the

TABLE 2

ANNUAL (ODP tons) AND PER CAPITA (ODP kg) CONSUMPTION
OF ANNEX A OZONE DEPLETING SUBSTANCES

14/1/94

YEAR	CFC-11	CFC-12	CFC-115 1/	HCFC-22 2/	HALON		TOTAL ANNEX A ODS	ANNUAL VARIAT.	POPULAT. ESTIMATE (mill.)	PER CAP. CONSUM. (kg)
					1211	1301				
1986	278	908	8	22			938	-14.8	30.0	0.03
1987	267	780	3	16			799	8.7	30.6	0.03
1988	273	844	5	20			869	71.7	31.1	0.03
1989	327	1199	13	38	153	110	1491	27.8	31.7	0.05
1990	377	1521	15	42	108	220	1906	-10.5	32.3	0.06
1991	318	1279	15	42	129	240	1705	-4.0	32.8	0.06
1992	330	1374	13	40	60	150	1636		33.4	0.05

14/1/94

1/ R-115 is used through the azeotropic R-502, which contains 48.8% of R-115 and 51.2 of R-22

2/ The figures include both direct consumption and the correspondent part in R-502.

TABLE 4 - ODS CONSUMPTION AND FORECAST BY USE AND APPLICATIONS

SECTOR	SUBSTANCE	APPLICATION	HISTORICAL CONSUMPTION ^{1/}										CONSUMPTION FORECAST ^{2/}									
			1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010	2015		
Aerosols	CFC-11	Container filler	180	120	100	80	70															
	CFC-12	Container filler	220	180	160	130	120															
Polyurethane foams	CFC-11	Flexible moulded foam	2	2	3	4	6	8	3	3	3	3	4	4	4	4	5	6	8			
	CFC-11	Integral skin Footwear	4	4	6	6	6	11	14	9	11	12	13	15	16	20	26	33	39			
Polystyrene foams	CFC-12	Moulded foams blowing	111	113	160	176	187	198	210	272	321	404	492	636	756	844	941	1166	1322			
																			1605			
Total consumption CFC and HCFC	CFC-11		278	267	273	327	377	318	320	376	404	428	466	486	519	558	560	761	927			
	CFC-12		808	780	844	1180	1621	1278	1374	1592	1792	1890	2045	2133	2373	2557	2667	3461	4261			
	CFC-502		26	11	17	44	62	51	44	64	61	64	81	66	66	66	71	93	113			
	HCFC-22		172	182	206	242	271	280	302	342	392	391	367	422	445	456	466	606	720			
Fire extinguish- ing systems	Halon 1211	Portable fire extinguisher				61	36	43	20	26	20	14	7	7	8	8	8	8	8			
	Halon 1301	Fixed fire exting. syst.				11	22	24	16	22	23	26	26	28	30	31	32	40	47			
Solvents	1,1,1-tri- chloroeth	Metal cleaning and final product preparation			315	300	267	200	200	180	150	100	80	80	20							
	Carbon tetrachlor- ide	Chemical labs, universities, some industrial processes						13	24													
Pesticides	Methyl bromide 3/	Insecticide, fungicide, storage, quarantine					205	218	371	430	613	864	877	756	842	923	1038	1417	1828			

1/ In metric tonnes

2/ As no figures are available for other years it is impossible to calculate forecasts.

3/ Figures in tonnes were obtained multiplying original values in litres and methyl bromide's specific weight (1.76)

TABLE 4 - ODS CONSUMPTION AND FORECAST BY USE AND APPLICATIONS

14/7/84

SECTOR	SUBSTANCE	APPLICATION	HISTORICAL CONSUMPTION										CONSUMPTION FORECAST									
			1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010	2015		
Refrigeration	Domestic	Polyureth isolating foaming	70	81	87	86	100	86	100	132	150	176	197	218	238	250	279	335	411	487		
		Refrigeration system charge	111	135	94	85	100	89	103	136	165	187	210	232	254	277	300	343	418	480		
	Commercial	Polyureth isolating foaming	10	13	15	13	21	17	25	27	28	30	31	33	34	36	38	52	62	72		
		Refrigeration system charge	28	32	31	27	30	29	36	38	40	42	44	46	48	51	53	58	68	77		
Industrial	CFC-11	Refrigeration system charge	8	6	6	16	21	18	17	18	19	20	21	22	23	24	25	32	38	43		
		Refrigeration system charge	24	24	47	118	103	177	185	172	178	186	193	201	206	218	226	321	391	460		
	CFC-12	Refrigeration system charge	32	32	31	34	33	36	75	78	81	84	88	91	95	99	103	138	168	198		
		Refrigeration system charge	2	2	4	10	13	15	14	15	16	16	17	18	18	19	20	28	35	41		
Total by ODS in refrigeration	HCFC-22	Refrigeration system charge	19	19	20	20	20	20	27	28	28	30	31	33	34	35	37	44	51	56		
		Refrigeration system charge	104	128	149	217	274	282	290	331	363	392	421	452	481	513	545	708	864	1019		
	CFC-11	Refrigeration system charge	171	199	196	149	172	178	218	261	288	313	342	369	397	427	450	539	652	785		
		Refrigeration system charge	10	8	12	26	34	33	31	33	35	38	38	40	41	43	45	61	73	84		
Air conditioning	CFC-11	Charge of centrifuge compressor systems and large water chillers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
		Automobile air conditioners	14	14	14	15	17	20	21	21	23	24	26	27	28	29	31	37	44	50		
	HCFC-22	Fixed air conditioners	38	41	42	63	60	64	66	76	81	87	92	98	104	110	115	144	173	202		
		Fixed air conditioners																				
Maintenance Refrigeration	CFC-11	Dehydration of refilling and isolation foam repairing	8	1	8	10	8	8	6	10	8	8	8	5	8	13	13	12	14	18		
		Refrigerant syst recharge	315	187	287	628	631	774	808	887	1003	988	1051	949	1033	1080	1064	1512	1808	2105		
	HCFC-22	Refrigerant syst recharge	16	3	5	16	16	16	13	21	18	18	23	26	28	23	26	34	40	46		
		Recharge of some commercial systems	36	26	36	46	61	67	48	64	64	72	66	62	64	56	64	81	93	104		
Air conditio	CFC-11	Centrifuge systems recharge	8	11	8	6	11	11	9	8	8	8	8	8	8	8	8	9	9	9		
		Automobile air cond recharge	77	77	77	86	84	111	116	121	126	137	144	152	156	167	175	216	254	290		
	HCFC-22	Fixed air condit recharge	78	90	100	123	140	146	156	175	188	202	215	228	243	255	269	336	403	471		
		Fixed air condit recharge																				

TABLE 5 - ODS CONSUMPTION AND FORECAST IN TON-ODP BY USE AND APPLICATIONS

SECTOR	SUBSTANCE	APPLICATION	HISTORICAL CONSUMPTION /										CONSUMPTION FORECAST /									
			1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010	2015		
Refrigeration - Domestic	CFC-11	Polyurel isolating foaming	70	91	87	86	100	86	100	86	100	130	150	176	197	218	236	259	278	335	411	487
	CFC-12	Refrigeration system charge	111	135	94	85	105	89	100	130	165	187	210	232	254	277	300	343	410	480		
	CFC-11	Polyurel isolating foaming	10	13	16	13	21	17	26	27	28	30	31	33	34	36	38	52	62	72		
	CFC-12	Refrigeration system charge	26	32	31	27	30	36	36	38	40	42	44	46	48	51	53	58	66	77		
	HCFC-22	Refrigeration system charge	3	2	3	6	7	6	6	6	6	7	7	7	8	8	10	12	14			
Commercial	CFC-11	Polyurel isolating foaming	24	24	47	118	153	177	165	172	179	180	183	201	209	218	220	321	391	460		
	CFC-12	Refrigeration system charge	32	32	31	34	33	66	75	78	81	84	86	91	95	99	103	136	166	196		
	CFC-12	Refrigeration system charge	1	1	1	3	4	6	4	6	5	5	5	6	6	6	6	9	11	13		
	CFC-12	Refrigeration system charge	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3		
	HCFC-22	Refrigeration system charge	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3		
Total by ODS in refrigeration	CFC-11	Polyurel isolating foaming	104	126	148	217	274	262	290	331	363	382	421	462	481	513	543	708	864	1019		
	CFC-12	Refrigeration system charge	171	190	156	146	172	178	218	261	286	313	342	366	397	427	456	530	632	765		
	CFC-12	Refrigeration system charge	3	3	4	8	11	11	10	11	11	12	12	13	13	14	14	20	23	27		
	CFC-12	Refrigeration system charge	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3		
	HCFC-22	Refrigeration system charge	279	331	310	373	408	470	517	564	602	718	777	836	893	956	1016	1260	1542	1814		
Total CFC and HCFC in refrigeration Air conditioning	CFC-11	Charge of centrifuge comp- ressor systems and large water chillers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
	CFC-12	Automobile air conditioners	14	14	14	15	17	20	21	21	23	24	26	27	28	29	31	37	44	50		
	CFC-12	Automobile air conditioners	2	2	2	3	3	4	4	4	4	6	6	6	6	6	6	8	10	11		
	CFC-12	Fixed air conditioners	17	17	17	18	21	25	26	26	28	30	32	33	35	36	38	46	55	62		
	HCFC-22	Fixed air conditioners	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Total CFC and HCFC in air condition Maintenance Refrigeration	CFC-11	Dehydration of refilling sys. and isolation foam repairing	6	1	6	10	8	6	6	10	8	9	9	8	8	13	13	12	14	16		
	CFC-12	Refrigerant syst. recharge	315	187	287	628	631	774	808	867	1003	1088	1081	948	1033	1090	1084	1512	1800	2105		
	CFC-12	Refrigerant syst. recharge	6	1	2	6	6	6	4	7	6	6	7	8	9	7	8	11	13	15		
	CFC-12	Refrigerant syst. recharge	2	1	2	3	3	3	3	4	3	4	3	3	4	3	4	4	5	6		
	HCFC-22	Recharge of some common sys.	2	1	2	3	3	3	3	4	3	4	3	3	4	3	4	4	5	6		
Air conditio Maintenance	CFC-11	Centrifuge systems recharge	9	11	9	9	11	11	9	9	9	9	9	9	9	9	9	9	9	9		
	CFC-12	Automobile air cond. recharge	77	77	77	85	94	111	119	121	126	137	144	152	156	167	175	215	254	293		
	CFC-12	Automobile air cond. recharge	4	6	6	7	8	8	9	10	10	11	12	13	13	14	15	18	22	26		
	CFC-12	Fixed air condit. recharge	420	264	366	740	1086	918	957	1057	1167	1183	1234	1139	1255	1304	1288	1782	2120	2469		
	HCFC-22	Fixed air condit. recharge	420	264	366	740	1086	918	957	1057	1167	1183	1234	1139	1255	1304	1288	1782	2120	2469		
Total CFC and HCFC in maintenance																						

representative companies for refrigerant and solvents are affiliated to the ANDI, altogether with ICI representing more than 80% of the ODS market.

The firms that dominate the production, import and export of home refrigerators are also affiliated to ANDI, like Phillips, Haceb, Corelsa and Icasa (consumers of 11.4% of the ODS imported and major manufacturers of industrial and commercial refrigerators and air conditioners).

The foaming and solvent-using companies, polymer blowers, who's expansion require ODS, are not organized in any specific association.

The maintenance sector includes several companies that have their own service centers and maintenance equipment, and a great number of small independent service agencies.

-Refrigeration

a) Domestic refrigerators

It is the most developed sector, where the national production is fully represented by 'Corelsa', 'Haceb', 'Icasa', and 'Philips Electrodomésticos'. All these industries are nationally owned, except 'Philips'.

The industry imports some raw material and some parts (most of the parts are Colombian made) and is supplied in a high percentage with 'Compresores Andinos, a factory that supplies the market with an annual average of 300.000 hermetical compressors for domestic refrigeration. This company is a multinational with Colombian partners.

b) Commercial

There are five Colombian companies that share 15% of the market. 'Priomex', 'Industrias Inducol', 'Supernoridco' and 'Wonder'. There are also between 50 and 100 small companies, that share another part of the market.

c) Industrial

Excepting 'Mycom', which is a Japanese firm, the other companies belonging to this sector are private Colombian firms. The most important companies that stand in the market are: 'Colser', 'Polares', 'Frigocol', 'Westell', 'Rojas Hermanos', 'Western', 'Industrial', 'Prit' and 'Dartico'. All these companies work with imported compressors and assemble those units in Colombia. The compressors are mainly imported from the United States, Italy and France.

The diffusers are assembled by nearly all the companies with coils and aluminum plates both manufactured in Colombia. Some diffusers of special size are imported from the United States. The companies that build refrigerated rooms use their own national knowledge, therefore not having to pay royalties. The machinery required to manufacture refrigerated rooms in the

volume required by the country is basic. In some cases the equipment is sophisticated since they are also used for manufacturing commercial refrigeration.

d) Refrigerated Transportation

All the equipment for refrigerated transportation is imported, mainly from the United States. The principal company is Thermoking, represented by 'Termo Rex S.A.' in Colombia, but some equipment from Carrier and Lemmon was also imported. The value of the imports in this sector has doubled in the last three years. The market of refrigerated transportation equipment for perishable products is also growing at an important rate. There are presently around 300 of these equipments working in this sector.

-Air conditioning

'Incelt' manufactures air conditioning systems for buildings using Toshiba technology. Some other companies as 'Páramo', 'Colclima', 'Equiprac', 'Termoandina' are working with Carrier and York International technology.

Mass transport has expanded during the last ten years, importing the equipments from the United States. The principal trade marks are Thermoking represented in Colombia by 'Thermo Rex', sharing 70% of the total market, and Carrier, Suntrak and Calaires. The companies have developed their own designs, except for Toshiba, but the technologies used to manufacture these items are imported from the United States, and technical standards extracted from the ASME, ANSI, AMCA, ARI and ASHRAE codes are used for reference.

-Maintenance

The maintenance sector is constituted by:

a) Companies specialized in home appliances maintenance are small and with limited importance in the area of domestic and commercial refrigeration. They only cover 2% of the equipment population.

b) Companies specialized in the production of refrigeration and air conditioning equipment as well as maintenance, manufacture domestic refrigerators (HACEB, PHILLIPS and CORELSA), do the maintenance services and cover their manufactured apparatus: from a 93% and 85% of the machines produced for the first two firms to 40% percent for the last one. The average coverage of these companies has been estimated at 62%. The service structures are different, the most common being contracts with third parties, named authorized servicemen, and receive logistic support. The largest companies have mixed service, through direct and indirect service. It is estimated that these companies count with 250 specialized technicians.

There are approximately 100 technicians involved in air conditioning maintenance services, and 80 specialized in

refrigerated transportation.

c) The number of independent persons that don't own companies, and don't belong to service groups, with low specialization that give maintenance to domestic, commercial and industrial refrigerators. is estimated between 6.000 and 7.000. These are frequently learners with no equipment who generally do not use the correct procedures nor offer a good service. They service 36% of the population of domestic and commercial refrigerators. They consume refrigerants in excess in relation to the equipment they service.

d) Big industrial users have their own personnel and maintenance plants according to their production volume. They are supplied by the main distributors of substances.

e) Commercial companies that distribute gases and components for refrigeration equipment. They supply the independent maintenance people and sometimes give technical assistance.

f) Universities and refrigeration training centers, Sena (National Apprenticeship Service) being the most important one with seven centers around the country, authorized to prepare about 120 technicians per year, under two year programs. Some institutes are smaller and have training courses that last only some hours.

-Aerosols

After the promotion of the law towards the elimination of the CFC as aerosol-propellant (see 2.5), the container filling service is done in 95% of the cases, by two companies: 'Reticol' in Barranquilla and 'Destisol' in Medellin. Nowadays companies in Colombia are using propellant substances that do not destroy the ozone layer, like Dimethyl-ether.

-Foams

a) Polyurethane

The big national flexible foam manufacturing companies do not use CFC. They're located in Bogota ('Solvenco' and 'Espumados S.A.') and in Medellin ('Espumas Plasticas'). The molded flexible foam producing national companies are located in Bogota: 'Espumlatex', 'Prensiplast', 'Challenger' y 'Series'. Other producers located in Bogota are: 'Espumlatex', 'Prensiplast', 'Series' and 'Challenger'. 'Multipartes' operates in Cali and 'Polifor' in Duitama. The technologies are imported and the manufactures of raw material are expected to make the necessary changes in order to eliminate the usage of CFC.

b) Polystyrene

Polymer based foam products are 100% in charge of two

Colombian companies: 'Ajoever' and 'Industria Nacional de Desechables', 'Inaldes'. Both companies are ready to implement CFC free technologies as soon as possible.

-Solvents

3% of Methyl Chloroform users in the country correspond to multinational corporations. The other 97% corresponds to national industries that use this product for cleansing. Approximately 50% of the consumers use 80% of the total amount of Methyl Chloroform.

-Fire Extinguishers

Manually operated fire extinguishers use halon 1211, which is commercialized mainly in Bogota by 'Tecnigases', 'Incoldexi', 'Extintores America', 'Metales y Equipos', 'Industrias Full', 'General Fire' and 'Pirotec'; in Medellin by 'Impleseg', 'Accequip', 'El Rapido', 'Represege' and 'Hergas'; in Cali by 'Solmaq', 'Gaserva' and 'Super'. In Barranquilla by 'Tecnofuego' and 'Conseguridad'; In Cartagena by 'Solmaq' and 'Solsed'; in Bucaramanga by 'Soldogas'.

Fixed fire extinguishing equipments are imported and installed by national and foreign companies.

2.3. Institutional Framework

-Organizations

Several public organizations are involved in the application and supervision of the environment legislation. Because of the requirements of the MP, it will be necessary to adopt new environmental standards in different areas, including all organizations that cover the different Protocol areas.

As a consequence of this, an inter-institutional agreement will be signed by the Ministers and Presidents of the group representatives of the different sectors in order to start the phase out program established in the CP and the MP.

The operative scheme in place can be observed in Section 3.3. It will enhance the decisions taking process and the cooperation between the public and private organizations.

The above mentioned agreement offers the mechanisms that will join together the following organizations:

-From the public sector:

The Ministry of Economical Development, the Ministry of Foreign Trade, the Ministry of Treasury, the National Planning Department, the Ministry of Foreign Affairs, the Ministry of Health, the National Institute of Renewable Natural Resources and Milieu - INDERENA- and the entities associated and related to the ministries and related with the application of MP such as the Superintendence of Industry and Trade INCOMEX and the National Board for taxes and customs -DIAN

-From the private sector:

The National Association of Industries -ANDI-, the Colombian Popular Association of Industries -ACOPI and the Colombian Association of Air Conditioning and Refrigeration ACAIRE, the Colombian Federation of Metallurgic Industries - FEDEMETAL - the Colombian Association of Flowers -ASOCOLFLORES - the Colombian Association of Plastic Industries -ACOPLASTICOS - Colombian Security Counsel - CCS -, and the Colombian Institute of Technical Standards -ICONTEC.

-Compromises and responsibilities

Each one of the above mentioned entities have certain established functions, which are related to each type of organization according to the CP and the MP. In general the actions related to those functions will be associated in agreements stipulated to guarantee the application of the CP and MP (see section 3.3).

The following pages describe briefly the functions and responsibilities of the different entities:

MINISTRY OF ECONOMICAL DEVELOPMENT 1) Shall formulate an industrial and agricultural policy that respects and complies with the national and international compromises that Colombia acquired for environmental protection. 2) Shall design and adopt the legal and administrative measures necessary to discourage the ODS consumption by the national industry and to encourage the reduction and phase out process, trying to substitute ODS by substances that don't destroy the ozone layer in the cases in which this substitution is possible. 3) Shall seek for domestic and international financing sources to enhance the industrial transformation of needful sectors. 4) Shall analyze the connotation that the compliance with the international regulations foreseen in the Montreal Protocol have for Colombian industry. 5) Shall define and design, in coordination with the DNP, strategies that allow industry groups and enterprises involved to have access to resources of the International Technical Cooperation, binational and multinational sources to develop studies and projects related with the MP. 6) Shall define in agreement with the DNP and the representatives of the national industry based on the government development policies and the needs of industry, the sectorial priorities of investment of the resources from the Multinational Fund of the MP and other financing sources (technical cooperation, binational funds, and other multinational and national ones) [7) Shall create and coordinate the Industrial committee for Milieu that will take care of compliance evaluation of the regulations adopted by the MP.] [8) Shall preside the Technical Secretary for the application of the MP.]

MINISTRY OF FOREIGN TRADE 1) Shall formulate, direct, coordinate, execute and supervise the foreign trade policies adopted in relation to ODS. 2) Shall propose procedures and requisites for the importation and exportation of ODS. 3) Shall present to the High Counsel for foreign Trade proposals in relation to policies,

strategies and programs of the National Government on the subject of ODS Foreign Trade. 4) Shall interpret the customs regulations and Foreign Trade ones related to the ODS. 5) Shall analyze the implications that the fulfillment of the MP obligations will have on Foreign Trade.

MINISTRY OF TREASURE 1) Shall prepare, in coordination with the Ministry of Foreign Trade and the Special Administrative Bureau of Taxes and Domestic Customs and through the Committee for Taxes and Customs Affairs and Foreign Trade, the studies to be presented to the High Counsel for Foreign Trade so that the government can adopt customs, valuation policies as well as new custom regimes and import and export procedures for ODS.

NATIONAL PLANNING DEPARTMENT 1) Shall elaborate the industrial and technological programs and policies, will collaborate in pollution control and foreign trade in respect to the compromises acquired by Colombia through the Montreal Protocol 2) In coordination with the Ministry of Economic Development, shall promote the procure of international technical cooperation resources of binational and multinational institutions to be assigned to the ODS reduction and final elimination by the industrial groups and organizations.

MINISTRY OF FOREIGN AFFAIRS 1) Shall be the nexus between the international organizations related to the Montreal Protocol such as the United Nations Development Program and the United Nations Environmental Program, the Ozone secretary and the other Offices of the United Nations with the entities that belong to this Committee and the ones involved in the implementation of the CP in Colombia. 2) Shall provide information related with the fulfillment of the MP and its amends. 3) Shall obtain the information related to the meetings of the parties in the Protocol, the decisions that will be adopted and their implications. 4) Shall request information or specific data to the organizations of the United Nations system, that are in charge of supervising the accomplishment of the acquired compromises by the Protocol parties regarding its execution in relation to the controlled substances and the date in force established by the Protocol. 5) Shall inform about the meetings in which the parties participate, and present a report of the missions of New York and Geneva. The Chancellery will communicate, if possible, to this committee and to the official organizations the regular meetings in order to comply with the outline of the technical and diplomatic delegations.

MINISTRY OF HEALTH 1) Shall formulate the policy and execute a control (through the sectional secretaries) over ODS in pharmaceutical and cosmetic products. 2) Shall define and control the essential uses whereby ODS will be necessarily require.

MINISTRY OF AGRICULTURE 1) Shall formulate a reduction and final elimination policy of the Methyl Bromide use in the Sector.

ICA 1) Shall control and supervise the fulfillment of the Ministry of Agriculture policies on the subject of the use of Methyl Bromide in the agricultural sector. 2) Shall study and propose to the Ministry of Agriculture substitution alternatives for Methyl Bromide. 3) Shall support the Methyl Bromide users with the most adequate alternatives of substitution. 4) Shall comply with the chronogram adopted in the country for the ODS phase out. 5) Shall propose rules regarding the fulfillment of the country compromises with the MP on the subject of Methyl Bromide and take the legal decisions to assure the actor this agreement.

INDERENA (or the Ministry of the Environment when operating) Shall formulate and develop research projects to define the consequences that the changes on ozone concentration and the increase on ultraviolet radiation could cause over the natural renewable resources and the environment on the national territory. 2) Shall propose a national policy to the Government in relation to the research, administration, conservation, development of natural renewable resources and environment in order to minimize the eventual negative effects by the change on the ozone layer 3) Shall execute the general and specific natural renewable resources and preservation of the national territorial and environmental Government policies. 4) Shall inform, train and enhance promotion activities related to the preservation and development of renewable natural resources as to the conservation of the environmental quality. 5) Shall define the evaluation of the environmental criteria for the introduction of new substances, as to the use of new production technologies.

ANDI, ACOPI, ACAIRE, ACOPLASTICOS, ASOCOFLORES, FEDEMETAL 1) Shall participate in the Technical Secretariat for the Execution of the Montreal Protocol, created to coordinate and promote the realization of the CP and also to make decisions that pertain to the program. 2) Shall represent the affiliates on the work groups when required to do so. 3) Shall enhance the technological assistance to the industries that require it 4) Shall participate in the implementation and decisions concerning the mechanism adopted for the execution of the resources obtained from the Multilateral Fund of the Montreal Protocol, the Technical Cooperation and the bilateral or multilateral sources. 5) Shall support the project elaboration for the MP 6) Shall serve as nexus, when needed, between the official entities that take part in the committees and the private entities that have a compromise with CP. 7) Shall support the process of promoting and training personnel in the achievement of the programs and agreements required by the MP granted in the CP.

COLOMBIAN SECURITY COUNCIL 1) Shall participate in the Technical Secretary for the Implementation of the Montreal Protocol, created to coordinate and promote the realization of the CP and to make decisions related to the program. 2) Shall represent the affiliates on the work group related to fire extinguishers when required to do

so, and promote the attainment of the CP. 3) Shall promote the technological assistance to the industries that require it. 4) Shall participate in the organization and decision of the structure adopted to make use of the resources obtained from the Multilateral Fund of the Montreal Protocol, from the Technical Cooperation and the Bilateral or Multilateral financing sources; 5) Shall support the programs and the project evaluation process for the MP; 6) Shall serve as nexus, when it is needed, between the official entities that are part in the committees and the private entities that have a compromise with the CP; 7) Shall support the process of promoting and training personnel in the achievement of the programs and agreements required by the MP granted in the CP.

ICONTEC 1) Shall establish the quality and technical regulations for products that contain ODS, the related technologies and the substitutes; 2) Shall participate in the Technical Secretary for the Implementation of the Montreal Protocol, created for coordinate and promote the realization of the CP and also making decisions related to the program.

NATIONAL TAX AND CUSTOM ADMINISTRATION 1) Shall execute the policies on the subject of customs, tariffs, values and importation and exportation ODS; 2) Shall be in charge of custom control of ODS importation.

HIMAT 1) Shall operate and maintain the network for meteorological observation in the country; 2) Shall compile, process, analyze and interpret all the meteorological data; 3) Operate the ozone measurement and the ultraviolet radiation station; 4) Shall disseminate meteorological and climatological information; 5) Shall develop studies and research on the Ozone layer and ultraviolet radiation levels.

SUPERINTENDENCE OF INDUSTRY AND COMMERCE 1) Shall execute and control the policies and procedures approved by the Ministry of Development; 2) Shall propose decisions or regulations to supervise the compliance of the ODS substitution for national and imported products to the Ministry of Development. 3) Shall propose some certification programs executed by laboratories and organizations that will create in the country an appropriate structure to quantify ODS presence, when their use is prohibited.

INCOMEX 1) Shall execute the policies concerning the importation and exportation of goods, technology and services, designed by the Council of Foreign Trade and the Ministry of Foreign Trade; 2) Shall serve as a logistical, technical and financial support unit for the fulfillment of the assigned functions to the Ministry of Foreign Trade; 3) Shall record all the imports of goods that are included in the free importation system and approve or reject the applications issued to obtain the corresponding license.

SENA 1) Shall develop CP related capacity building and training projects for technicians.

NATIONAL UNIVERSITY OF COLOMBIA AND OTHER UNIVERSITIES. The National University will promote research, training and technological development related to the MP. Through the Engineering Faculty it will participate in the following activities 1) Diffusion among students and teachers of the latest information related to substitute refrigerants for CFC's; 2) Professional technical training on environmental control and the latest refrigeration technologies; 3) Promotion of research and investigation in the refrigeration and air conditioning area intended to use substitute refrigerants; 4) Funding of studies and special projects for governmental institutions and industries; 5) Participating on environmental control committees and events.

-National Commission for the Ozone Layer preservation

A National Commission for the Ozone Layer preservation that works as a Consultant staff of the National Government, appointed to the Ministry of the Environment will be created.

The National Commission for the Ozone Layer preservation will be integrated in the following way:

By the Governmental Sector:

1. The Ministry of Agriculture or who in the future acts as a legal representative of the entity in charge of the of the environmental matters.
2. The Ministry of Economical Development or his representative, who will act as Vice-president.
3. The Ministry of Foreign Affairs or his representative
4. The Ministry of Treasury and Public Credit or his representative.
5. The Ministry of Foreign Commerce or his representative
6. The Ministry of Health or his representative
7. The Director of the National Planning Department or his representative.
8. The Ministry of the Environment or his representative.

By the private sector: Four representatives.

The National Commission for the Preservation of the Ozone Layer will have the following responsibilities:

- a. To act as consultant Body and consultant of the National Government, in order to fulfill the acquired compromises by virtue of the Vienna Convention, the Montreal Protocol and all the agreements that in the future Colombia approves and which purpose will be the Ozone Layer preservation.
- b. Present under the Government consideration the reports that must be submitted to the Executive Committee Secretary ' Multilateral Fund of the Montreal Protocol.
- c. Recommend programs and participation mechanisms of the public and private entities in order to comply with the Vienna Convention of the Montreal Protocol, the Country Program and other mechanisms, which objective will be the Preservation of the Ozone Layer.
- d. Present to the National Government, recommendations about the decisions that must be taken for the fulfillment of the Convention of Vienna, the Montreal Protocol and also the position that the Government will adopt in the Montreal Protocol meetings.
- e. Formulate the corresponding request to the appropriate entities according to the nature of the National Government recommendations and decisions.
- f. Recommend that administrative and juridical regulations be adopted in order to comply with the Montreal Protocol.
- g. Promote and support promotion and training programs related to the Ozone Layer, the ODS, the technological changes and the means for achieve it, so that the Montreal Protocol and the Country Program are fulfilled.
- h. Suggest to the National Government the creation of technical subcommissions in charge of specific subjects related to the Ozone Layer preservation and the Montreal Protocol implementation.
- i. Recommend to the Ministry of Foreign Affairs the creation of official delegations so international settlements regarding the Ozone Layer preservation could set up.

2.4 Policies for ODS Phase Out.

The National Planning Department in compliance of its obligations of environmental policy formulation, approved the "Environmental Policy for Colombia" by the National Council on Economic and Social

Policy on the 1st of August of 1991 (Conpes document DNP-2544-DEPAC). The Government has taken the decision to create a Ministry of the Environment with the responsibilities that corresponds to an entity of this type, in charge of the policies related to environmental preservation and sustainable use of the natural resources in behalf of improving environmental quality, supported by the participation of the direct users of these resources.

The Government has also approved the law that ratifies the Montreal Protocol as a part of other international instruments on which Colombia takes part.

A new environmental regulation has been adopted so that the process modernization of the country counts with the adequate framework, specially in the environmental area. It was perceived that an industrial transformation and modernization is necessary in order to achieve the environmental goals. A Support Unit for Industrial Pollution Control, whose principal function is to formulate and to evaluate the transformation projects has been set in place through the cooperation of the World Bank. This unit will be the nexus between the DNP and the CP and will participate in the implementation process.

The institutional modernization is part of the environmental policy, including the creation of the Ministry of Environment, and in the other hand, fortifying the environmental public entities, associated to the Ministry of the Environment, increasing the interlocutors and facilitating the actions of the productive sector towards appropriate environmental management.

The Ministry of Economical Development on the 28th of April 1993, supported by the National Planning Department, obtained the approval of the document Conpes-Ministry of Development DNP-2652 Ude-Des, titled "Actions towards Industrial Modernization".

The policy established in this document is summarized in the following industrial modernization principles:

- The Government is responsible for creating a macroeconomic and technological environment with the adequate infrastructure for investment and competitiveness.
- The private sector must lead the investment, the modernization and the marketing processes.
- The promoting regulations and disposition should be neutral.
- There should be affinity between the policies of structural change and the necessity to reduce investment costs.
- The regional industrial development must be promoted by both the private and public sectors.

The foreseen industrial measures in process for Protocol purposes are:

- The activation of the "Industrial Environmental Committee".
- The opening of credit lines for the technological innovation.
- The design of special training programs.
- The arrangement of agreements in order to enhance non-compulsory initiatives.
- The promotion of clean technologies and technological changes of polluting industries to non-contaminating ones.
- Coordinated actions by the government and private groups assisted by the scientific community in order to:

- * Prepare the amendments of the Natural Resources Code and its regulations in regard to the environment pertinent to the industry.

- * Analyze the necessary incentives to encourage the process required comply with the regulations.

- * Evaluate the international regulation fulfillment such as the MP.

- * Adequate the environmental requirements of project evaluation.

On the subject of Foreign Commerce and Environment, the Ministry of Foreign Commerce in coordination with the National Planning Department are conceiving the corresponding policy.

2.5 Government and Industry Reactions to the Protocol

- Signature Dates and the ratification of the Protocol

Colombia didn't sign the Protocol in 1987. However the country ratified it at the 1985 Convention of Vienna for the protection of the Ozone Layer by virtue of Law 30 1990, instrument of national implementation that entered in force the 14th of October of the same year.

On the 28th of December 1992 the Law 29 was approved by Congress ratifying the Montreal Protocol, together with the amendments of London and Copenhagen, of 1990 and 1991. The 8th of March 1993 the constitutionality study of Law 29 by the Constitutional Court ended, and this entity emanated the verdict on the 9th of September 1993 approving the attainable Law.

In February 1994 the Law was presented to the General Secretary of the United Nations in New York. Colombia will officially become a part of the Montreal during the 12th Executive Committee Meeting.

- Governmental Phase-out Strategies already in place.

In 1989 the Superintendence of Industry and Commerce, entity appointed to the Ministry of Economical Development, emanated resolution 526 officializing the technical regulation over metallic containers with a maximum capacity of 1.400 cc by which "the use of Chlorofluorocarbons as propellant" was prohibited for aerosols. The same year the Ministry of Economical Development emanated resolution 02 clarifying the 526 in the sense of prohibiting the use of Chlorofluorocarbons and establishing a chronogram with six phases eliminating the use of CFC's in aerosols by the end of October 1992 in Colombia. This program was achieved successfully.

A supervision system for propellents is being installed by the National University of Colombia under the direction of the Superintendence of Industry and Commerce, to guarantee that aerosols produced in Colombia and imported ones are CFC free.

The ICA started in June 1993 a program with the consumers of Methyl Bromide (banana and tobacco producers, importers of fresh fruits) to inform about phase out strategies and implement a reduction plan heading towards final elimination of this product. Some banana producers have done some research, allowing them to substitute Methyl Bromide by glifosfate or vapam.

- Organizations created to manage the Protocol matters

The CP formulation was made on the basis of an Ad-Hoc structure, including the Ministry of Development, Inderena the ANDI and others, with the participation of companies associated to the ODS problem, as well as the Ministries and public institutions related to the subject. The work was coordinated by an Ad-hoc Committee in charge of the execution of the Protocol, who divided the CP responsibilities into the private sectors and the public sector. At the beginning 11 work groups were constituted but were reduced to 6. With the collaboration of each group and under a tight schedule, the CP was elaborated. Because the country is involved in a modernization process, it considers sufficient having a Technical Secretariat handling the Protocol implementation and the CP accomplishment. Starting in 1994 it will count with the support of the future Ministry of the Environment. This Ministry will assume the corresponding leadership through work patterns designed to achieve the CP and to implement the agreements established in the MP. The institutional Colombian position regarding the successful CP formulation, is to work on the basis of an administrative governmental scheme, taking advantage of the responsibilities that the state organization has established working with the private sector, an important actor in the MP implementation. To obtain a good effort combination, an inter-institutional scheme has been designed with the participation of the private and public sectors, according to the strategy established by the policy of "Actions for the industrial modernization" (see numeral 2.4), that can be seen

in detail in section 3.3 of this document.

- Requested and Received Aid

Cooperation was requested from the private and public sectors involved with environmental control and industrial ODS use, for the elaboration of the CP. The first sector helped by providing the information required to coordinate the efforts and by contributing in kind. The entities from the public sector made the corresponding contributions and supported the whole process of the CP elaboration.

In order to finish the document, a workshop for consultation and final discussion of the CP was carried out. All the relevant organizations were invited.

The final version of the CP was approved by consensus and has been edited in all its financial and technical parts by an international adviser paid by the UNEP and UNDP.

A personnel training on the subject of technical and financial evaluation of the projects to be financed by the Multilateral Fund of the MP took part on the CP preparation.

Both the professional training and the workshop were supported by the UNDP, entity that has collaborated with US\$15.000, through the 'Proyecto a la Gestion Ambiental en Colombia'. The Colombian private sector has contributed for the preparation of the CP with US\$10.000.

- Publicity and Marketing Campaign

In the private sector, the ANDI informed its members about the MP and invited to participate in the CP formulation 160 companies affected by the dispositions of the Protocol. The implications of the MP and the work mechanisms decided were transmitted to the 41 associations or production groups, so that the message was acknowledged and diffused.

The Ministry of Development, restated the invitation to the private companies and associations or groups to work on the CP formulation, from a governmental position.

The ANDI prepared an informative document about the Montreal Protocol and its characteristics, its objectives regarding ODS phase out, the obligations of Colombia towards other nations and the challenges that the productive sector will have to assume to comply with the MP dispositions and the compromises acquired by the country. The document was distributed and explained to the journalistic media and some radio stations, who prepared and published articles that had large promotion.

A MP data base was established at ANDI with explicative material

about the Protocol, the Country Programme and different topics related to the MP. This material is available to the company owners and governmental entities in general. At ANDI any person interested is informed about general topics and specific questions are solved with the cooperation of the ODS-importing companies. Companies like 'ICI' and 'DuPont' have funded specialized seminars on substitute products and their corresponding technologies. Several magazines have published informative articles on the Ozone depleting problem and the Montreal Protocol.

- Industrial Measures to Promote Substitute Products and other Alternatives

* Refrigeration

Advances in this sector, thanks to enterprises like refrigerator manufacturers, maintenance companies or entities like SENA, have taken place in terms of tests with substitutes as HFC-134a, transition substances as HCFC-22 and other different mixtures, using old and new compressors to determine refrigeration efficiency, lubricant and machine operation. Tests are also running with other transition substances such as HCFC-141b and 142b, for insulating polyurethane foam production.

The objective of such tests is to minimize long term costs for refrigeration systems that will require maintenance but allow CFC-12 recycling or use mixtures. In other words, it is sought that installed equipment or equipment to be installed in short term with CFC-12 that has not fulfilled its life span completes it.

It is important to note that refrigerant recycling is one of the fields with most support for the compliance of Colombian objectives regarding the MP.

Producers of substitute substances such as 'ICI', through their representatives in Colombia have conducted and supported thesis projects for university students, related to the use of substitute products developed by the company. It has also distributed samples of refrigerants to many industrial consumers to allow them to run tests.

'Dupont', through its representative 'Cabarria', frequently organizes conferences for users about the operation of substitute gases and techniques on CFC-12 and 502 based equipment adjustment.

* Air conditioning

Presently in Colombia all air conditioning equipment, excepting those that are functioning at low pressure with CFC-11, all operate on HCFC 22, a transition substance. The technology to use these substances is originary from the trademarks of commercialized products in Colombia (section 2.2)

* Aerosols

In conformity with a legal disposition issued in 1989 (section 2.5), aerosol packaging companies were forced to eliminate the use of CFC's as propellents. In 1992 it was proclaimed that no aerosol produced in Colombia contained CFC's. Routine tests are presently done on aerosol contents regularly. This change meant the closure of several bottling plants and today only two firms fill in some 95% of aerosol products using hydrocarbons as propellent. Other bottlers are using dimethyl ether, a substance that has no effect on the ozone layer. CP actions will include be the establishment of supervision mechanisms to analyze the contents of imported aerosols to avoid the possibility of imported products containing CFC's as propellent. Companies as 'Cabarria', representative of 'DuPont' are organizing seminars on aerosol propellents, alternatives to pentane, used today in most aerosols produced in the country. The National University of Colombia also does research on efficiency and quality of other propellents.

* Foams

Importers of polyurethane and refrigerator manufacturers are undertaking research with mixtures and new products to obtain appropriate foaming, according to compromises stipulated by the CP. For polyurethane foams and thermal insulators for refrigerators, a program is being developed to allow the use of transition substances (HCFC-141b, HCFC-142b mixed with HCFC-22), foreseeing the elimination of these substances by an accepted technology change, (water, pentane or those designated by the MP).

* Solvents

Most of the consumers of Methyl Chloroform do not have replacement alternatives, nonetheless some of them are experimenting with Methyl Chloride and ultrasonic cleansing equipment for different articles. For cold cleaning of metallic pieces rags impregnated with gasoline are being used.

'Gillette de Colombia S.A.', one of the biggest consumers of Methyl Chloroform took the decision to eliminate this product from its cleaning process since September 1993 and to import from its principal office a finished alternative product called 'liquid paper'.

The price of Methyl Chloroform is increasing and it is expected to double, by the end of 1993, the price level of the first trimester of 1992. Therefore national users will have to replace it by other chlorides or by alternate cleansing systems.

* Fire Extinguishers

In Colombia products as Inergen and FM200 are being commercialized as substitutes for halon 1301 for fire extinguishing systems.

3. PROGRESSIVE PHASE OUT.

3.1. Governmental Strategy

Colombia is part of the countries listed in Article 5 of the Montreal Protocol, since its ODS consumption percapita per year is 0.3 kg (see table 2) being classified as developing country. However, The Colombian Government took the decision altogether with the most representative sectors, to phase out ODS as foreseen by the Montreal Protocol's chronogram approved during the IVth meeting of the contracting parties, requiring total support to the Country Programme by the Executive Committee of the Multilateral Fund.

Although Colombia is committed with the 1992 Copenhagen's schedule it is worth emphasizing two points. First, certain ODS elimination strategies will need additional time, as stated below. And second, possible delays in funds assignments or transfer might result in a consequent displacement of the country's phase-out chronogram.

The above statements mean that ODS imports will be suspended for the Protocol substances listed in Annexes A, B and C whenever possible without using the additional ten year term to start ODS fase-out.

Two ODS specific uses are excepted: CFC-11 and CFC-12 used as propellents for pharmaceutical aerosols used for respiratory therapies and on quarrantina treatments previous to the dispatch to other countries of agricultural products. Both cases are considered in the MP, the second one incorporated in the amendment of Copenhagen.

It should be noted that the refrigeration and air conditioning equipment that has an important fraction of its life span remaining, will be serviced and maintained through recycling of CFC-12 and CFC-11 or HCFC-22, when possible, avoiding the purchase of those ODS in the international market after the terms established in the chronogram. When recycling is not possible, those equipment will have to be adapted for correct operation with substitute substances permitted by the MP.

The Country Programme created to comply with this purpose, is based on an existing legal scheme that allows an inter-institutional coordinated and well-orientated work towards final phase out of each one of the ODS imported by the country.

The necessary actions to assure ODS phase out, presuppose a large participation of the private sector affected by the MP, in all the processes associated to the CP. For this reason a Technical Committee for the implementation of the Montreal Protocol, who will supervise the agreements stipulated in the CP. Projects will be supervised from their preparation until their final execution; a complete training and promotion program will be designed;

incentives and penalties will be prepared in case of nonfulfillment and in general all the elements needed for the CP execution in accomplishment of the MP will be controlled.

The CP strategic objectives are:

- Adoption of the CP as a legal regulation once the chronogram is approved and the financing decided by the Multilateral Fund.

- Technological adjustment to new technologies using substitute substances to phase out the ones listed on Annexes A and B of the MP.

- Implementation of intensive training programs for refrigeration maintenance personnel, certificating them as experts in this field.

- Implementation and realization of promotion programs addressed to the consumers in relation to the ozone problem and the mechanism adopted by the country in order to face it.

- Coordination of the private and public sectors' work through inter-sectorial agreements, to start the actions in order to accomplish the CP.

The most important restrictions for the fulfillment of the objectives are:

- The availability of the additional resources that allow the financing of first projects and in general the CP.

- The effective availability of substitute substances in the international market, on the required quantities by the country, at prices within the normal standards. It is important to mention that the entities that supply those substances, have the technical capacity to make these changes. Nonetheless, the current prices are high and the future demand it is not guaranteed.

- The international availability of the required equipment for technical transformation in the necessary quantities at competitive prices.

- The consumers receptiveness to the changes in processes and the maintenance guarantees offered by the producers, for products that will have ODS for some year as well as for those using substitute substances.

- The international availability of ODS elimination systems and MP mechanisms and agreements.

The President and Vice-president of the Technical Committee for the Montreal Protocol execution, will be in charge of the financial resource control.

The following criteria adopted by the Committee for the administration of the funds will be taken into consideration:

- Administrative Guarantees
- Disbursement agility
- Geographic availability of the resources
- Control on resources movement

At the actual stage of the CP it is important to establish two possible administration schemes for the funds: contracting with a fiduciary or giving the resources in administration to one of United Nations offices (UNDP).

With any of the formulas adopted, the destination of the funds should be decided by sector of interest and by priorities according to the CP.

If an inter-administrative agreement for resource management is established with one of the United Nations Offices, the Directive Council will include an international organism (UNDP), a representative from the National planning Department, a representative from the Ministry of Development and a representative of the private sector.

If another formula is applied, the private and public sector will have the same legal responsibility for resource management.

-Phase Out Chronogram for Each Substance Group

Colombia adopted the phase out Chronogram for ODS according to the decision of the parties at the IVth Copenhagen' meeting in November 1992. This decision represents the compromise of the country in relation to ozone layer preservation and with the environment. It is clear that a decision of that magnitude has a lot of implications for the affected industry and the consumers. So the fulfillment success of the CP depends on the support given by the Multilateral Fund, in order to start the program.

The following dates for the ODS phase out have been agreed by sectors, which volume of use will increase according to the MP chronogram requirements.

TABLE 3.1.
CHRONOGRAM OF ODS PHASE OUT

ACTIVITY	DUE DATE
1 - Importation and use of controlled substances in the MP Annex A and B for the refrigeration manufacture	January 1st, 1996
2 - Importation and use of controlled substances in the MP Annex C, for the manufacture of thermic isolation foam of polyurethane for refrigeration.	January 1st, 2030
3 - Importation and use of controlled substances of the MP Annex A and B for manufacture of air conditioning for vehicle use.	January 1st, 1996
4 - Maintenance of air conditioning of vehicles and load equipment, with use of controlled substances of the MP Annex A and B	January 1st, 1996
5 - Importation and use of controlled substances of the MP Annex C, for the manufacture of static air conditioning	January 1st, 2030
6 - Maintenance of refrigeration equipment: * Recycling of CFC from maintenance equipment * Use of azeotropic mixtures based on controlled substances of the MP Annex C	December 31st, 2010 December 31st, 2010

ACTIVITY	DUE DATE
7 - Maintenance of static air conditioning: * Importation and use of HCFC-22 * Recycling of HCFC 22 from maintenance equipment	January 1st 2030 December 31st 2040
8 - Importation of CFC 11 for new centrifugal air conditioning	January 1st, 1996
9 - Maintenance of centrifugal air conditioning * Importation of CFC-11 for recharge * Recharge with CFC -11 * Recycling of CFC 11 from maintenance equipment	January 1st, 1996 December 31st 2010 Until depletion of storage
10 - Importation of essential aerosols with controlled propellant (Annex A and B)	Until substitution is made by manufacturer.
11 - Importation and use of controlled substances MP Annex A & B for the polyurethane manufacture of polystyrene foams	January 1st , 1996
12 - Importation and use of Carbon tetrachloride	January 1st, 1996
13 - Importation and use of Methyl chloroform	January 1st, 1996
14 - Importation and use of halon 1211 and 1301 for mobile fire extinguisher or fixed systems	January 1st, 1994
15 - Importation and use of methyl bromide, except for quarantine and application to goods previous dispatch to other countries	The annual consumption of 1995 will not surpass that of 1991

3.2 Action Plan

3.2.1 Government Measures

The moment the CP is approved by the Executive Committee of the Multilateral Fund and the rest of instances that are pertinent to this document, the entities mentioned in it will initiate the operationalization and will adopt all legal and administrative provisions foreseen in the program in order to :

- Implement the phase out chronogram of ODS, for every application mentioned in the program, in correspondence with the provisions herein assigned in the Protocol. In the past this practice gave excellent results, achieving the elimination of the CFC use as a propellant in aerosols in Colombia, years before the elimination of was required by the MP to the developed countries.
- Establish of maximum ODS use levels for essential applications in which there is no temporary or definitive replacement for certain controlled substances, establishing in detail the measures and the persons in charge of them. This will include the explicit prohibition of importation of the mentioned substances in the MP Annexes A and B and the authorization for their recycling under determined situations.
- Establish of the minimum requirements that these substances of temporary or definitive substitution must meet and the general measures for recycling related with the increase in their consumption.
- Establish of the requirements related with ODS consumption data and amounts of substitute substances.
- Implement the verification mechanisms for nationally produced and imported goods that contain or require ODS use in their manufacturing process.
- Identify the activities in which ODS should be recovered and identification of the most appropriate processes in order to minimize the emission of ODS, with consequent sanctions whenever negligence is demonstrated.
- Identify the appropriate destruction procedures for certain ODS.
- Define the criteria to revise the measures based on decisions and adopted amendments by the parties in the protocol and ratified by the country.
- Define and adopt incentives for the CP accomplishment and provisions issued.
- Define and impose sanctions directly or through competent institutions, to juridic or private persons that violate established rules by the Committee and derived from the agreements established by the CP and those that emerge from provisions of section 3.3.

Government entities that are committed to the MP will also promote and execute

the following activities:

- Design and implementation of an information system about customers classified and registered by sectors and by ODS use and possible substitutes, base of the official reports from the country to the Ozone Secretariat, and source of the necessary information required for the follow up of the CP implementation. This data base will show the tendency of imports and use of substances described in the Protocol Annexes, as well as the exports of these substances or of products that contain them.
- Design and implementation of a specific program for the control of ODS, that serves as a technical support for the CP implementation.
- Implementation, in cooperation with the rest of the entities linked with the CP, of training programs and promotion campaigns destined to both technicians and personnel that uses ODS, such as consumers of these substances in themes such as:
 - + Legal administrative provisions for consumers.
 - + Sanctions and measures.
 - + Benefits and incentives.
 - + ODS substitutes.
 - + Financial sources.
 - + Security measures for manipulation of highly toxic substances.
- Study of tax and financial incentives such as:
 - + Tax exemption to production and commercialization of assets that do not contain ODS.
 - + Tax exemption for expenditures for the industrial recycling oriented to the substitution of the ODS use.
 - + Creation of credit lines to finance industrial recycling programs oriented to ODS use.

The Ministry of Foreign Trade, in accomplishment of its legal attribution and in conformity with provisions of the superior council of foreign trade will provide actions such as:

- Analysis of mechanisms to control ODS imports by:
 - + Possible fees for importation wrights for products with or without short term substitutes.
 - + A free importation regime but with previous licensing for importation.
 - + Implementation of fees or duties or their elimination depending on whether the use of the substance wants to be enhance or discouraged.
 - + Creation of a list of substances prohibited for importation, supported by the Decree 444 of 1967.
- Development of technical cooperation systems and identification of the difficulties or possible incentives in the international market to acquire or transfer appropriate technologies for ODS phase out or recycling.
- Review of the import estimate of substances listed in the MP.

- Study of a possible structure for the codification of the harmonized system of NANDINA.
- Analysis of the mechanisms to motivate imports of technology for the progressive substitution of ODS.

3.2.2. Projects

To accomplish the goals and objectives of the complete Colombian CP it is estimated that an amount of approximately US\$ 54,868,536 from the Multilateral Fund is necessary. Colombia would require during the first semester of 1994 an amount close to US\$ 18,233,536.00 to start ODS phase-out, once the projects are finalized and reviewed. All will be rigorously invested in the defined priority fields. The later figure corresponds with the projects already selected in accordance with the priorities defined in the CP.

The country is also interested in participating in monitoring of the changes in the ozone layer in the tropical stratosphere, in the study of the incidence of ultraviolet rays at different altitudes and the possible changes of the ultraviolet gamma rays usually retained by the ozone layer.

This last component for investigation costs US\$392,310.00, resources that the MP would dedicate as part of the world-wide investigation. Due to the fact that we deal with a project whose characteristics surpass the interests of the Colombian CP, we seek for multilateral participation in the execution of this investigation.

Generally, investments are programmed for each one of the fields that will be mentioned. The work priorities in such fields are based in the need to be prepared for the accomplishment of the phase out chronogram for the substances listed in Annexes A and B and in the net result of reducing ODS consumption.

In order to choose the fields of investment, the following criteria were applied:

- Sector share of the GNP of the industrial production of products affected by the MP.
- Relative importance of the sector in relation with the ODS consumption, in particular with regards to the substances listed in Annexes A and B .
- Critical enterprise necessity to comply with the MP regulations.
- Institutional capacity to administrate and support the execution of the CP and control MP fulfillment.

The priority fields agreed are the following:.

- Technical reconversion of domestic, commercial and industrial refrigerator manufacturers and refrigerator parts.
- Training and accreditation of maintenance personnel.

- Administrative requirements for the CP execution.
- Maintenance of refrigeration sectors.
- Technical reconversion of large industrial consumers of ODS, foam producers, and other refrigeration sectors.
- Technical and financial support for project preparation and design.
- CP and MP promotion to enterprises and consumers.
- Technical reconversion of the air conditioning sector still operating with CFC 11 and 12.

In order to classify the investment projects and proposals the following criteria were developed:

- Applies to a priority field of investment.
- Enterprise or institutional commitment to the CP and definitive agreements.
- State of the investment proposal or project readiness.
- Institutional capacity for the execution of the project.

During the formulation of the CP several enterprises initiated the elaboration of their projects. Some of them were advanced towards feasibility, while others achieved pre-feasibility levels or just identification of needs.

The Country Programme will be implemented progressively. The initial activities include the projects ready to be financed during the first semester of 1994, and those in charge of governmental agencies. New projects will be presented to the Executive Committee of the Multilateral Fund along 1994 and on, counting upon the funds required to aid ODS users to prepare them.

The incremental costs, for the projects nearly ready to be financed in the fields above identified are the following:

1. INSTITUTIONAL STRENGTHENING FOR THE CP EXECUTION INCLUDING MP ADMINISTRATION, PROJECTS PREPARATION AND DESIGN, AND CP DIVULGATION
US\$ 320.000.
2. INDUSTRIAL CONVERSION PROJECTS FOR ALL FOAM MANUFACTURERS USING CFC-12 (POLYSTYRENE FOAMS) AND CFC-11 (REFRIGERATOR INSULATING FOAMS) US\$ 4,667,758.40
3. INDUSTRIAL CONVERSION PROJECTS FOR REFRIGERATOR MANUFACTURERS

AND OTHER INDUSTRIAL AND COMMERCIAL REFRIGERATION FACILITIES
US\$ 10,510,969.7

4. INDUSTRIAL CONVERSION PROJECT OF THE MAIN COMPRESSOR
MANUFACTURER US\$ 2,734,808

Therefore, the additional costs to start colombian the ODS phase-out are US\$ 18,233,536.

Based on the global efficiency of the projects ready to be financed (US\$ 2.17 per kg of ODP), and on the ODP to be eliminated up to the year 2000 (16,800,000 kg), an estimate of the financial needs of Colombia to cover all the Incremental costs is US\$54,868,536.

Annex 1 includes the Institutional Strengthening Project that seeks financing from the Fund for a total of US\$320,000.00.

3.3 Entities that will execute a function in the application of the strategy.

As mentioned in section 2.3 it was decided to constitute two Technical committees to implement the CP and therefore the MP, involving the participation of the public and the private sectors.

This decision is supported by the fact that there is no unique entity that can be exclusively dedicated to the implementation of the CP, nor is it justified. The private sector is directly affected by the MP and in consequence it must have a permanent participation and representation in the organization. The CP has been formulated in an intense process of cooperation that is should be a long-lasting one. The continuity of the process around the MP and the CP is required in spite of government changes or personnel substitution.

Annex 3 shows a draft copy of the decree that establishes the structures of the committees. It lists the involved entities with their respective functions oriented to MP as well as those towards the committees.

3.4 Schedule and Consequences on the Consumption

The graphics included in Annex 4 show the total consumption predicted for ODS, the projected consumption in tons of ODS made by ODP and the established limits by the protocol with regards to the consumption.

3.5 Budget and Financing Program

-Cost generated by the reduction in the ODS import-tax collection

Table 6 shows the impact of import suspension of CFC and HCFC. It is important

to notice that ODS which come from Venezuela do not have any burden. The import tax from other countries is 5%.

Tables 6,7 and 8 give, when ODS listed in Annexes A and B of MP imports are totally suspended, an approximate tax collection loss of US\$ 183,705.00 for 1996.

-Aid Requested to the Fund

Colombia has calculated an approximate estimate of the funds required from the Multilateral Fund of US\$54,868,536.00 to cover the incremental costs in which the country must incur in order to phase-out its ODP up to the year 2000. To start CP technological implementation in accordance with the timetable agreed, the country needs during the first semester of 1994 an amount close to US\$ 18,233,536.00, that is 33.5% of the total requirements.

It is important to note that because of the Colombian decision to accomplish the chronogram agreed by the Parties during their IVth Copenhagen's meeting, most of the investments must occur before the end of the decade.

-Financial Aid from other Sources

The private enterprises for which we are forsaking a financing on this CP first phase have already been working to design the project and some of them are being implemented.

Project Col 91/025 of the National Planning Department and UNDP whose purpose is to support environmental action in Colombia, has continuously supported the elaboration stages of the CP, the editing costs and printout costs, through contracts with consultants, translators and aid personnel and by organizing workshops. This project will also support the workshops for technicians and project executors, for personnel involved with the CP contents and connotations and in general the actions required for an easier and progressive execution and review of the CP.

3.6. Agreement Supervision

The fulfillment of the compromises acquired by Colombia through the country program, will be supervised by the organization proposed in sections 3.1. and 3.3. The National Tax and Custom Directory of the Ministry of Treasury will supervise ODS imports, according to the INCOMEX strategy. (Appointed to the Ministry of Foreign Trade).

Using the database that the Ministry of Development will be structuring with INCOMEX and DIAN to control the imports and exports, and with the cooperation of the private sector, the effective ODS imports will be monitored and the information will be compared to the data provided by the main importing companies associated to ANDI.

ANDI will install a database that will be fed with the reports of the main ODS importing enterprises and with information from the principal companies on these substances.

The supervision for the ODS Phase out will be carried out by means of the Superintendence of Industry and Commerce (appointed to the Ministry of Development), based on the information given by the enterprises to this entity during inspections and product tests specified in decree 2746 of 1984, paid by the companies. The SIC will report to the foreseen committees. This entity, supported by the National University's Chemical Engineering Laboratory is running tests to determine CFC presence in aerosols from the Colombian market. This laboratory will be part of the substructure for the required verification for ODS use and phase out. The SIC will also ask for reports from maintenance companies about CFC recycling levels. This supervision is based on the agreements stipulated by entities that are engaged with this activities in the Country Programme.

The Ministry of Health, in use of its legal attributions, will also going to supervise the substances used in products, initially through the procedure of sanitary licensing and subsequently by virtue of technical verification so as to maintain informed the organization described in section 3.3.

By means of the agreement depicted in section 3.3 the necessary activities designed to destroy the recovered ODS (when recycling is not feasible). These projects will have to wait at least until the second phase of the CP.

Project execution with regards to physical and financial objectives will be supervised by the committees and will be inspected by the authorities. Each project will have a legal direct responsible and a director agreed with the authorities.

The project and program follow up will be executed by the same UN office selected as implementing agency, and at the same time this office will be the legal counter part assuring the fulfillment of the necessary actions to the public Colombian authorities and the private sector.

If the national MP implementation organization suggests the adoption of additional taxes to discourage ODS use , the completion of this authoritative pattern will be under the supervision of the Taxes and Customs Directory of the Ministry of Treasure, entity that has several mechanisms to supervise tax collection. If tariffs are implemented, the DIAN will be the entity responsible entity for the verification of such burden payment.

The implementation of incentives is based fundamentally on investment financing for the companies adapting to free-ODS technologies. The vigilance to this type of incentives is based on project follow-up activities. If it is agreed to introduce as incentive a tariffs reduction for substitute substances, this decision will be implemented by the DIAN by doing the corresponding procedures with the required organizations. All measures and actions that are progressively adopted will be developed by the organizations and public and private entities foreseen in detail in section 3.3 and supervised by the same organization.

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ANNEX 1 OF COUNTRY PROGRAMME
PROJECT COVER SHEET

COUNTRY OR REGION: COLOMBIA

SECTORS COVERED: INSTITUTIONAL ORGANIZATIONS

ODS CONSUMPTION IN AFFECTED SECTORS: N/A

PROJECT TITLE: INSTITUTIONAL STRENGTHENING FOR IMPLEMENTING THE
MONTREAL PROTOCOL IN COLOMBIA.

PROJECT DURATION: 3 YEARS.

PROJECT IMPACT: ODS PHASE-OUT : N/A
OTHER : INSTITUTIONAL PARTICIPATION IN THE
IMPLEMENTATION PROCESS

FUNDING REQUESTED: US\$ 317,790.00

IMPLEMENTING AGENCY: UNDP.

NATIONAL COORDINATING AGENCY: CNPO.

PROJECT SUMMARY

This project intends to assure the necessary resources for the local capacity building, project formulation and elaboration, AND information dissemination activities, required to implement the Montreal Protocol in Colombia and to execute the Country Programme.

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I) PROJECT TITLE.

INSTITUTIONAL STRENGTHENING FOR IMPLEMENTING THE MONTREAL PROTOCOL IN COLOMBIA

II) PROJECT DESCRIPTION

This project has the following objectives.

- To support and enhance the process of capacity building and technical assistance to the public or private entities involved in the implementation of the Montreal Protocol.
- To assure continuity in the elaboration and implementation of the Colombian Country Program.
- To help with the formulation of new industrial conversion projects related to the Montreal Protocol.
- To disseminate the information related to the world situation and the state of the ozone layer at a national and international level, towards the public and private sectors.
- To assist the representatives of Colombia at national or international events about ODS and the ozone layer.
- To assist in the organization and preparation of events at the national level to assure the compliance with the Montreal Protocol.

The National Council for the Preservation of The Ozone Layer will be held responsible for this project and will be in charge of the follow-up. From the public sector:

+ The Ministry of Economic Development, the Ministry of the Environment, the Ministry of Foreign Commerce, the Ministry of Foreign Affairs, the Himat, the Superintendency of Commerce and Industry, the Dian, the Ministry of Agriculture, the Ministry of Finance, The Ministry of Health, the National Planing Department, the ICA, the Incomex, the SENA, the National University of Colombia and the INEA.

From the private sector:

+ The ANDI, the ACOPI, the ACAIRE, the ASOPLASTICOS, The Asociación Colombiana de Exportadores de Flores, the Fedemetal, the Colombian security Counvil, the ICONTEC.

The requirements of the implementation of the Montreal Protocol in Colombia are complex and they need an integral environmental managerial policy. This requires a combined effort from the public and private sector, implicating technological, legal and administrative conversion processes. The entity in charge of preparing and elaborating the conversion projects and of coordinating the implementation of the MP will have to be assisted and funded. The funding solicited will allow the operation of the

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technical group.

In order to assist the National Council for the protection of the Ozone Layer the cooperation of several consultants will be required, with their appropriate equipment to progressively incorporate the knowledge and know how on non-depleting technologies.

The technical group will also require assistance in the formulation and elaboration of other phases of the Country Program.

To inform the general public about the negative effects of ODS on the ozone layer, a daily effort of dissemination is required towards industry owners, and all citizens in general. This will not only create a certain conscience about the ozone problem, but will progressively change the attitude of consumers and producers, to handle ODS properly avoiding over use and excessive waste. The National Council for the Protection of the Ozone Layer is being formalized, in a special decree prepared by the inter-institutional group.

III) PROJECT TIMEFRAME

The National Council for the Protection of the Ozone Layer will start operating in the first semester of 1994. However, the inter-institutional group that worked during the elaboration of the country program is still able of achieving any requirement. This project will be assuring the funds required for 1994.

IV) OUTPUTS

This project will assure the required funds to cover the operational costs of a technical unit that will evaluate and elaborate industrial conversion projects. These funds will help implement the Country Program and formulate further phases of the program. The activities include studies, investigations, document production, coordination actions, reunions, trips, negotiation with the Executive Committee and other activities related to the Montreal Protocol.

The public and private sectors have done important efforts to collect the information and data necessary to design a Country Programme but other efforts will be critical to implement the action plan.

UNEP has also cooperated by sending international consultants to Colombia and the Unit will keep working in close cooperation with this entity. However, UNDP will be the implementing agency for the Protocol.

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V) BUDGET

The following table shows the cost distribution for this project. The estimates include three years of operation:

ITEM (Total for three years)	US\$
PERSONNEL	
- Coordinator	70.000
- Professional Coordinator Assistants (two)	50.400
- Supporting staff (two)	12.000
TOTAL HONORARIES	132.400
EQUIPMENT	
- Computer System	7.400
- Typewriter	600
- Fax Machine	1.000
- Photocopier	2.500
SUBTOTAL EQUIPMENT	11.500
TOTAL OPERATIONAL COSTS:	145.000
Contingency Costs (10%)	29.890
TOTAL COSTS	317.790

--Personnel

The technical staff in charge of coordinating the technical unit in charge of the implementation of the Montreal Protocol will be composed by a National Coordinator, a Coordination Assistant, a bilingual secretary, three Professional staff, three Support staff.

International consultants will train national technicians who will also assist the public and private institutions related with the Country Program and the Montreal Protocol. The consultants will assist in the elaboration of new industrial conversion projects. They will also assist public and private national entities related to the Montreal Protocol and enhance the capacity building process to assure the continuity of the implementation of the Montreal Protocol. The funds required for these consultants will be obtained through the US\$ 100,000 included in the Assistance proposal with UNDP.

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-Equipment

The equipment mentioned in the cost list includes the minimum work tools for the technical units such as personal computers. In the case of temporary work contracts, the equipment will be temporarily assigned to the corresponding consultant. Every machine will count with its own software licenses for communications, worksheets, word processing, etc.

-Operational Costs

These include all office accessories and services (telephone, fax, telex), to assure the proper operation of the unit, and to enable its communication with other national and international entities. The connexion to international network systems could be necessary, specially with OzonAction. Travel Expenses and air fares are also included, as unit staff will have to assist to several international and national events. Colombia, given its economic condition, can't assure the assistance of the personnel to the totality of the events and this would have a negative effect on the implementation of the Country Program.

ANNEX 2

Official Translation of a document written in Spanish, which for identification purposes carries the stamp of MARTHA LUCIA ARCINIEGAS M., Official Translator/ Interpreter as per Res. 1523 of Min-Justice

TRANSLATION OF A DECREE EMANATED BY THE MINISTRY OF ECONOMICAL DEVELOPMENT

DECREE No.

By which the National Commission for the Preservation of the Ozone Layer is created, the Industrial Technical Sub-commission for the Montreal Protocol implementation and by which other dispositions are issued.

THE PRESIDENT OF THE REPUBLIC OF COLOMBIA

in practice of the delegation of the power conferred by the
constitutional and legal faculties
and specially by those foreseen by Decree 1050 of 1968

WHEREAS

That by means of Law 30 of 1990 Colombia ratified the Convention of Vienna for the Ozone Layer preservation, signed on the 22nd of March, 1985 in Vienna.

That by means of Law 29 of 1992 the Adhesion of Colombia to the Montreal Protocol was approved regarding the Ozone depleting substances and by its amendments of London (1990) acquired the

compromise of controlling, reducing and eliminating the ozone depleting substances, hereinafter called ODS.

That for the fulfillment of the compromises acquired by Colombia by virtue of the Convention of Vienna and the Montreal Protocol it is necessary to constitute the National Commission for the Preservation of the Ozone Layer that coordinates the actions that Colombia must undertake whether nationally or internationally to protect the ozone layer.

That for the fulfillment of the acquired compromises by the industrial, commercial and domestic ODS users by virtue of the Montreal Protocol, it is necessary to create an Industrial Technical Sub-Commission for the Montreal Protocol implementation that coordinates the accomplishment of those obligations in agreement between the public and private sectors.

BE IT RESOLVED

Article 1st.- To create the National Commission for the Ozone Layer preservation that works as a Consultant staff of the National Government, appointed to the Ministry of Agriculture or the entity that will be in charge of environmental matters (Ministry of The Environment).

Article 2nd. -The National Commission for the Ozone Layer preservation will be integrated in the following

way:

By the Governmental Sector:

1. The Ministry of Agriculture or who in the future acts as a legal representative of the entity in charge of the of the environmental matters.
2. The Ministry of Economical Development or his representative, who will act as Vice-president.
3. The Ministry of Foreign Affairs or his representative
4. The Ministry of Treasury and Public Credit or his representative.
5. The Ministry of Foreign Commerce or his representative
6. The Ministry of Health or his representative
7. The Director of the National Planning Department or his representative.
8. The Head of the National Institute of Natural Renewable Resources and Environment -INDERENA - or who in the future complies the functions as Secretary of the National

Commission for the Ozone Layer preservation.

By the managerial sector: Four representatives of the union.

Article 3rd. -The Ministers only could delegated on the Vice-Ministers and the Director of the National Planning Department on the Sub-Director.

Article 4th. -The National Commission for the Preservation of the Ozone Layer will be in charge of:

a. To act as consultant Body and consultant of the National Government, in order to fulfill the acquired compromises by virtue of the Vienna Convention, the Montreal Protocol and all the agreements that in the future Colombia approves and which purpose will be the Ozone Layer preservation.

b. Present under the Government consideration the reports that must be submitted to the Executive Committee Secretary ' Multilateral Fund of the Montreal Protocol.

c. Recommend programs and participation mechanisms of the public and private entities in order to comply with the Vienna Convention of the Montreal

Protocol, the Country Program and other mechanisms, which objective will be the Preservation of the Ozone Layer.

d. Present to the National Government, recommendations about the decisions that must be taken for the fulfillment of the Convention of Vienna, the Montreal Protocol and also the position that the Government will adopt in the Montreal Protocol meetings.

e. Formulate the corresponding request to the appropriate entities according to the nature of the National Government recommendations and decisions.

f. Recommend that administrative and juridical regulations be adopted in order to comply with the Montreal Protocol.

g. Promote and support promotion and training programs related to the Ozone Layer, the ODS, the technological changes and the means for achieve it, so that the Montreal Protocol and the Country Program are fulfilled.

h. Suggest to the National Government the creation

of technical subcommissions in charge of specific subjects related to the Ozone Layer preservation and the Montreal Protocol implementation.

i. Recommend to the Ministry of Foreign Affairs the creation of official delegations so international settlements regarding the Ozone Layer preservation could set up.

Article 5th. -Create a Technical Industrial Subcommission for the implementation of the Montreal Protocol appointed to the Ministry of Economical Development.

Article 6th. -The Technical Industrial Sub-commission for the Montreal Protocol implementation will be constituted by:

- The Vice-Ministry of the Economical Development or the Director of the Technical Industry who will act as his deputy, will coordinate it.

- The Head of the National Institute of Natural and Renewable Resources of the Environment - INDERENA - or the Environment Sub-Manager, who will act as his deputy, or a representative of the entity that in the future will be in charge (Ministry of the Environment).

- The Head of the Special Division of Environment Policy and Autonomous Corporations of the National Planning Department.
- The Sub-Director of Environment Risk Control Factors of the Ministry of Health.
- The Sub-Director of the Integration & Multilateral Organizations of the Ministry of Foreign Affairs.
- A representative of ACOPI
- A representative of ASOCOLFLORES
- A representative of the Colombian Security Counsel
- The Chief of the Division of Fiscal Studies of the Tax and Custom Administration - DIAN-
- The Chief of the Division of Technical Standards of the Superintendence of Industry and Commerce.
- An adviser of the Importation Committee of INCOMEX
- The Sub-Director of Hydrology and Meteorology -HIMAT-
- A representative from SENA
- A representative from the National University of Colombia
- The Sub-Manager for the Preservation of Agricultural Production of the Colombian Agricultural Institute. -ICA-
- A representative of the ANDI
- A representative of the FEDEMETAL
- A representative of ACAIRE
- A representative of ACOPLASTICOS
- A representative of ICONTEC

Article 7th. -The roles that the Industrial Technical Subcommission must fulfill are:

- a. To prepare and present to the National Commission for the Preservation of the Ozone Layer the appropriate documents required by the Montreal Protocol (MP).
- b. To present to the Executive Committee of the Montreal Protocol Multilateral Fund of the Country Program (CP) the industrial and commercial transformation projects subject to technical evaluation.
- c. To be part of the Colombian delegation in order to put forward the transactions of industrial transformation projects with the Multilateral Fund and other funding sources.
- d. To implement the mechanisms that allow the private and public entities to have access to the international technical co-operation or other bilateral o multilateral sources in an effective and opportune way so the acquired obligations of the Montreal Protocol (CP) and the

Country Program by the industrial, commercial and domestic ODS users be accomplishment

- e. To promote the formulation of industrial, commercial and consumption transformation projects and to evaluate their follow up through a Technical Unit.
- f. To guide the allowance of public and private resources for the cooperation to the above mentioned projects.
- g. To propose, if possible, the mechanisms that allow the supervision of those resources' final use.
- h. Try that the investment and industrial, commercial and consumption priorities be executed and be determined by the Country Program.
- i. To request the information that allows the technical fulfillment of the financed projects.
- j. To be up to date in the Country Program regarding the commitments of the ODS industrial, commercial and domestic users.

- k. To supervise the strictly fulfillment of the ODS industrial, commercial and domestic user's commitments set up in the Montreal Protocol and in the Country Program.
- l. To coordinate the programs and participation mechanisms for the public and private institutions for the different user above mentioned, in order to comply with the Montreal Protocol requirements.

Article 8th. -The Industrial Technical Sub-commission of the Montreal Protocol (MP) will organize a Technical Unit to support the different project evaluation tasks as well as the follow up on the Country Program. This Technical Unit would work under the supervision of the Head of the Special Division of Environmental Policy of the National Planning Department, which will work with its own resources from the Multilateral Fund of the Montreal Protocol or any other source of cooperation and will be integrated by industrial, environmental and scientific technicians.

Article 9th. -The Industrial Technical Sub-Commission for the Montreal Protocol implementation, could, when necessary, establish work groups for specific

subjects.

Article 10th. -The National Commission for the Preservation of the Ozone Layer as well as the Industrial Technical Sub-Commission for the Montreal Protocol Implementation, will issue their regulations within 60 days.

Article 11th. -The Decree hereby enters in force from the date of its issue.

This is a true and faithful translation of a document written in Spanish, copy of which is kept on file for future reference.

MARTHA LUCIA ARCINIEGAS M.
Official Translator/interpreter
Res. 1523 Min-Justice

TABLE 1 - ODS CONSUMPTION STRUCTURE IN %

14/1/94

SUBSTANCE	SECTOR	APPLICATION	CONSUMPTION 1986			CONSUMPTION 1992			CONSUMPTION 2000			CONSUMPTION 2015		
			TON PAO	% (1)	% (2)	TON PAO	% (1)	% (2)	TON PAO	% (1)	% (2)	TON PAO	% (1)	% (2)
CFC-11	ANEX A, GROUP I SUBSTANCES													
	Domestic refrigeration	Polyurel isolating foaming	70	25.18	5.81	100	30.30	4.50	279	47.29	6.41	487	44.60	5.80
	Commercial refrigeration	Polyurel isolating foaming	10	3.60	0.83	25	7.58	1.12	38	6.44	0.87	72	6.59	0.86
	Industrial refrigeration	Polyurel isolating foaming	24	8.63	1.89	165	50.00	7.42	226	38.31	5.19	460	42.12	5.48
	Subtotal refrigeration		104	37.41	8.84	290	87.88	13.05	543	92.03	12.47	1019	93.32	12.15
	Air conditioning	Charge of centrifuge compressor systems and large water chillers	1	0.36	0.08	1	0.30	0.04	1	0.17	0.02	1	0.09	0.01
	Mainten. of refri. syst.	Dehydration of refri. syst. and isolation foam repairing	8	2.88	0.66	5	1.52	0.22	13	2.20	0.30	16	1.47	0.19
	Maintenance of air cond.	Centrifuge systems recharge	9	3.24	0.76	9	2.73	0.40	9	1.53	0.21	9	0.82	0.11
	Subtotal maintenance		17	6.12	1.41	14	4.24	0.63	22	3.73	0.51	25	2.29	0.30
	Aerosols	Container filler	150	53.96	12.48									
CFC-12	Polyurethane foams	Flexible moulded foam	2	0.72	0.17	8	2.42	0.36	20	3.39	0.46	39	3.57	0.46
		Integral skin	4	1.44	0.33	14	4.24	0.63						
		Footwear	6	2.16	0.50	25	7.58	1.12	24	4.07	0.55	47	4.30	0.56
	Subtotal polyurethane foams		278	100.00	23.09	330	100.00	14.84	590	100.00	13.55	1082	100.00	13.02
	TOTAL CFC-11		111	12.22	9.22	105	7.64	4.72	300	11.25	6.89	490	9.67	6.84
	Domestic refrigeration	Refrigeration system charge	28	3.08	2.33	36	2.62	1.62	53	1.99	1.22	77	1.52	0.92
	Commercial refrigeration	Refrigeration system charge	32	3.52	2.68	75	6.46	3.37	103	3.86	2.37	196	3.91	2.36
	Industrial refrigeration	Refrigeration system charge	171	18.83	14.20	218	16.72	9.72	466	17.10	10.47	765	15.09	9.12
	Subtotal refrigeration		14	1.54	1.16	21	1.53	0.94	31	1.16	0.71	50	0.99	0.60
	Air conditioning	Automobile air conditioners	315	34.69	26.16	608	58.81	36.35	1094	39.90	24.44	2105	41.54	25.09
ANEX A, GROUP II SUBSTANCES	Mainten. of refri. syst.	Refrigerat. syst. recharge	77	8.48	6.40	119	8.66	5.35	175	6.56	4.02	293	5.78	3.49
	Maintenance of air cond.	Automobile air cond. recharge	382	43.17	32.56	927	67.47	41.70	1239	46.46	28.46	2398	47.32	28.58
	Subtotal maintenance		220	24.23	18.27									
	Aerosols	Container filler	111	12.22	9.22	210	15.28	9.45	941	35.28	21.61	1856	36.60	22.11
	Polyethylene foams	Moulded foam blowing	908	100.00	75.42	1374	100.00	61.81	2667	100.00	61.25	5058	100.00	60.41
	TOTAL CFC-12		1186		88.50	1704		78.65	3267		74.80	6160		73.42
	TOTAL ODS ANEX A, GROUP I													
	TOTAL ODS ANEX A, GROUP II													
	HALON 1211	Portable fire extinguisher	60	100.00	2.70	24	100.00	0.55	24	100.00	0.55	24	100.00	0.29
	HALON 1301	Fixed fire exting. syst.	150	100.00	6.75	320	100.00	7.35	550	100.00	7.90	574	100.00	6.56
ANEX B, GROUP II SUBSTANCES	Solvents	Chemical labs., Universities, some industrial processes												
	TOTAL ODS ANEX B, GROUP II													
	TOTAL ODS ANEX B, GROUP III													
	1,1,1-Trichloroeth	Metal cleaning and final product preparation	20	100.00	0.90	20	100.00	0.90						
ANEX B, GROUP III SUBSTANCES														
	TOTAL ODS ANEX B, GROUP III													

TABLE 1 - ODS CONSUMPTION STRUCTURE IN %

SUBSTANCE	SECTOR	APPLICATION	CONSUMPTION 1988			CONSUMPTION 1992			CONSUMPTION 2000			CONSUMPTION 2015		
			TON PAO	% (1)	% (2)	TON PAO	% (1)	% (2)	TON PAO	% (1)	% (2)	TON PAO	% (1)	% (2)
ANEX C, GROUP I SUBSTANCES														
HCFC-22	Industrial refrigeration	Refrigeration system charge	1	11.11	0.08	1	5.88	0.04	2	7.41	0.05	3	6.52	0.04
	Air conditioning	Fixed air conditioners	2	22.22	0.17	4	23.53	0.18	6	22.22	0.14	11	23.91	0.13
	Mainten. of refig. syst.	Recharge of some commer. syst.	2	22.22	0.17	3	17.65	0.13	4	14.81	0.09	6	13.04	0.07
	Maintenance of air cond.	Fixed air condit. recharge	4	44.44	0.33	9	52.94	0.40	15	55.56	0.34	26	56.52	0.31
	Subtotal maintenance		6	66.67	0.50	12	70.59	0.54	19	70.37	0.44	32	69.57	0.38
	TOTAL ODS ANEX C, GROUP I		9	100.00	0.75	17	100.00	0.76	27	100.00	0.62	46	100.00	0.55
ANEX E SUBSTANCES														
Methyl bromide	Pesticides	Insecticide, fungicide, storage, quarantine.				259	100.00	11.65	704	100.00	16.17	1568	100.00	18.69
	TOTAL ODS ANEX E					259		11.65	704		16.17	1568		18.69
AZEOTROPIC MIXTURE														
CFC-502	Commercial refrigeration	Refrigeration system charge	3	33.33	0.25	5	38.46	0.22	8	36.36	0.18	14	33.33	0.17
	Industrial refrigeration	Refrigeration system charge	1	11.11	0.08	4	30.77	0.18	6	27.27	0.14	13	30.95	0.16
	Subtotal refrigeration		4	44.44	0.33	9	69.23	0.40	14	63.64	0.32	27	64.29	0.32
	Mainten. of refig. syst.	Refrigeration system recharge	5	55.56	0.42	4	30.77	0.18	8	36.36	0.18	15	35.71	0.18
TOTAL AZEOTROPIC MIXTURE			9	100.00	0.75	13	100.00	0.58	22	100.00	0.51	42	100.00	0.50
TOTAL ODS			1204		100.00	2223		100.00	4354		100.00	8390		100.00

% (1): Percentage of ODS with relation your total

% (2): Percentage of ODS with relation your total ODSs

1/ As no figures are available for all years it is impossible to calculate forecasts

TABLE 3

ODS COUNTRY CONSUMPTION 1991 AND 1992

14/1/94

SUBSTANCE	IMPORT & CONSUMPT. (ton)		OZONE DEPLET. POTENTIAL	CONSUMPTION (ton ODP)	
	1991	1992		1991	1992
CFC 11	318	330	1.0	318	330
CFC 12	1279	1374	1.0	1279	1374
CFC 502 1/	51	44	0.321	16	14
HCFC 22	290	302	0.055	16	17
SUBTOTAL				1629	1735
HALON 1211	43	20	3.0	129	60
HALON 1301	24	15	10.0	240	150
SUBTOTAL				369	210
1,1,1-TRICLOROETHAN	200	200	0.1	20	20
METHYL BROMIDE 2/	218	371	0.7	153	260
TOTAL				2171	280

1/ Azeotropic mixture with 48.8% of R-115 and 51.2% of R-22

2/ Figure in tones obtained multiplying original value in liters times its specific weight, 1.732 times its ODP.

TABLE 6

COSTO FISCAL SUSPENSIÓN DE IMPORTACIONES DE CFC Y HCFC

Gravamen del 5%

ANO	PESO TON.	PESO SIN VEN. TON.	VALOR CIF SIN VEN. US\$ 1894.46/TON.	COSTO FISCAL US\$ (1)	VALOR CIF SIN VEN. US\$ 1951.85/TON.	COSTO FISCAL US\$ (2)
1986	1394	948	1,795,272	89,764	1,849,650	92,483
1987	1248	848	1,607,245	80,362	1,655,928	82,796
1988	1352	919	1,741,182	87,059	1,793,922	89,696
1989	1821	1,238	2,345,187	117,259	2,416,222	120,811
1990	2255	1,533	2,904,117	145,206	2,992,081	149,604
1991	1971	1,340	2,538,366	126,918	2,615,252	130,763
1992	2081	1,415	2,680,030	134,002	2,761,207	138,060
1993	2315	1,574	2,981,389	149,069	3,071,693	153,585
1994	2514	1,709	3,237,672	161,884	3,335,740	166,787
1995	2611	1,775	3,362,594	168,130	3,464,445	173,222
1996	2769	1,882	3,586,076	178,304	3,674,090	183,705
1997	2779	1,809	3,578,954	178,948	3,687,359	184,368
1998	2972	2,020	3,827,510	191,376	3,943,444	197,172
1999	3134	2,130	4,036,143	201,807	4,158,396	207,920
2000	3227	2,194	4,155,914	207,796	4,281,795	214,090
2005	4197	2,853	5,405,135	270,257	5,568,854	278,443
2010	5029	3,419	6,476,632	323,832	6,672,806	333,640
2010	5856	3,981	7,541,689	377,084	7,770,124	388,506

CIFRAS Y PROYECCIONES DE LA ANDI

(1) Costo fiscal tomando precios implícitos promedio de 1991 y 1992 US\$ 1894.46 por tonelada

(2) Costo fiscal tomando precios implícitos de 1992 US\$ 1951.85 por tonelada

* Las importaciones de Venezuela durante los dos últimos años en promedio representaron el 32.02 de las importaciones totales de CFC y HCFC

TABLE 7

COSTO FISCAL SUSPENSION DE IMPORTACIONES DE 1,1,1 TRICLOROETANO

Gravamen del 5%

ANO	PESO TON.	VALOR CIF US\$ 622.33 POR TON.	COSTO FISCAL US\$ (1)	VALOR CIF US\$ 673.78 POR TON.	COSTO FISCAL US\$ (2)
1988	315	212,240	10,612	196,033	9,802
1989	300	202,133	10,107	186,698	9,335
1990	257	173,161	8,658	159,938	7,997
1991	200	134,755	6,738	124,465	6,223
1992	200	134,755	6,738	124,465	6,223
1993	180	121,280	6,064	112,019	5,601
1994	150	101,066	5,053	93,349	4,667
1995	100	67,378	3,369	62,233	3,112
1996	80	53,902	2,695	49,786	2,489
1997	50	33,689	1,684	31,116	1,556
1998	20	13,476	674	12,447	622
1999	0	0	0	0	0
2000	0	0	0	0	0
2005	0	0	0	0	0
2010	0	0	0	0	0
2010	0	0	0	0	0

CIFRAS Y PROYECCIONES DE LA ANDI

(1) Costo fiscal tomando precios implícitos promedio de 1991 y 1992 US\$ 622.33 por tonelada

(2) Costo fiscal tomando precios implícitos de 1992 US\$ 673.78 por tonelada

TABLE 8 :

COSTO FISCAL SUSPENSION DE IMPORTACIONES DE BROMURO DE METILO Gravamen del 5% ↓					
ANO	PESO TON.	VALOR CIF US\$ 16,909.72 POR TON.	COSTO FISCAL US\$ (1)	VALOR CIF US\$ 31,030.33 POR TON.	COSTO FISCAL US\$ (2)
1990	119	2,012,256	100,613	3,692,609	184,630
1991	126	2,130,624	106,531	3,909,822	195,491
1992	214	3,618,679	180,934	6,640,491	332,025
1993	248	4,193,610	209,680	7,695,522	384,776
1994	296	5,005,276	250,264	9,184,978	459,249
1995	343	5,800,033	290,002	10,643,403	532,170
1996	391	6,611,699	330,585	12,132,858	606,643
1997	438	7,406,456	370,323	13,591,285	679,564
1998	486	8,218,122	410,906	15,080,741	754,037
1999	533	9,012,879	450,644	16,539,166	826,958
2000	581	9,824,546	491,227	18,028,622	901,431
2005	818	13,832,148	691,607	25,382,811	1,269,141
2010	1,056	17,856,661	892,833	32,768,029	1,638,401
2010	1,293	21,864,264	1,093,213	40,122,218	2,006,111

CIFRAS Y PROYECCIONES DE LA ANDI

(1) Costo fiscal tomando precios implícitos promedio de 1991 y 1992 US\$ 16,909.72 por tonelada

(2) Costo fiscal tomando precios implícitos de 1992 US\$ 31,030.33 por tonelada

TABLE 9

IMPORTACIONES DE SUSTANCIAS QUE AGOTAN LA CAPA DE OZONO
VENEZUELA Y RESTO DEL MUNDO
1991 - 1992

DESCRIPCION	PARTIDA			
	2903401000 CLOROFLUOROMETANOS	3823809990 • MEZCLAS	1991	1992
TOTAL IMPORTACIONES	VALOR CIF US\$ PESO NETO KGS.		2,773,615 1,571,247	3,824,689 2,074,993
VENEZUELA (Imp. exentas)	VALOR CIF US\$ PESO NETO KGS.		840,496 518,970	1,030,357 643,358
RESTO DEL MUNDO (Imp. Gravadas)	VALOR CIF US\$ PESO NETO KGS.		1,933,119 1,052,277	2,794,332 1,431,635
PART. DE VENEZUELA EN TOTAL %	VALOR CIF US\$ PESO NETO KGS.		30.30 33.03	26.94 31.01
PART. PROMEDIO VENEZUELA (91 + 92)/2	VALOR CIF US\$ PESO NETO KGS.		28.62 32.02	1.66 0.70
			1.47 1.09	1.27 1.48
			10,727,297 15,326,773	18,212,269 9,902,818
			178,090 107,516	231,792 146,949
			10,549,207 15,219,257	17,980,477 9,755,869

• PARTIDA POR LA CUAL ENTRAN IGUALMENTE PRODUCTOS QUE NO AFECTAN LA CAPA DE OZONO

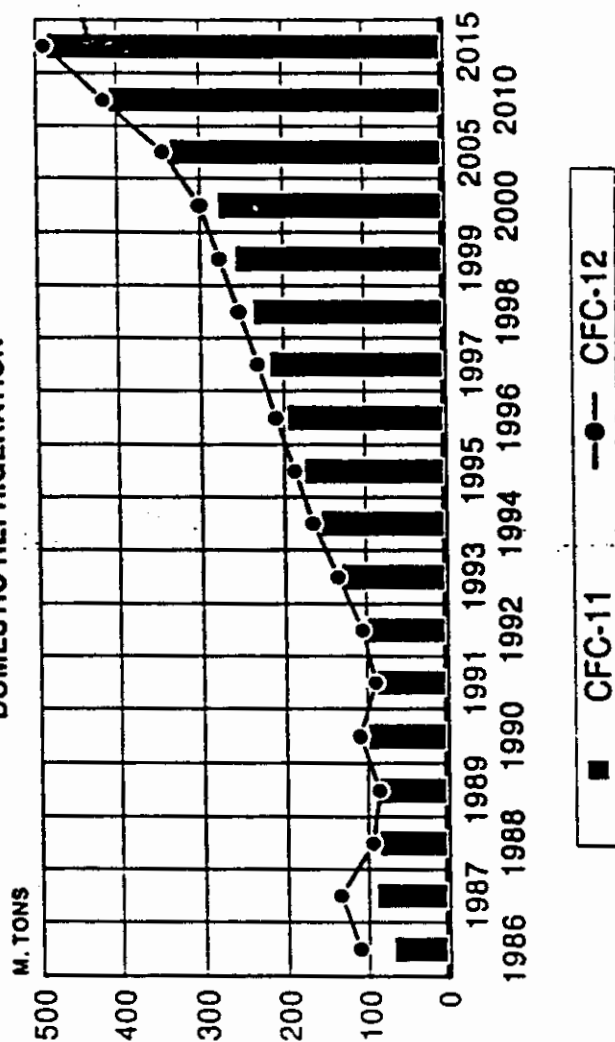
FUENTE: 1991: DANE; 1992: DIAN.

CIFRAS PRELIMINARES
ELABORADO POR CENTRO DE ESTUDIOS FISCALES
DIRECCION DE IMPUESTOS Y ADUANAS NACIONALES

Graf. Nº 1

ODS

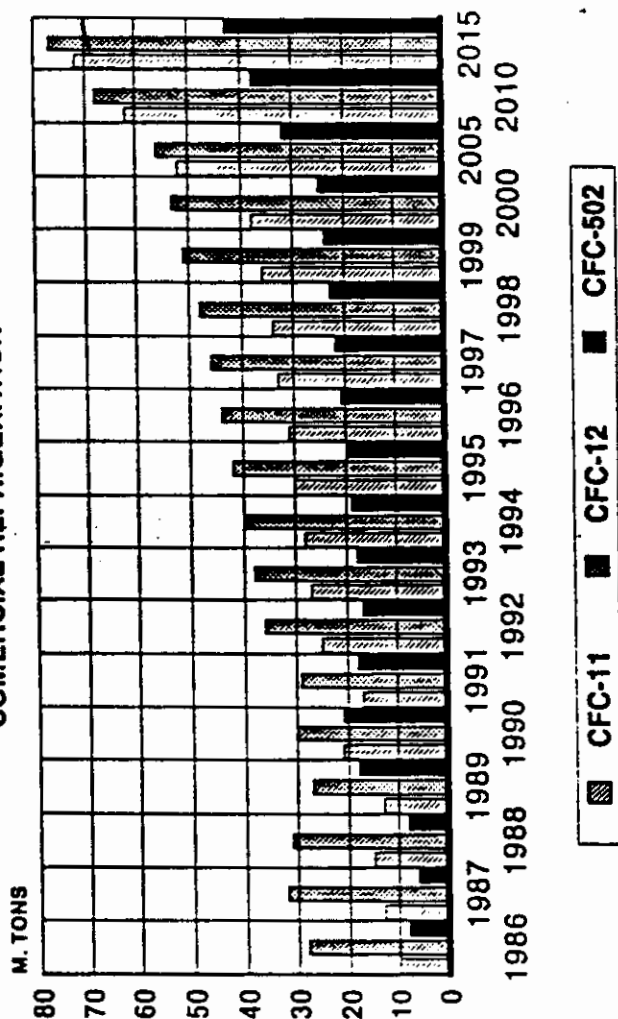
CONSUMPTION FORECAST
DOMESTIC REFRIGERATION



Graf. Nº 2

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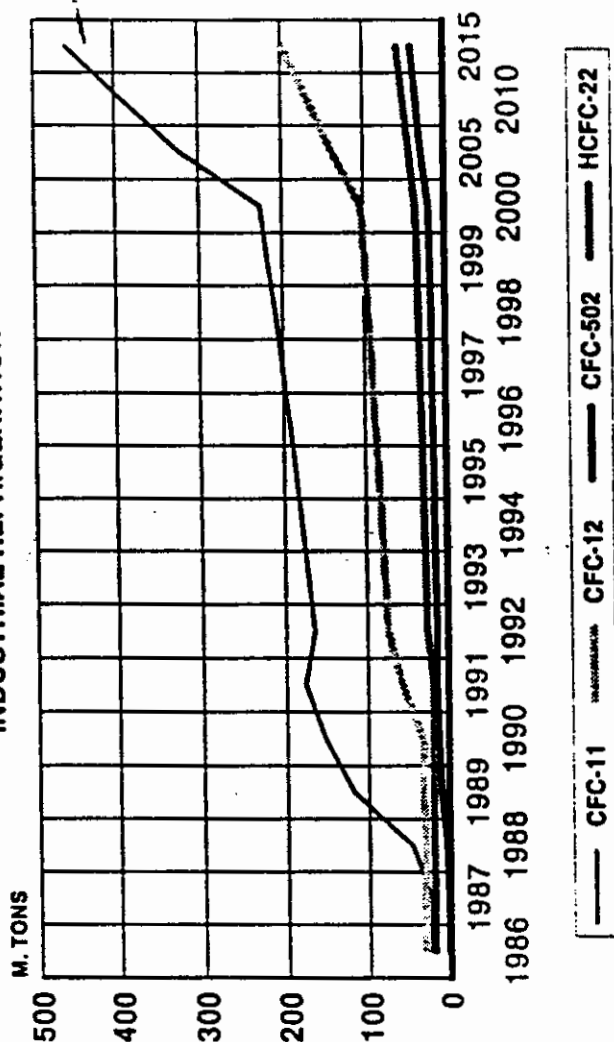
CONSUMPTION FORECAST COMERCIAL REFRIGERATION



Graf. Nº 3

ODS

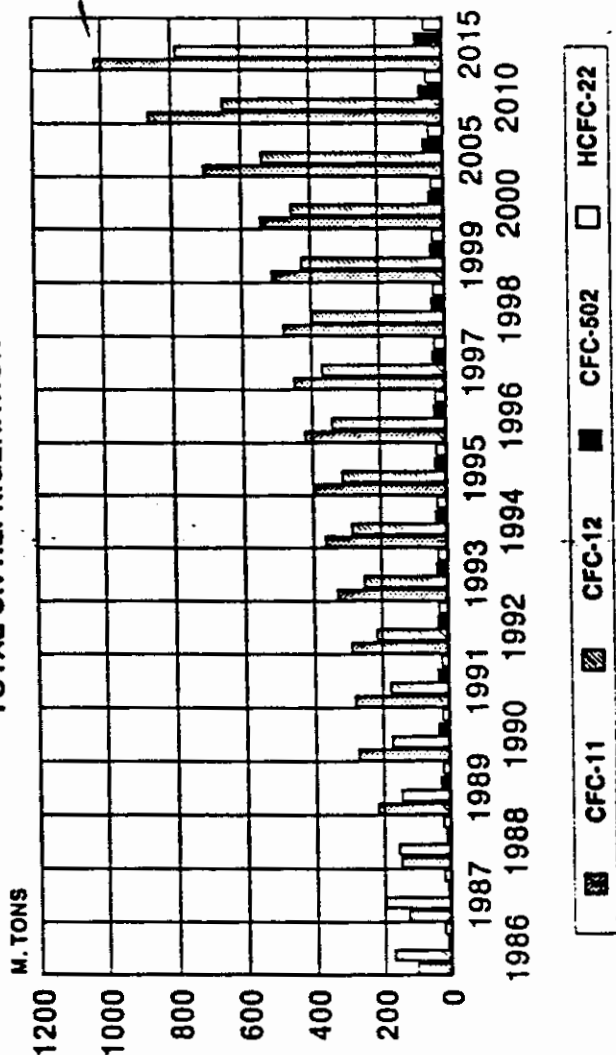
CONSUMPTION FORECAST INDUSTRIAL REFRIGERATION



Graf. Nº 4

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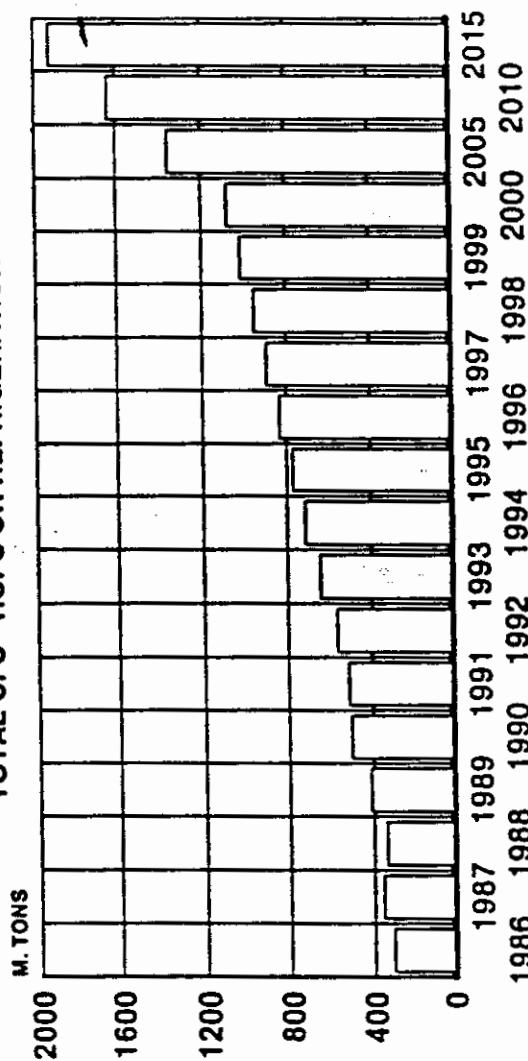
CONSUMPTION FORECAST
TOTAL ON REFRIGERATION



Graf. Nº 5

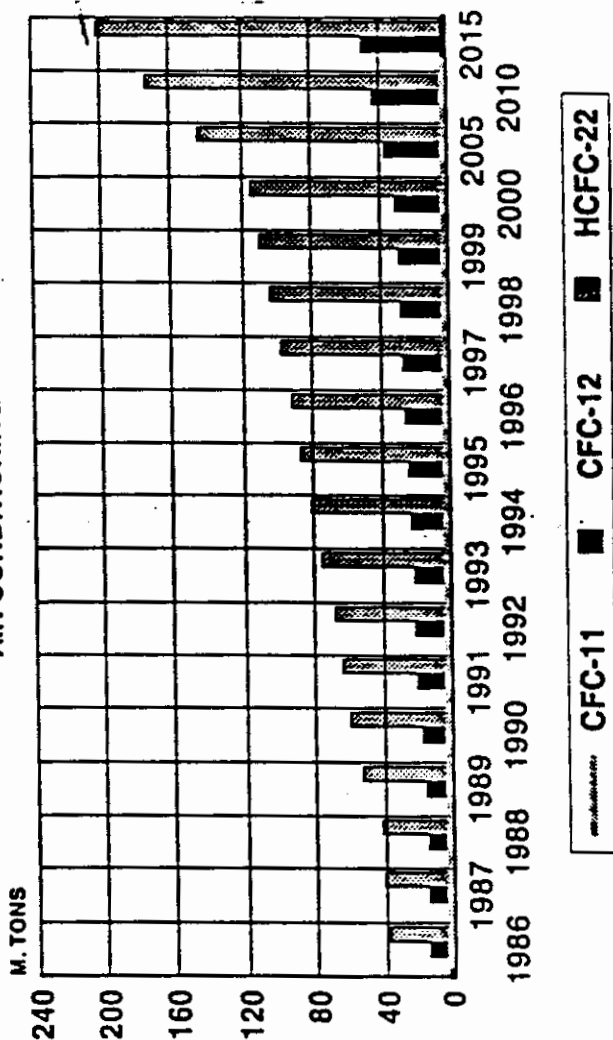
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CONSUMPTION FORECAST
TOTAL CFC - HCFC ON REFRIGERATION



Graf. Nº 6

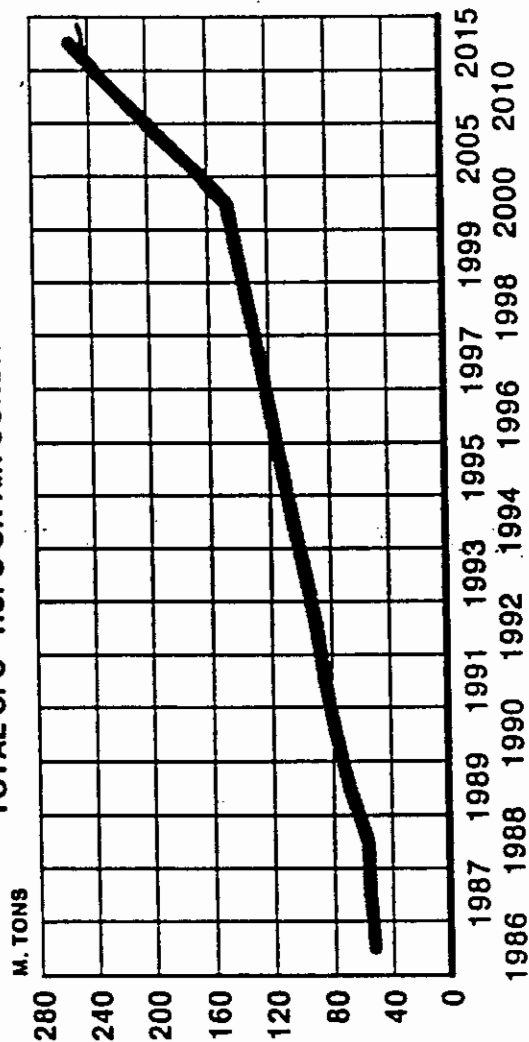
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CONSUMPTION FORECAST
AIR CONDITIONING



Graf. Nº 7

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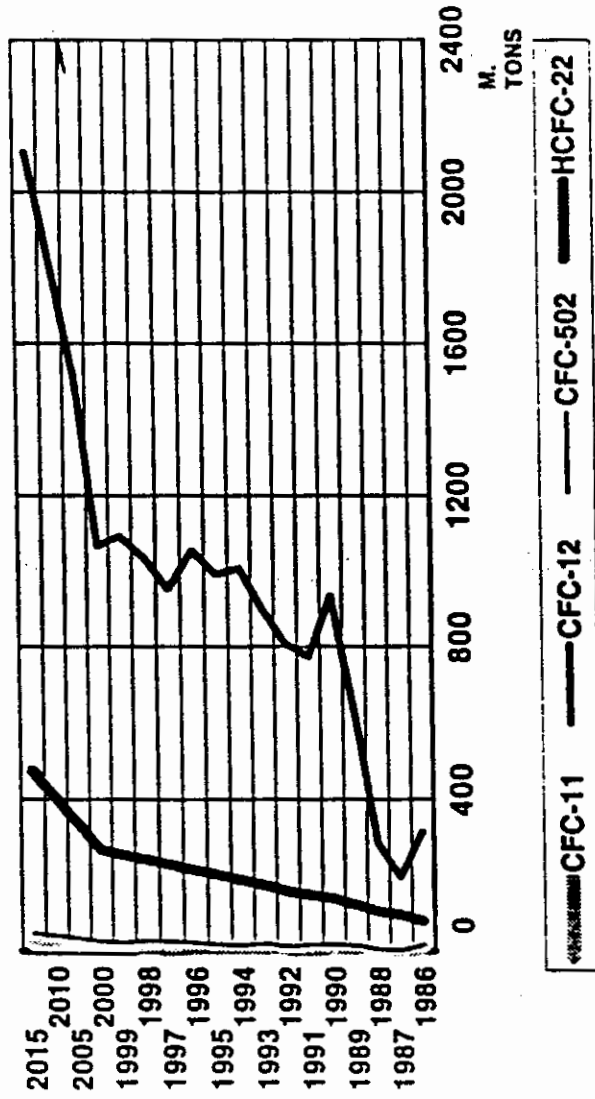
CONSUMPTION FORECAST
TOTAL CFC - HCFC ON AIR CONDITIONING



Graf. Nº 8

ODS

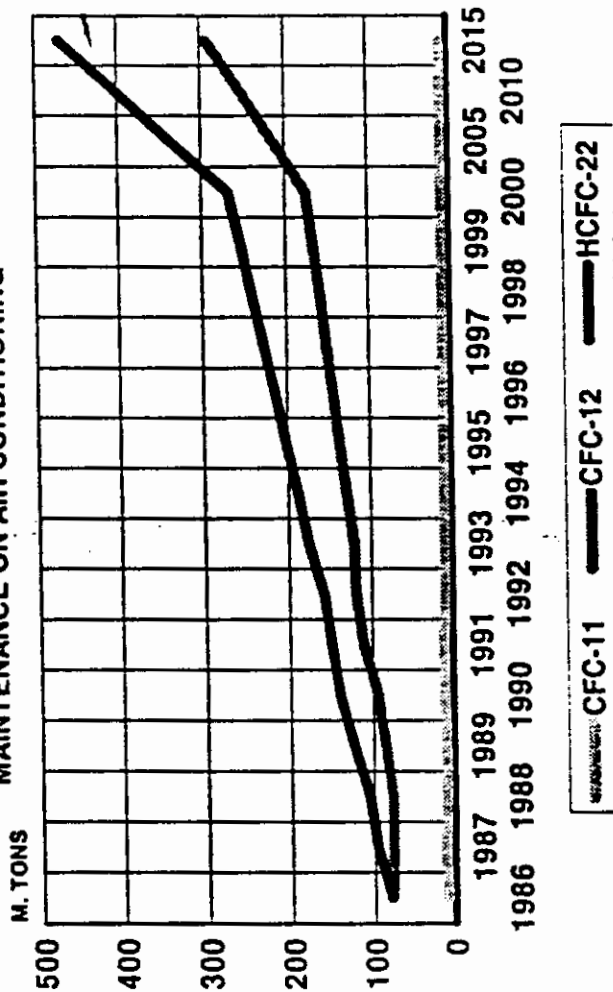
CONSUMPTION FORECAST
MAINTENANCE ON REFRIGERATION



Graf. Nº 9

ODS

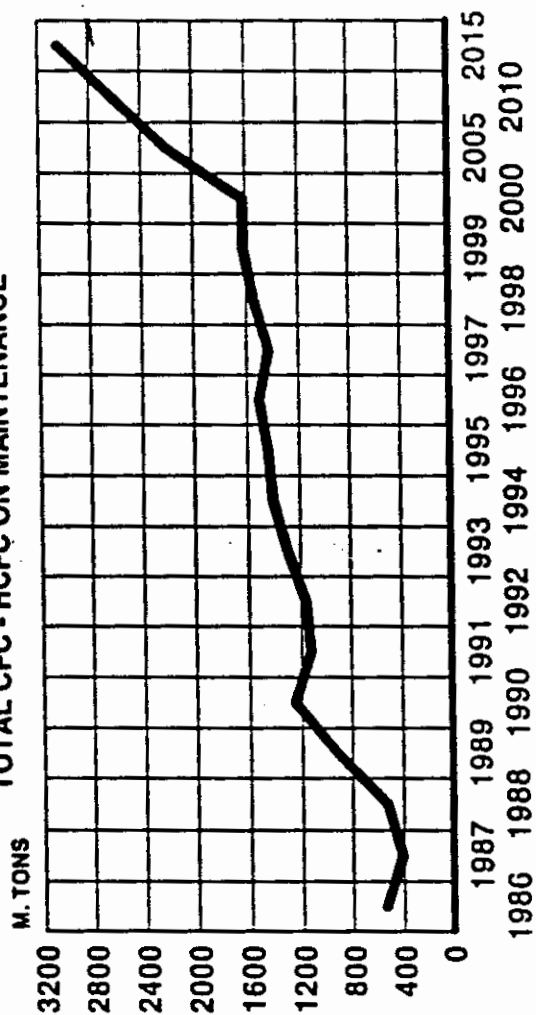
CONSUMPTION FORECAST
MAINTENANCE ON AIR CONDITIONING



Graf. Nº 10

ODS

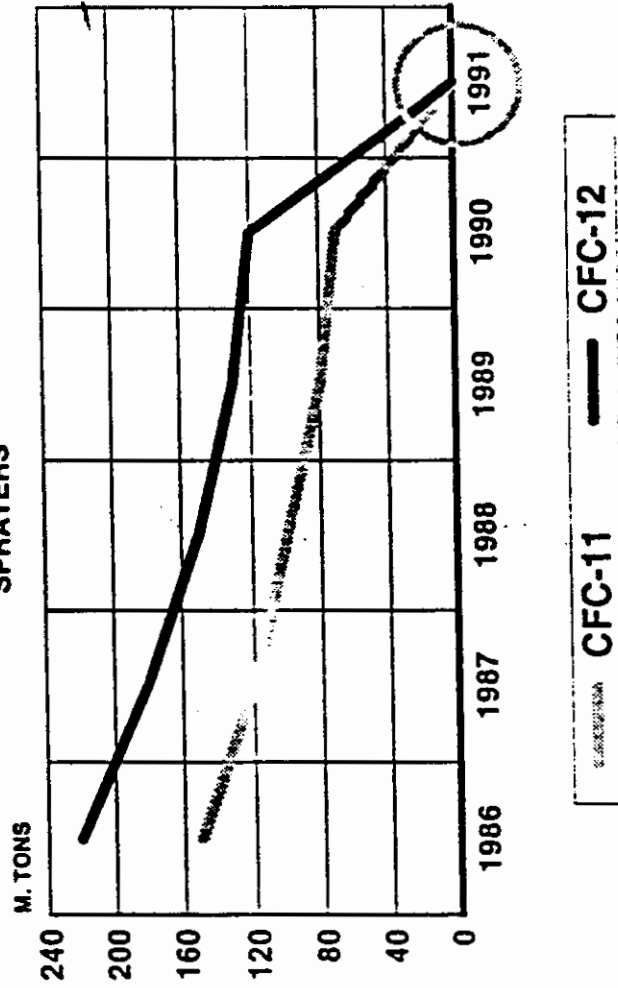
CONSUMPTION FORECAST
TOTAL CFC - HCFC ON MAINTENANCE



Graf. Nº 11

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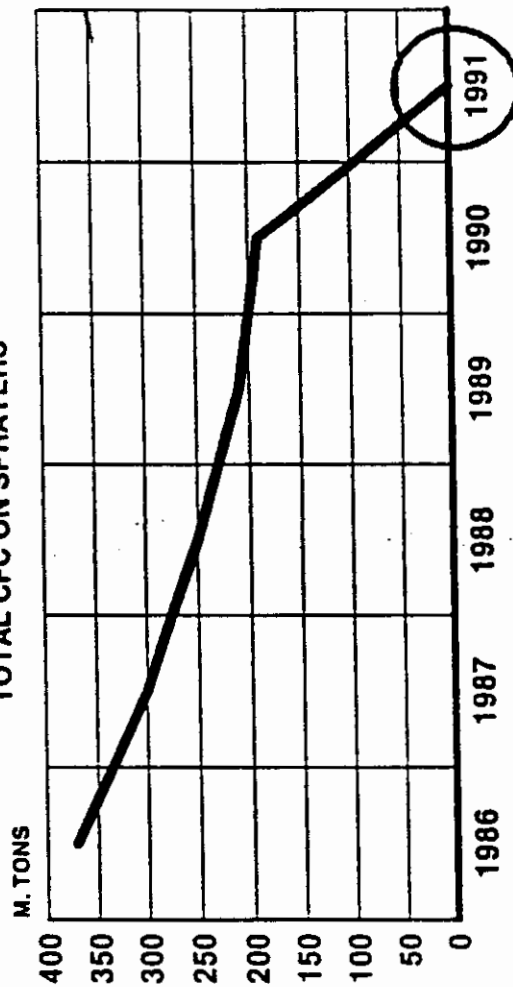
CONSUMPTION FORECAST
SPRAYERS



Graf. Nº 12

ODS

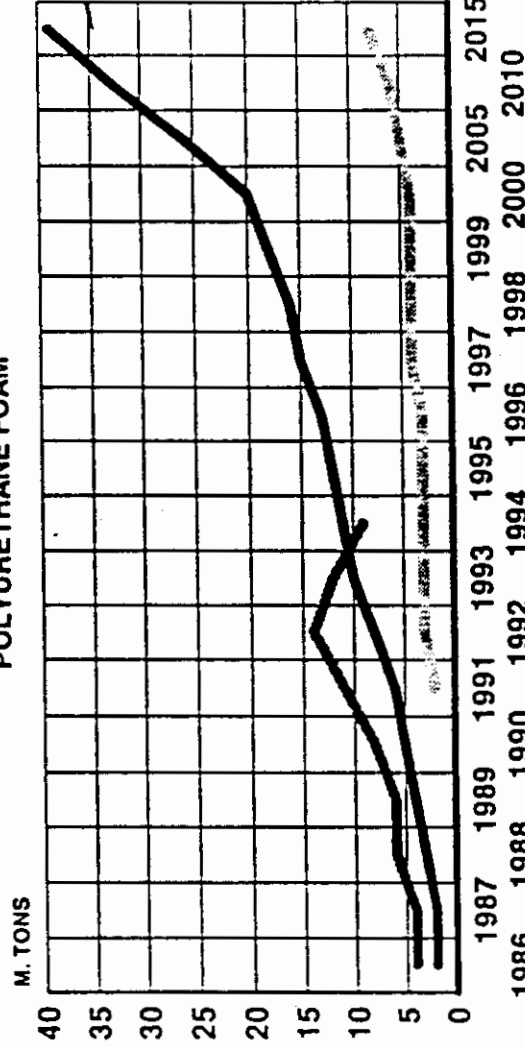
CONSUMPTION FORECAST
TOTAL CFC ON SPRAYERS



Graf. Nº 13

ODS

CONSUMPTION FORECAST POLYURETHANE FOAM



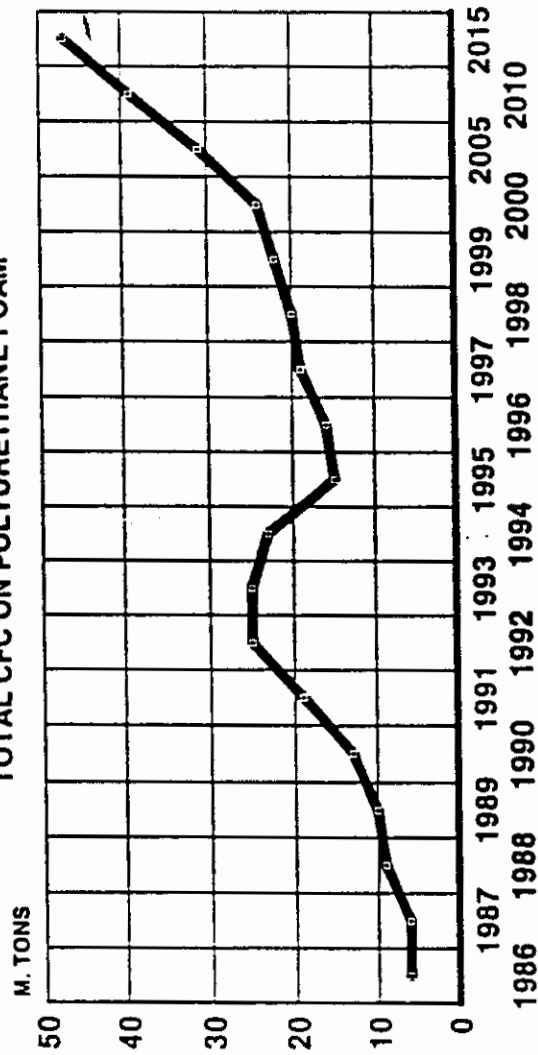
CFC-11

MOLDED FLEXIBLE FOAM
 SYNTHETIC COVERS
 FOOTWEAR

Graf. Nº 14

ODS

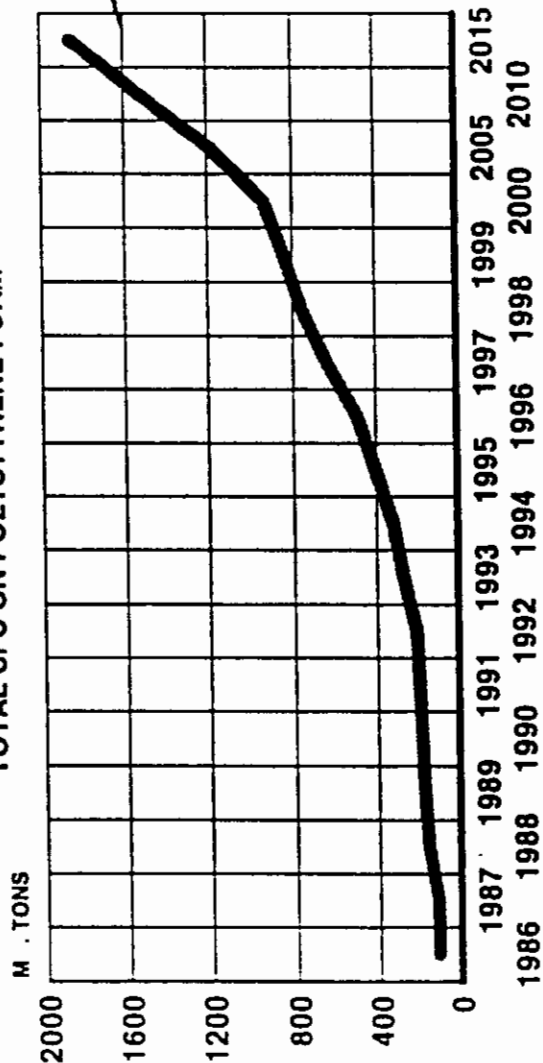
CONSUMPTION FORECAST
TOTAL CFC ON POLYURETHANE FOAM



Graf. Nº 15

ODS

CONSUMPTION FORECAST
TOTAL CFC ON POLYSTYRENE FOAM

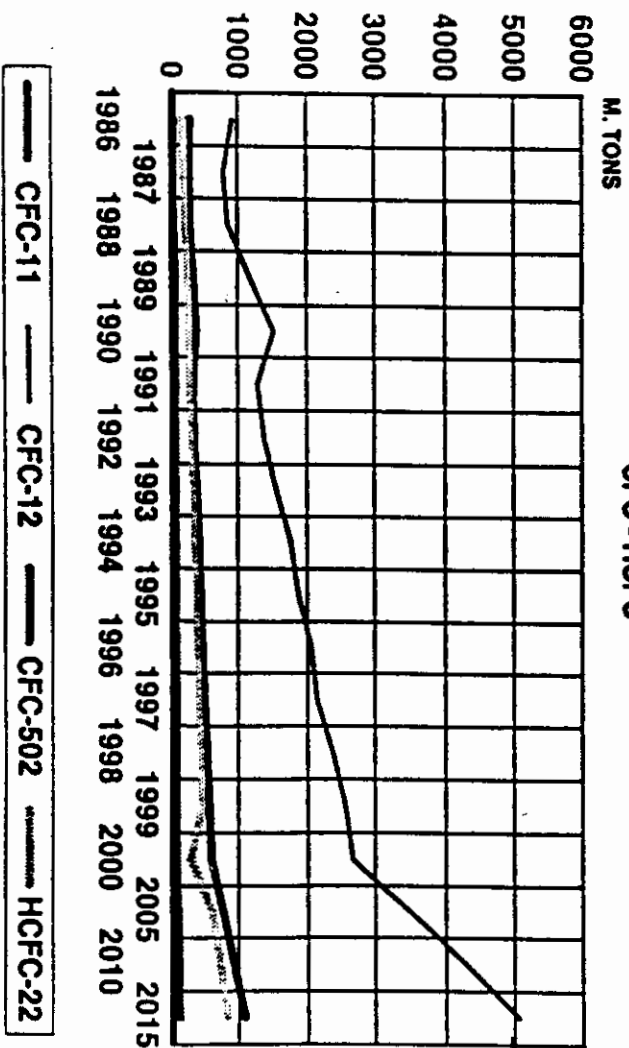


ODS

Graf. Nº 16

TOTAL CONSUMPTION FORECAST

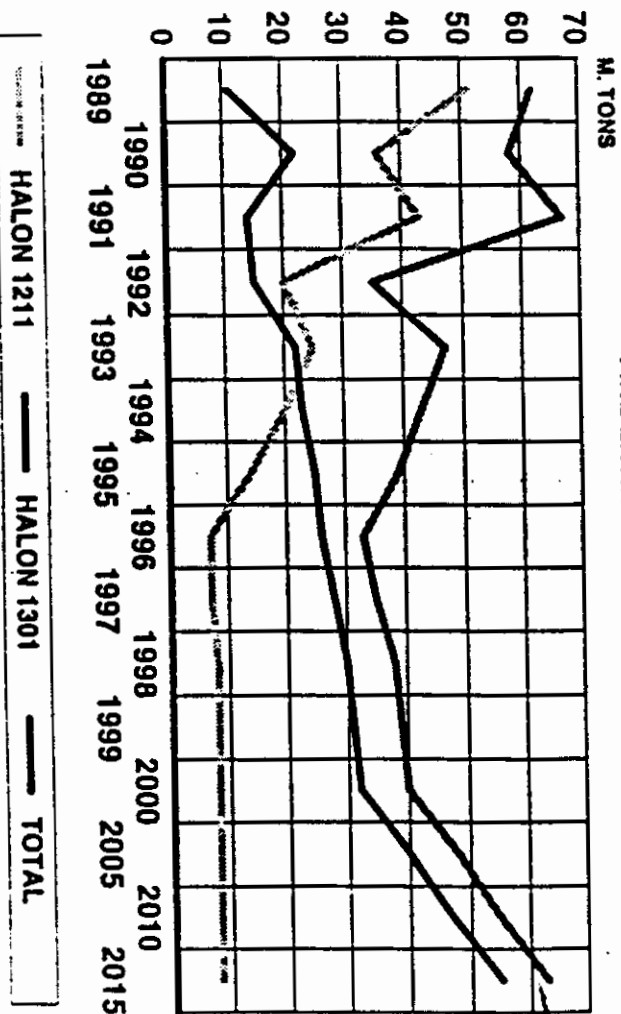
CFC - HCFC



ODS

Graf. № 17

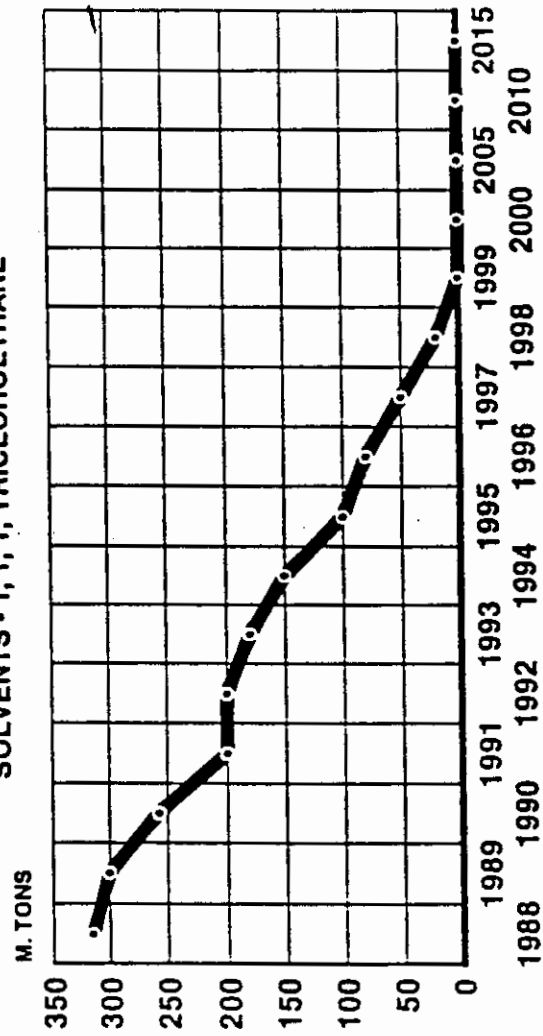
CONSUMPTION FORECAST FIRE EXTINGUISHERS



Graf. Nº 18

ODS

CONSUMPTION FORECAST
SOLVENTS - 1, 1, 1, TRICHLOROETHANE



Graf. Nº 19

ODS

CONSUMPTION FORECAST
PESTICIDES - METHYL BROMIDE

