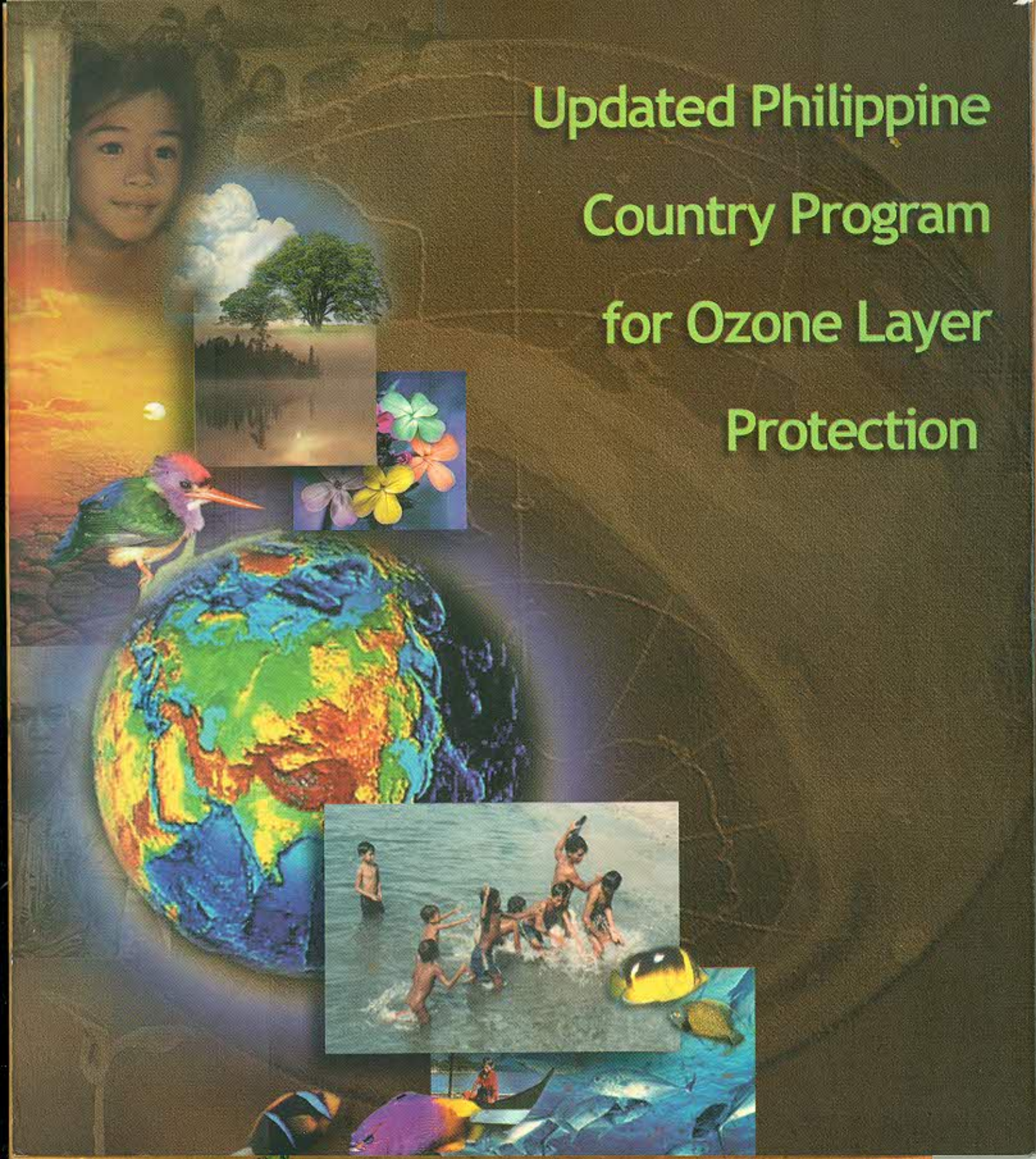
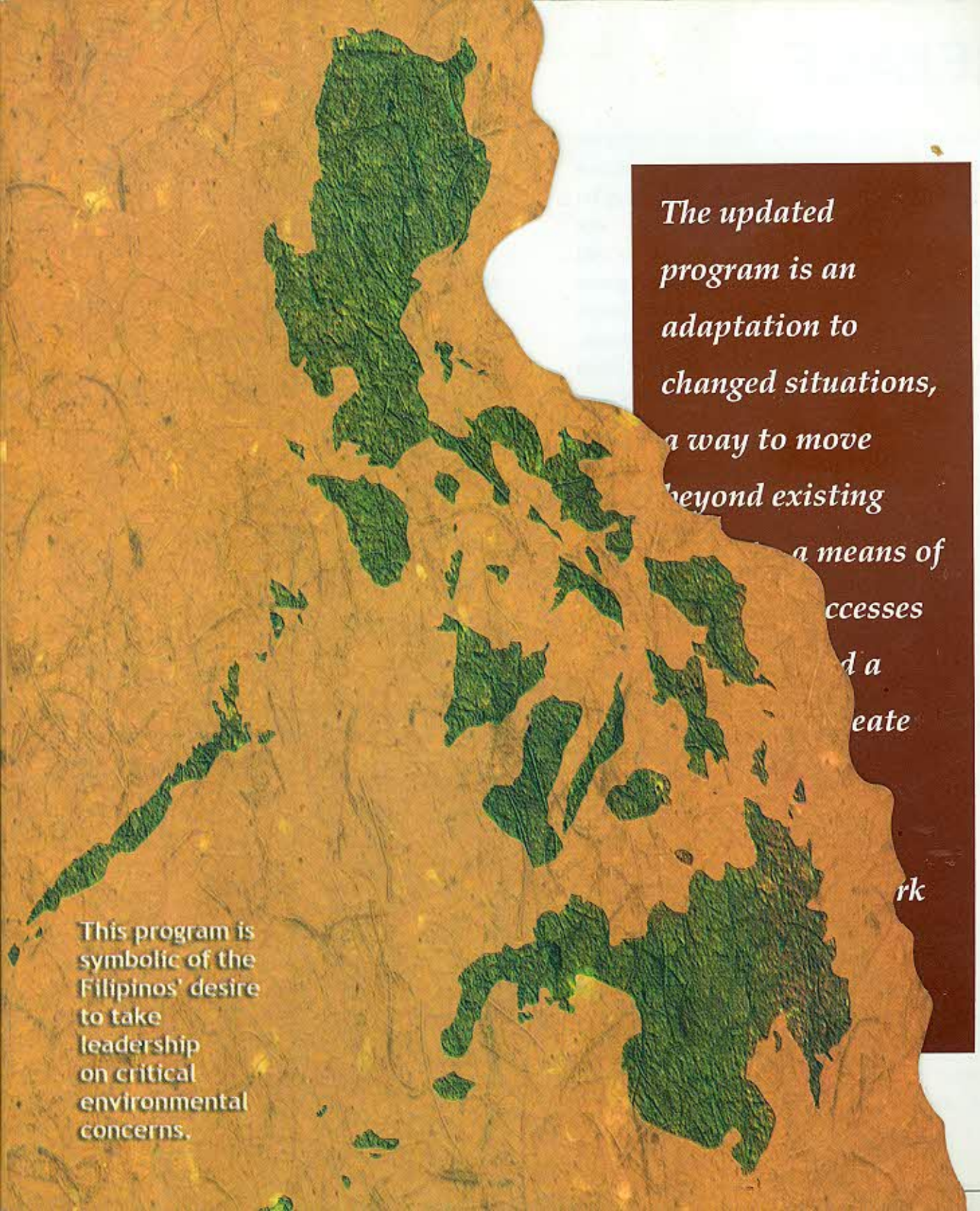
Updated Philippine Country Program for Ozone Layer Protection





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The updated program is an adaptation to changed situations, a way to move beyond existing projects, a means of utilizing successes achieved, and a strategy to create additional momentum to complete the work already started.

PREFACE

Since the implementation of the first Philippine Country Program on the Phaseout of Ozone Depleting Substances in 1993, thirty-four(34) investment projects have phased out approximately 1,300 MT of ODSs in forty-six (46) major industries by 1998. Phaseout programs included information and education campaigns that reached the general public through schools, regional fora and the media. As a result of these efforts, the Philippines received an "Outstanding National Ozone Unit Award for the Implementation of the Montreal Protocol" during the 9th Meeting of the Parties of the Montreal Protocol on Substances that Deplete the Ozone Layer. In 1997, the Department of Environment and Natural Resources (DENR), the United Nations Development Programme (UNDP), and participating industries received the prestigious Ozone Award from the United States Environmental Protection Agency (USEPA) for "Leadership in the Phaseout of ODS in the Solvent Sector".

More work still has to be done. The Philippine Country Program needs to be updated to bring in new activities and projects to meet the phaseout targets as well as to intensify follow-on efforts.

The Philippine Ozone Desk (POD), with support from the UNDP, commissioned the Philippine Institute for Development Studies (PIDS) to conduct the assessment needed to develop an updated program. The results were validated through consultations with industries, the POD and the Technical Working Group. Upon completion of the draft report, consultations were held in Luzon, Visayas and Mindanao to bring in inter-agency and multi-sectoral participation for data validation development of recommendations. The consolidated results were further developed and finalized in meetings with the Technical Working Group and the Program Steering Committee.

The "Updated Philippine Country Program for Ozone Layer Protection" represents a more positive and proactive approach to the phaseout of Ozone Depleting Substances (ODSs). Its purpose is not only ODS phaseout but also environmental education, capacity building, technology transfer and institutional strengthening. The lack of data in certain aspects was compensated by the highly participatory and multisectoral approach taken in its development.

The immediacy of its approval and implementation arises from the urgent need to bridge the gaps between the 1993 Country Program and the updated report. Perhaps, more importantly, it is symbolic of the Filipinos' desire to take leadership on critical environmental concerns.

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MALACAÑAN PALACE
MANILA

MESSAGE

The Philippines' basic development policy is that of sustainable development. As such, we shall always support every effort to protect and promote the environment and sustain its carrying capacity. As we are well aware of our inherent ecological interconnectedness in the only home we have, our Mother Earth, we shall do our utmost to protect its life-sustaining ecosystems.

Consisting with the policy, we have actively pursued the phasing out of Ozone Depleting Substances. Our goal is to accomplish what we have started and achieve the targets we have set for ourselves. Full implementation of this Updated Philippine Program for the Protection of the Ozone Layer will certainly guide us towards the fulfillment of this goal.

We therefore urge our fellow Filipinos from all sectors of the society as well as our friends in the international community to join us in this most challenging task.

"Nasa ating mga kamay ang kaligtasan ng mundong tahanan. Ang kasiraan ng ating kalikasan ay tiyak na karagdagang hirap para sa masang Pilipino.

Kaya't tayo'y magkaisa sa pangangalaga ng ating kapaligiran. Lagi nating tandaan na nasa ating mga kamay ang kaligtasan ng ating kapaligiran at ng mundong ating ginagalawan. Huwag nating hayaang masira ito.

Tayo'y magkaisa sa pangangalaga ng ating kapaligiran upang masiguro ang magandang kinabukasan, lalo na ng mga sumusunod na salinlahing Pilipino."

Mabuhay tayong lahat!

JOSEPH EJERCITO ESTRADA

MANILA
October 1999

Foreword

The programs prescribed under the 1993 Philippine Country Program on the Phaseout of Ozone Depleting Substances (ODS) have been substantially accomplished. Investment projects have successfully assisted large-scale industries dealing with refrigeration, foam-blowing, fire extinguishants, tobacco expansion, and electronics in shifting to more ozone-friendly technologies. Through the resources extended by the Montreal Protocol Multilateral Fund and the efforts of government, the level of public awareness has been raised on issues pertinent to ozone layer depletion.

However, there is an urgent need for follow up work. Small and medium-scale enterprises, particularly service shops, have to be identified and their needs assessed. Public information and education strategies should lead to a more proactive industrial sector and should encourage consumer action. Support fiscal, economic and market-based incentives for full ODS phaseout also need to be implemented.

This UPDATED PHILIPPINE COUNTRY PROGRAM FOR OZONE DEPLETION PROTECTION was developed to address emerging issues on production and consumption of ODS-using equipment and consumer products. Obviously, it assessed the dynamics of the country's business and industrial sectors as well as the consumers.

The formulation of this Country Program was an arduous task. On top of the research work and other antecedents, the same had to be subjected to multi-sectoral consultations in key industrial areas like Metro Manila, Cebu and Davao. An inter-agency referendum was even undertaken to ensure its acceptability among the members of the Program Steering Committee (PSC).

Therefore, this Philippine Country Program for Ozone Layer Protection is deemed duly approved for full implementation. All relevant government agencies as well as industry and NGO partners are now enjoined to give this program their commitment and active participation.

ANTONIO H. CERILLES
Secretary
Department of Environment and Natural Resources

Executive Summary

I. Background

The Montreal Protocol on Substances that Deplete the Ozone Layer was set into force on 1 January 1989. The Department of Environment and Natural Resources (DENR) acts as the national coordinator for its implementation in the Philippines. The first Philippine Country Program for the Phaseout of Ozone Depleting Substances (ODS) was prepared in May 1993. This Program specified the Philippine ODS phaseout schedules and laid out the plans, programs, and activities that the country would undertake in phasing out ODSs. As a developing country, the Philippines was provided with financial assistance from the Multilateral Fund for ODS phaseout projects.

Through the DENR Environmental Management Bureau (EMB), the Philippine Ozone Desk (POD) was created to facilitate and coordinate ODS phaseout projects and policies. Completed investment projects funded by the Multilateral Fund of the Montreal Protocol have phased out about 1,300 MT of ODSs in various industry sectors. Regulations were also issued to control ODS importation. An active information, education and communication program was implemented to make both the industry sector and general public aware of the ozone depletion problem and the need to support ODS phaseout.

For these efforts, the Philippines was awarded the "Outstanding National Ozone Unit Award for the Implementation of the Montreal Protocol" by the United Nations Environment Programme (UNEP) in 1997. During the same year, the country received another award for "Leadership in the Phaseout of ODS in the Solvent Sector" from USEPA.

II. Status of ODS Importation and Phaseout

CFC 12, the main cooling agent employed in refrigeration and air conditioning systems, is also used in aerosols and packaging foams. It accounts for the largest share of total ODS use, followed by CFC 11 (used in refrigeration, air conditioning, foams and tobacco expansion). CFCs 11 and 12 have a 97% share of total ODS controlled imports.

Total registered ODS imports for Annex A & B substances was 2,106 MT in 1998. Importations of individual substances, have been declining. Total ODS imports decreased steadily between 1995 and 1998 by 13 and 21% respectively.

For chemicals such as HCFC 22, importation has been steadily rising. This trend is expected to continue as these chemicals are being used as ODS alternatives.

Estimates show that there is a huge remaining demand for CFCs until the year 2000. CFC 12 demand from the Mobile Air Conditioners (MACs) service sector is estimated to increase from 1,005 MT in 1996 to 1,157 MT in 1998.

The demand for CFC 12 by the household refrigeration sector is expected to increase from 102 MT in 1998 to 181 MT in 2001. For the commercial and industrial refrigeration sector, the demand is expected to reach 373 MT in 1999, but would start to decline thereafter. For other stationary services, demand would remain at about 326 MT from 1997 to 1999 and would start declining by year 2000.

For Halon 1211, a chemical used as fire extinguishing agent, there is an ongoing project for its recovery and recycling. Effective implementation of the project is expected to phase out 25 MT of Halon 1211.

Small and medium enterprises (SMEs) which are mainly in the service sector are a cause for serious concern. Available data on ODS consumption is vague and insufficient. They comprise a large part of the remaining ODS users yet they have the least access to new information and available technologies for ODS phaseout.

There are certain tasks that are unfinished and have to be more vigorously pursued. These are (1) the development of an information system for ODS monitoring, (2) coordination with the Bureau of Customs to streamline ODS data collection, (3) clear public announcement of ODS phaseouts, and

(4) the development of more definitive policies regarding the ban of ODS-using equipment and on market-based incentives for shifts to non-ODS technology.

III. Updated Country Program

A. Recommended Phaseout Schedule

The present regulatory measure on the phaseout schedule will be maintained. This was decided upon by stockholders due to the cost burden of an accelerated phaseout. This allows increased possibilities for shifts to better and more permanent alternatives as new ozone-friendly substances and technologies are developed.

This updated program aims for acceleration through measures that encourage voluntary shifts to newer and more "environment-friendly" practices and technologies.

Therefore, the recommended phase out schedules for ODSs are as follows:

For CFCs 11 and 12: Importation for new[1] manufacturing will not be allowed by end of 1998 as prescribed under the 1993 PCP. For service[2], with 1996 as base year, there will be:

25% reduction by year 2001
50% reduction by year 2005
85% reduction by year 2008
100% reduction by year 2010

- For CFC 113,114,115 - No recorded importation[3] since 1997
- Halon 1211 - Reduce to essential uses by 1999
- Halon 1301 - Zero importation achieved in 1995
- 1.1.1. TCA - Zero importation by January 1999

B. Priority Measures

B.1 Trade Measures

The reduction of the importation of ODSs will be done through import clearance mechanisms and Chemical Control Orders issued by the DENR under Republic Act 6969, according to the agreed upon schedule. Regulation, including a ban on the importation of identified ODS-using equipment, should be developed through Chemical Control Orders, a policy of the Committee on Trade and Related Matters of the National Economic Development Authority (NEDA), and inclusion of such regulation under the Implementing Rules and Regulations of the Clean Air Act.

B.2 Training, Certification and Accreditation of Importers, Handlers and Service Technicians

A system which would only allow accredited importers to bring ODSs into the country needs to be set up. These importers would be required to submit a detailed report on the sale and consumption of these controlled substances.

Service technicians need to be trained in the proper operation, service and maintenance of recovery and recycling equipment in order to be accredited.

B.3 Information and Education Campaign

An intensive information and education campaign will be directed at the general public, specifically at consumers and small businesses (those in car repair, refrigeration, and air conditioning). Unlike large companies, consumers and SMEs do not have easy access to information about ODSs and their alternatives. In addition to general information, there will be focus on providing a good understanding of alternative substances, accessibility and availability, prices, and technology for retrofit or use. Labeling schemes to guide consumers should be implemented. The approach would involve various sectors and agencies in different field offices all over the country.

[1] New refers to CFCs issued in the production of new equipment and appliances.

[2] Service refers to CFCs issued in the servicing of old equipment containing said substances.

[3] EMB Data

B.4 Institutional Measures

The DENR's links with the Bureau of Customs and its network of export processing/free trade zones and banks regarding Central Bank Circulars on ODSs need to be strengthened. Support should be provided to its regional offices for more effective monitoring and information dissemination work. The Philippine Ozone Desk, the Technical Working Group and the Steering Committee should be strengthened in their mandate and membership to reflect new roles and broader inter-agency participation. The import clearance procedures should be streamlined to encourage full compliance and reporting.

B.5 Regular Review of the Country Program

There are deficiencies in data regarding consumption by sector and size of individual service sectors that use ODSs. Present data do not allow for the computation of the stock of commercial and industrial refrigerators as well as other stationary equipment. This would have been useful in establishing the ODS demand for their servicing. More detailed data will refine the measures laid out in this updated program so that greater focus and effectiveness can be achieved. Specific studies, surveys, regular monitoring and feedback systems for the program have to be implemented.

B.6 Ratification of the Copenhagen Amendment

The Philippine ratification of the Copenhagen Amendment to the Montreal Protocol is a priority measure.

The Philippines has accelerated its phase-out targets for CFCs, halons, other fully halogenated CFCs, carbon tetrachloride, and 1,1,1 trichloroethane earlier than the 2010 deadline required by the amendment. For HCFC, the country is seen to have no problem reducing its consupmtion to zero by 2040.

A freeze in Methyl Bromide consumption by 2002 is also well within the country's capability. A project called *"Demonstration, Training and Policy Development on Alternatives to Methyl Bromide in Banana Soil Fumigation"* is being implemented. The issue of importing countries requiring Methyl Bromide fumigation for agricultural product exports will have to studied.

C. Supplementary Measures

These measures include the following:

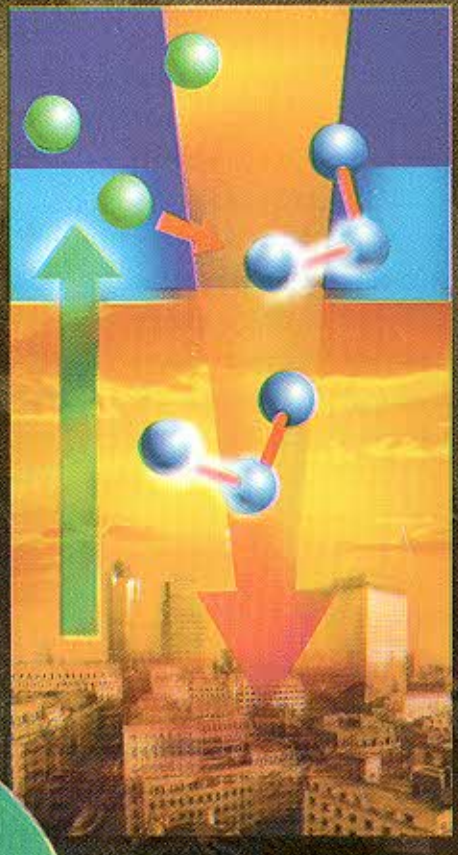
1. Fiscal measures such as BOI incentives for use of non-ODS equipment and the legislation of environmental taxes on ODSs and ODS-using equipment;

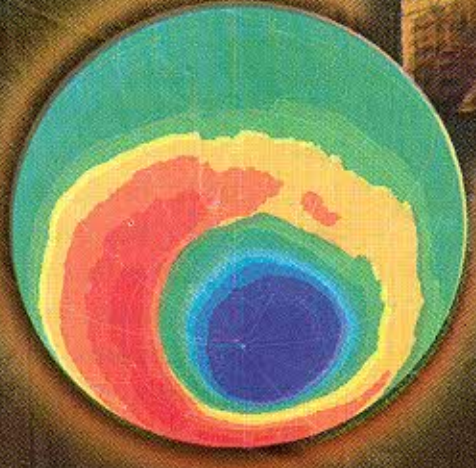
2. Trade measures include legislation of higher tariffs on ODSs;

3. Other measures such as:

a) the continued search for alternatives;
b) the interaction with other related conventions (i.e. on Climate Change);
c) the use of ECC requirements to encourage non-ODS use;
d) the separation by the Tarriff Commission of headings for identified ODSs;
e) the establishment of clear definitions of essential uses for halons;
f) the exploration of locally designed and produced recovery and recycling; equipment;
g) the establishment of a trust fund; and
h) the exploration of export country liability for contrabands

Ozone Layer Depletion
A Backgrounder





I. Ozone Layer Depletion: A Backgrounder

The ozone layer is a thin veil of molecules in the stratosphere.[1] It blocks most of the ultraviolet radiation in the 290 to 320 mm range (known as the ultraviolet-B or UV -B range) from reaching the Earth's surface.

In the last two decades, stratospheric ozone depletion[2] has been a major environmental issue. The discovery of the Antarctic "ozone hole" in 1985 produced worldwide alarm about the adverse effects of a damaged ozone layer on human health and ecosystems. A decline in the total column content of ozone leads to an increase in the amount of UV-B radiation reaching the Earth's surface. A thinner ozone shield would permit biologically harmful UV-B radiation to reach the Earth, increasing the potential for skin cancer, eye disorders, suppression of the immune response system and other health related abnormalities. Scientific and public anxiety about the fate of the Earth's ozone layer further deepened as new information indicated that the ozone losses were not confined to the Antarctic. News broke out that similar, though less dramatic, ozone losses were detected at the North Pole and over populated parts of the Northern Hemisphere.

Scientific evidence confirms that ozone losses are caused by human-made compounds containing chlorine and bromine -- such as chlorofluorocarbons (CFCs) and halons-- released in the atmosphere. CFCs are an entirely man-made family of industrial gases. When they were developed in the 1930s, they revolutionalized household and commercial refrigeration and made automobile air conditioning possible. CFCs were also used as propellant in aerosol spray cans, as blowing agent in foams and highly insulating materials, and as solvents to clean computer chips.

These inexpensive and versatile compounds are odorless, non-flammable, non-corrosive, and non-toxic. They were considered as "miracle compounds" by the chemical industry. Little did people know that CFCs would one day be identified as the leading cause of stratospheric ozone depletion and as a large contributor to the greenhouse effect. CFCs are efficient ozone killers. One CFC-spawned chlorine atom can catalyze the destruction of as many as 100,000 ozone molecules. Halons,

[1] The stratosphere refers to the upper atmosphere. It extends from the tropopause to about 50 kilometers above the earth's surface, and has a comparatively low water vapor content compared to the troposphere. The ozone layer, which shields the earth from ultraviolet radiation, is located in the stratosphere. The tropopause is the boundary between the troposphere and the stratosphere. The troposphere is the lower atmosphere from the ground to an altitude of about 8 kilometers at the poles, about 12 kilometers in midaltitude, and about 16 kilometers in the tropics. Clouds and weather systems take place in the troposphere.

[2] The ozone hole is defined as the area having less than 220 Dobson units (DU) of ozone in the overhead column, i.e., between the ground and space (US EPA, 1995).

which are mainly used as fire extinguishing agents, are similar to CFCs in structure but contain bromine atoms that are more dangerous to ozone than CFCs.

The ozone depletion and subsequent increase in UV-B radiation is a problem of global proportions. The past several years witnessed the relatively quick response of the international community to the steadily worsening ozone layer depletion. This led to the adoption of the Montreal Protocol in September 1987. It was entered into force on 1 January 1989 by 73 countries, including the Philippines. To date, over 167 countries are Parties to the Protocol.

The Montreal Protocol aims to curb the levels of chlorine and bromine that destroy the Ozone Layer. It sets the limits for the production and consumption of damaging CFCs and halons. The agreement commits signatories to regulate trade of these controlled substances and products containing these substances.

The Philippines signed the Montreal Protocol on September 14, 1988. With the presence of strong public sentiment to protect the ozone layer, the Philippine Senate ratified it on March 21, 1991. The 1990 London Amendment to the Protocol was approved in March 1993.

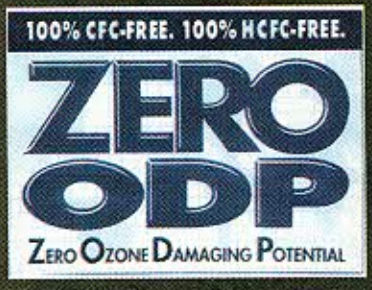
At present, many countries are accelerating ODS phaseout. The global production of CFCs from 1950 to 1992 steadily declined after reaching its peak in 1988. In 1992, CFC production was 50 % lower than the 1988 level.

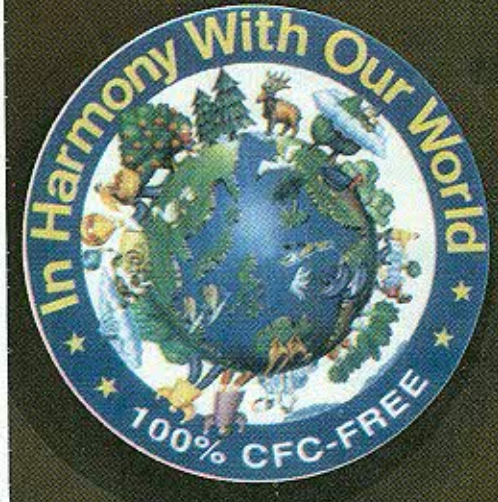
The Montreal Protocol is an international environmental agreement requiring political will. Financial assistance from the Multilateral Fund has helped developing countries shift to alternative non-ODS using technologies and has gone a long way in the implementation of the Montreal Protocol. Some industries were also provided with technical assistance in the use of alternative chemicals. For instance, industries from the solvent sector are provided with options to shift to water-based technologies, alcohol, "no clean" technologies and to other non-ODS alternative chemicals.

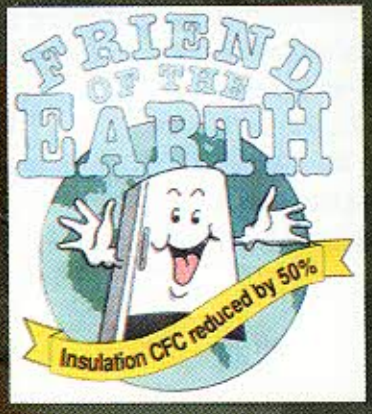
The Montreal Protocol sets the limits for the production and consumption of damaging CFCs and halons .

Non-ODS alternatives are usually more expensive. Suitable substitutes cost one and a half to five times more than CFCs, which are mass-produced from cheap feedstocks. Moreover, some non-ODS substitutes contribute to global warming. The Environmental Almanac (1994) reported that CFC alternatives such as hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) are not long-term solutions to the ozone layer depletion problem. HCFCs still release chlorine gases -- though only at a fraction of the rate of CFCs. HFCs, though they do not contain chlorine, are potent greenhouse gases.

Progress in the 1993 Philippine Country Program







II Progress in the Implementation of the 1993 Philippine Country Program

A. The Phaseout Schedule

As part of its commitment to Montreal Protocol, the Philippines established its ODS phaseout schedule. Table 1 contains a list of controlled substances under the Montreal Protocol. The Philippines is not a producer of ODSs and demand for these substances is met by imports primarily from developed countries. The regulation of ODS is covered under Republic Act 6969 " *Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990* ". The issuance of Departmental Administrative Order 29 strengthens the procedures for restricting ODS imports. Through these promulgations, the EMB controls ODS importation and disallows their importation on the dates indicated except for "service" and "essential uses".

B. Government Action Plan

The government, through the EMB-DENR has instituted a wide range of policies in implementing the 1993 Philippine Country Program. These policies consist of institutional and regulatory measures, information awareness, investment technical assistance, and monitoring (refer to Table 2). Through its import licensing procedure, the EMB is able to control the importation and consumption of ozone depleting substances.

A review of the Action Plan of the government as indicated in the 1993 Country Program reveals that the DENR (Philippine Ozone Desk) was able to accomplish the following tasks:

- issuance of government legislations to control the importation of ozone depleting substances
- creation of the Philippine Ozone Desk (POD) to facilitate and coordinate ODS phaseoutprojects and policies
- holding of industry consultations and workshops on the Philippine Country Program
- implementation of the first tranche of investment projects under the Multilateral Fund

Certain activities still need to be followed-up. They are as follows:

- development of an information system for ODS monitoring
- coordination with the Bureau of Customs to streamline ODS data collection
- banning of on ODS-using equipment
- granting of market-based incentives to firms shifting to non-ODS technology

Table 1: List of Ozone Depleting Substances Under The Montreal Protocol With Recorded Importation in the Philippines

Common Name	Scientific Name	Chemical Formula	Ozone Depleting Potential (ODP)	Common Uses
CFC 11	Trichlorofluoromethane	$CFCl_3$	1.0	• Blowing Agent • Propellant
CFC 12	Dichlorodifluoromethane	CF_2Cl_2	1.0	• Refrigerant • Propellant • Blowing Agent
CFC 13	Chlorotrifluoromethane	CF_3Cl	1.0	• Refrigerant
CFC 113	Trichlorotrifluoromethane	$C_2F_3Cl_3$	0.8	• Cleaning Agent • Solvent
CFC 114	Dichlorotetrafluoroethane	$C_2F_4Cl_2$	1.0	• Cleaning Agent • Solvent
CFC 115	Chloropentafluoroethane	C_2F_5Cl	0.6	• Refrigerant
CFC 502	48.8% - HCFC 22 51.2% - CFC 115	Blend of CFC 115/F18 HCFC 22	0.34	• Refrigerant
Halon 1211	Bromochlorodifluoro-methane	CF_2BrCl	3.0	• Fire Extinguishant
Halon 1301	Bromotrifluoromethane	CF_3Br	10.0	• Fire Extinguishant
Halon 2402	Dibromotetrafluoroethane	$C_2F_4Br_2$	6.0	• Fire Extinguishant
Carbon Tetrachloride	Tetrachloromethane	CC14	1.1	• Cleaning Agent • Solvent
1,1,1 TCA Methyl Chloroform	Trichloroethane	$C_2H_3Cl_3$	0.1	• Cleaning Agent • Solvent
HCFC 22	Chlorodifluoromethane	CHF_2Cl	0.55	• Refrigerant
HCFC 123	Dichlorotrifluoroethane	$C_2HF_3Cl_2$	0.02	• Refrigerant/Blowing Agent
HCFC 124	Chlorotetrafluoroethane	C_2HF_4Cl		• Refrigerant/Blowing Agent
HCFC 141B	Dichlorofluoroethane	CH_3CFCl_2	0.11	• Blowing Agent
Annex E				
Methyl Bromide	Bromomethane	CH_3Br	0.6	• Soil Fumigant • Quarantine Treatment • Post Harvest Treatment

Table 2: Review of Government Action as Indicated in the 1993 Country Program

Goverment Action	Intended Effects	Current Status
Trade Measures		
Issuance of DAO Implementation Rules and Regulations for RA 6969	Strengthening the procedures for ODS imports	• DAO 29 (1992) • Issuance of Priority Chemicals List • draft CCO
Issuance of importation clearance under RA 6969	Ensuring the compliance to timetables set for reducing ODS and tracking the consumption of ODS	• Implemented by EMB/POD
Prescription of import quotas	Establishing a method to set reference for ODS reduction	• Carried out by POD
Institutional Measures		
Creation of DENR Ozone Desk and ODS Interagency Committee Development and establishment of an information system to monitor and track ODS consumption Coordination with BOC to streamline ODS data collection	Facilitating and coordinating ODS phaseout projects and policies Monitoring import reduction and collection of national data on ODS consumption Ensuring the effective tracking of ODS imports	• Need to strengthen EMB • Need to establish a computer-based network infrastructure • Currently being addressed, with MOA
Information and Education Campaign		
Initiation of industry consultations and regional conference/workshop on Country Program	Facilitating communication and cooperation for ODS reduction	• Completed
Announcement of ODS phaseout schedules was made	Ensuring the timely compliance on reduction of controlled substances as scheduled in the Country Program	• Last announcement was on Jan. 1999.
Fiscal Measures		
Waiving of duties for five years on imported HCFCs and HCFs in 1994 by the BOI	Reducing ODS consumption	• Delayed
Requiring new firms seeking BOI incentives to install ODS-free technology	Reducing ODS consumption	• 1999 BOI Investment Priorities Plan
ODS Phaseout Projects		
Timely implementation of the first tranche of investment projects	Achieving about 829 ODP weighted MT out of total consumption of 2660 ODP weighted MT	• Completed

C. Multilateral Fund

The Multilateral Fund was established as the financial mechanism of the Montreal Protocol. The Fund provides financial and technical assistance which enable developing countries with low ODS consumption (per capita annual consumption of Annex A substances is less than 0.3 kilogram) to meet the incremental cost of adopting the control measures of the Protocol. The Fund is managed by an Executive Committee made up of fourteen (14) members with equal representation from developing and developed nations. It is currently implemented by four agencies, namely: United Nations Development Program (UNDP), World Bank, United Nations Environment Program (UNEP), and United Nations Industrial Development Organization (UNIDO).

The Fund provides financial and technical assistance which enable developing countries with low ODS consumption to meet the incremental cost of adopting the control measures of the Protocol

To date, there are thirty-four (34) projects (see Box 2) approved by the Executive Committee of the Multilateral Fund for the Philippines, including fifteen (15) non-investment projects (see Table 3.1). The completed investment projects have phased out about 1000.7 MT of ODS in the respective industry sectors (see Table 3.2). There are fourteen (14) on-going investment projects. A total of 639 MT is expected to be phased out once these projects are completed. (see Table 3.3).

Box 2: Summary of Philippine ODS Phaseout Projects Under the Multilateral Fund

Type of Project	Number of Projects	Total Cost (US $ million)	Amount of ODS to be Eliminated (ODP MT)	Number of Completed Projects
Non-investment Projects	15	1.23	N.A.	12
Investment Projects	34	17.42	1,639.87	18

Table 3.1 : List of Non-Investment Projects as of December 1998

Project Title	Participating Agency	Total Cost (US$)
A. Completed Projects		
1. Country Study on the Use of ODS in the Philippines (pre-investment)	UNDP	79,460
2. Survey of ODS Usage, Data Base Generation and Technical Assistance for ODS Phaseout of Small Scale Enterprises Using ODS	UNDP	100,000
3. Design and Establishment of a Computerized Database Systems Framework for the Tracking and Monitoring of Inputs and Usage and Consumption of ODS	UNDP	22,750
4. Refrigeration and MACs Recycling Feasibility Study (pre-investment)	UNDP/ USEPA	160,000
5. Public Information Campaign	UNDP	65,000
6. Seminar on Commercial and Industrial Refrigeration and Airconditioning Systems	UNDP *	
7. Seminar for Solvent Sector	UNDP *	
8. Workshop on the Phaseout and Alternatives to CTC Technology	World Bank	
9. Feasibility Study on Foams, Tobacco, and Solvents Sector in the Philippines		200,000
10. Survey of Methyl Bromide Usage in the Philippines	UNDP *	45,000
11. Project Preparation Assistance - Solvents (Phase II)	UNDP	25,000
12. Financial Intermediary Technical Assistance for Institutional Strengthening	World Bank	100,000
Sub-total		797,210
B. On-going Projects		
1. Philippine Country Program Updating	UNDP	34,000
3. DENR Technical Assistance for Institutional Strengthening	World Bank	200,000
5. Philippine Information Dissemination Project	UNEP	200,000
Sub-total		434,000
Total		**1,231,210**

Table 3.2 : List of Completed Investment Projects as of February 1999.

Chemical / Industry Sector / Recipient Firm	Agency	Amount of ODS to be eliminated (ODP MT)	Grant Amount (US$)
CFC 12			
Foam Packaging	UNDP	49	582,400
1. Concept Packaging			
2. AMTES Corporation			
3. Q.C. Styropackaging			
4. Styrotech Corporation			
CFC 11			
Rigid Foam			
1. Nikon Corp.	UNDP	15	315,000
2. Himalaya Mfg. Corp.	UNDP	17	101,000
Flexible Foam			
1. Mandaue Foam (CFC 11)	UNDP	80	217,000
2. Foamcraft Inc. (CFC 11)	UNDP	90	185,000
3. RGC Foam Group Polyfoam/ Uratex (CFC 11)	UNDP	72	650,000
Foam Blowing			
1. MEPCO (CFC 11 & 12)	UNDP	40.12 17.43	122,244
2. Sanyo Phils (CFC 11)	World Bank	31.43	605,562
3. Concepcion Industries (CFC 11)	World Bank	78.3	725,052
4. Transunion (CFC 11)	World Bank	26.44	746,900
5. Philacor (CFC 11)	World Bank	310.55	1,716,900
6. Unimagma (CFC 11 & 12)	UNDP	30	1,015,700
CFC 113, TCA			
Solvent			
1. Ionics Corp. (CFC 113 & TCA)	World Bank	78.4 7.3	766,300
2. Electronic Assemblies (CFC 113)	World Bank	4.16	656,693
3. Amine, Clearfield, Ortho, Scientific Industries. Strongbase Corp. (CFC 113) (TCA)	UNDP	53.6	642,800
TOTAL		**1,000.73**	**9,048,551**

Table 3.3 : List of On-going Projects

Chemical / Industry Sector / Recipient Firm	Agency	Amount of ODS to be eliminated (ODP MT)	Grant Amount (US$)
Flexible Foam (CFC 11)			
1. Dai-ichi, Durafoam, Lastex,Golden Portals, Everfoam, Foamtech, Megafoam	UNDP	35	745,000
2. Soutech Development Corporation	UNDP	20	326,750
Rigid Foam (CFC 11)			
1. Ashlar, Alen, Zegal Plastics	UNDP	5.1	393,90
Building Insulation and Other Foam (CFC 11)			
1. MBA Urethane	UNDP	15	113,574
2. PU Rigid Insulation	UNDP	25	189,290
3. Metal Forming Corporation	UNDP	50	305,000
Refrigeration: Commercial and Industrial (CFC 11. CFC 12, R502)			
1. Gomeco, Chee Puck, Wellbilt (Umbrella Project) (CFC 11 & 12, R502)	UNDP	21.68 8.49 0.5	156,475
2. Azkcon Refrigeration Industries	UNDP	18.1	327,662
Refrigeration: Household			
1. Concepcion Industries, Sanyo, Transunion Philacor (Umbrella Project) (CFC 12)	World Bank	29.31	465,480
MACs Service			
1. Metro Manila MACs Recycling Scheme (CFC 11)	UNDP	between 6-11	285,000
Refrigeration Recovery and Recycling			
1. National Refrigerant Recovery and Recycling Scheme for the Philippines (CFC 11, CFC 12, R502)	UNIDO	60	630,000
Tobacco Expansion			
1. Fortune Tobacco (CFC 11)	World Bank	300	4,322,204
CFC 113,TCA Solvent			
1. Integrated Microelectronics (CFC 113)	World Bank	14.96	346,604
2. Ariad, Cloissone, Rodler, Redisol (Solvents Phase II)	UNDP		
Halon 1211 Fire Extinguishing			
1. Excelta Trading	UNDP	25	114,108
Methyl Bromide			
"Demonstration, Training and Policy Development on Alternatives to Methyl Bromide in Banana Soil Fumigation."	UNDP	34	230,000
TOTAL			
		639.14	**8,366,597**

Issues on ODS Consumption

III. Issues on ODS Consumption & Importation

A. ODS Importation

Data gathered by the EMB showed that TCA (methyl chloroform) importation steadily decreased from 1992 to 1996. In 1997, there was no TCA importation recorded.

Data gathered by the Bureau of Customs, however, revealed that 169 MT of TCA was imported in 1997. This discrepancy is due to the fact that TCA was incorrectly listed under Central Bank Circular 1389.

Table 4 shows that CFCs comprise the bulk of ODS controlled imports by the Philippines. From 1995 to 1997, the importation of both CFCs and Halon chemicals steadily dropped. The declining trend in the importation of ODS controlled substances may imply that the phaseout targets are attainable and feasible. HCFCs have been rising continuously between 1992 and 1997.

CFC 12 accounts for the largest share of total ODS use, followed by CFC 11. In 1998, CFC 11 and CFC 12 had a combined share of 98.9 % of total ODS imports. Based on EMB data presented in Table 4 total ODS importation was estimated at 4,252 MT in 1992. This declined by 25 percent in 1993, but rose by 31 percent in 1994. Between 1995 and 1997, the total importation of these controlled substances declined steadily. ODS imports dropped by 13 percent annually for the years 1995 and 1996. In 1997, ODS importation again declined by 15 percent. During this year, a total importation of 2,686 MT was recorded. In 1998, ODS importation further declined by 20 percent, with only 2,146 MT of imports recorded.

Except for Halon 1211, the importation trends for individual ODSs declined from the years 1995-1998.

While the importation of CFC 12 increased by five percent in 1996, this dropped by nine percent in 1997. This further dropped by 1 percent in 1998.

CFC 11 importation decreased by 38 percent in 1996 and further declined by 19 percent in 1997. A dramatic decline of 77 percent was observed in 1998.

CFC 113 importation dropped by 53 percent between 1995 and 1996 and in 1997, its importation was reduced to zero, which remained the same until 1998.

In the Philippines, CFC 12 accounts for the largest share of total ODS use, followed by CFC 11.

In 1997,CFC 11 and CFC 12 had a combined share of 97% of total ODS controlled imports.

From 1995 to 1998, the importation of both CFCs and halons have steadily dropped.

Table 4: ODS Imports (in MT)

ODS	1991	1992	1993	1994	1995	1996	1997	1998
Annex A Chemicals								
CFC 11	1022	1611	997	1727	1244	789	629	123
CFC 12	1450	1736	1911	2133	2095	2199	2001	1960
CFC 113	112	193	45	46	66	31	0	0
CFC 115	10	0	14	2	6	0	0.75	0
CFC 502	35	40	45	43	28	19	13	7
Halon 1211	0	43	7	24	34	39	42	16
Total A	2629	3623	3019	3975	3473	3062	2686	2106
Annex B Chemicals								
CTC	0	121	40	122	101	60	0	0
TCA	0	551	155	120	80	39	0	0
Total B	0	672	195	242	181	99	0	0
Total A & B	2629	4295	3214	4217	3654	3161	2686	2106

Source : EMB-DENR

The declining trend in the importation of ODS controlled substances may imply that the phaseout targets are attainable and feasible.

Figure 1a: Importation of Annex A Chemicals (1991-1998)

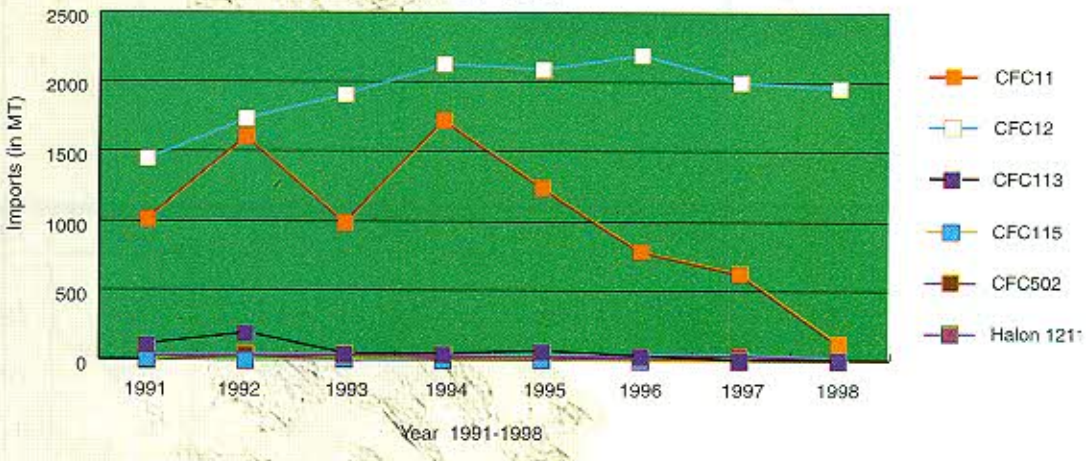


Figure 1b: Importation of Annex B Chemicals (1991-1998)

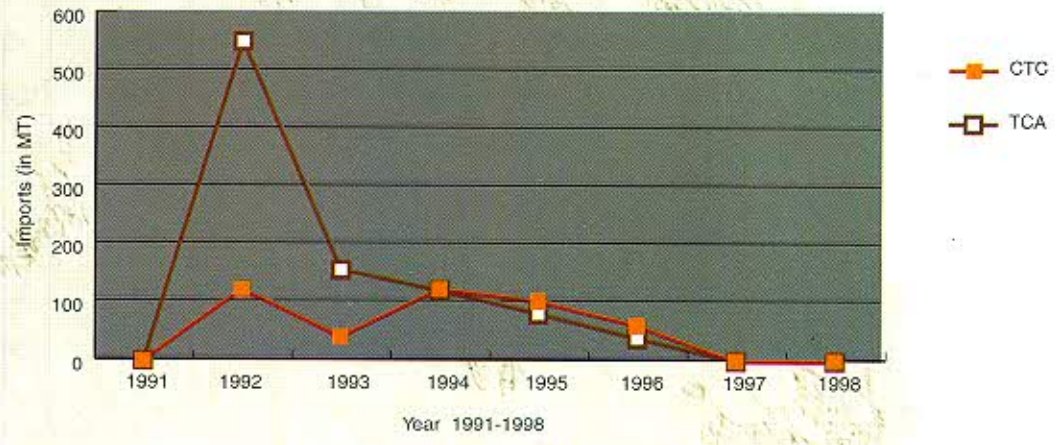


Figure 1c: Percent share of major ODS for 1998 (per EMB records)

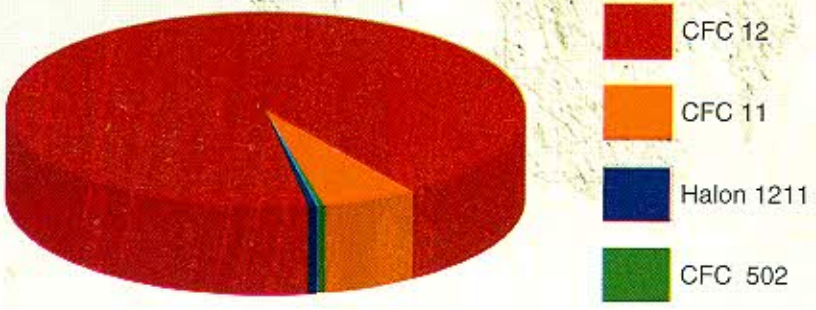


Table 4.1 a: Percentage Distribution of ODS Imports

ODS	1991	1992	1993	1994	1995	1996	1997	1998
CFC 11	39	38	31	41	34	24	23	6
CFC12	55	40	59	51	57	70	74	93
CFC113	4	4	1	1	2	1	0	0
CFC 115	0	0	0	0	0	0	0	0
CFC 502	1	1	1	1	1	1	0	0
Halon 1211	0	1	0	1	1	1	2	1
Subtotal	100	84	94	94	95	97	100	100
CTC	0	3	1	3	3	2	0	0
TCA	0	13	5	3	2	1	0	0
Subtotal	0	16	6	6	5	3	0	0
Total	100	100	100	100	100	100	100	100

Table 4.1 b: Percentage Change

ODS	1992	1993	1994	1995	1996	1997	1998
CFC 11	58	-38	73	-28	-38	-19	-1
CFC12	20	10	12	-2	5	-9	.02
CFC113	72	-77	2	43	-53	-100	0
CFC 115	-100		-86	200	-100	**0**	0
CFC 502	1	1	1	1	1	**0**	0
Halon 1211		-84	243	42	15	8	.5
Subtotal	38	-17	32	-13	-12	-12	-0.48
CTC		-67	205	-17	-41	-100	0
TCA		-72	-23	-33	-51	-100	0
Subtotal		-71	24	-25	-45	-100	0
Total	63	-25	31	-13	-13	-15	-0.48

B. ODS Consumption

The paucity of data on consumption by sector makes it difficult to extend the analysis up to 1997. To address this data problem, estimates were made on the basis of past consumption and importation trends and assumed growth rates. In the absence of a complete data set on consumption by sector, ODS importation was used as proxy as there are no domestic producers of ODSs. Comparing the available consumption data with importation data, it is observed that the two are almost equal. This allows the use of import data in estimating remaining demand which will not be covered by phaseout projects.

A World Bank study estimated the consumption of ODSs by industry for 1991 and 1995 (including some intervening years) Comparing the estimated consumption with importation data from EMB and NSO (National Statistics Office), no large discrepancies were found except for the case of TCA (trichloroethane). Total ODS imports in 1997 amounted to 2,686 MT while the total ODS to be eliminated by phaseout projects was estimated at 1,640 MT. This leaves about 1,046 MT of remaining ODS demand which can be attributed mainly to CFC 12 consumption in the Mobile Airconditioners (MACs) and Refrigeration sectors.

1. CFC 11

CFC 11 is used in the following industries: refrigeration (household and commercial), air conditioning and other stationary services, foams (building insulation, flexible, and rigid), and tobacco expansion.

Total of CFC 11 consumption and importation are roughly the same: 1,275 MT for the former and 1,244 MT for the latter.

There is a 100% shift to non-ODS due to phaseout projects in household manufacturing, building insulation, flexible foam, and tobacco expansion and partial shift for commercial manufacturing and rigid foam

There are no phaseout projects for other stationary services.

1.1 Household Refrigeration Manufacturing

In the refrigeration-household manufacturing sector, CFC 11 is used as an insulation foam for refrigerators and freezers. Table 5 shows that the consumption of this sector dropped from 285 MT in 1991 to 194 MT in 1995. Estimated consumption, however, showed that this increased to 237 MT in 1997.

The five major companies in the refrigeration-household manufacturing sector, namely Philacor, Concepcion, MEPCO, Sanyo, and Transunion, have received technical and financial assistance from the Multilateral Fund. The phaseout projects implemented by these firms are expected to eliminate 486.8 MT of CFC 11.

The decline in the consumption of CFC 11 can be explained by the sector's shift to non-ozone depleting substances. All firms have already completed their conversion of blowing agents used in refrigerator insulating, except for Concepcion Industries which adopted cyclopentane. MEPCO, Philacor, Transunion, and Sanyo have eliminated their consumption of CFC 11 through their conversion to HCFC 141b.

... remaining ODS demand can be attributed mainly to CFC 12 consumption in the MACs and refrigeration sectors.

It is in these sectors where there exists a large gap between current demand and ODS eliminated by on-going phaseout projects.

Table 5: CFC 11 Importation and Consumption by Sector

CFC 11	1991	1994	1995	1996	1997	CFC 12 to be eliminated by phaseout projects	Remaining demand which is not addressed by phaseout projects	Firms carrying out phaseout projects
CFC 11 Importation	1,022	1,727	1,244	789	629	1,280.72		
Estimated Consumption			1,275		933			
REFRIGERATION								
Household Manufacturing	285	-	194		219	486.84		Philacor, Concepcion, Transunion, MEPCO, Sanyo
Commercial Manufacturing	-	98	106		138	69.78		Gomeco, Chee Puck, Well Built, Azkon, Unimagna
AIR CONDITIONING								
Other Stationary Services		296	326				326.00	None in recovery/ recycling
FOAM								
Building insulation and other foam application	-	60	66			90.00		Metal Forming, MBA Urethane, PU Rigid Insulation
Flexible foam	25	390	140			297.00		Dai-chi, Durafoam, Lastex, Golden Portals, Everfoam, Megafoam, Foamtech,Mandaue, Soutech, Foamcraft, RGC Foam
Rigid foam	90	63	93			37.10	55.90	Nikon and Himalaya Ashlar, Alen, Zegal Plastics
TOBACCO EXPANSION	350	-	380		250	300.00		Fortune

** This is expected to decline once firms complete their phaseout projects. Based on industry sources 10-20% of total consumption would remain.

Table 6: CFC 12 Importation and Consumption by Sector

CFC 12	1991	1994	1995	1996	1997	CFC 12 to be elimated by phaseoout projects	Remaining demand which is not addressed by phaseout projects	Firms carrying out phaseout projects
CFC 12 Importation	1,450	2,133	2,095	2,225	2,001			
Estimated Consumption	1,047	1,974	1,736		1,736			
REFRIGERATION								
Household Manufacturing	70	-	107		97	46.74	*	Umbrella: Concepcion, Sanyo and Transunion (also includes service) MEPCO
Household Service	65	-	360		73	60	13	National Recovery and Recycling Scheme
Commercial Manufacturing	95	18	23		26	8.99		Gomeco, Chee Puck, Well Bilt
Commercial Service	95	360	260		299			
AIR CONDITIONING								
MACs Manufacturing	50	255	210		34			Voluntary shift by firms
MACs Service	650	785	905		1146	6-11	1135	Metro Manila MACs Recycling Scheme
Other Stationary Services		-	55		61			
AEROSOLS	5	40	39					Some voluntary shift by firms
FOAM								
Packaging (XPS)	17	12	15			49		Q.C. Styro, AMTES, Concept, Syrotech

* 100 percent firm coverage
** This is expected to decline once firms complete their phaseout projects. Based on industry sources 10-20% of total consumption remain.

Table 7: Importation of other ODS by Sector

CFC 113	1991	1994	1995	1997	ODS to be eliminated by phaseout projects	Remaining demand which is not addressed by phaseout projects	Firms carrying out phaseout projects
CFC 113 Imports	112.0	46.0	66.0	0.0	151.12		
/In ODP MT/	89.6	36.8	52.8				
Estimated Consumption	202.4		67.6				
/In ODP MT/	161.9		54.1				
SOLVENTS							
Electronics, in MT	253		26.0		97.52		Integrated, Ionics,
In ODP MT	202.4		20.8				Electronic Assemblies
Metal Cleaning/Chemical	50.0	26		53.60			Amine , Clearfield, Ortho
Compounding, in MT							Scientific, Strongbase
/In ODP MT/		20.8	20.8				
TCA							
TCA Imports, in MT a/	0	120	80	0	7.30		
/In ODP MT/	0	12	8				
Estimated Consumption			795				
SOLVENTS							
Electronics, in MT			40		7.30		Ionics
/In ODP MT/			4				Ariad, Cloisonne,
					18.4		Redisol, Rodler
Metal Cleaning/Chemical	1459	945	600				
Compounding, in MT							
/In ODP MT/	145.9	94.5	60				
Aerosols, in MT	255	155					
/In ODP MT/		15.5	15.5				
CTC							
CTC Imports, in MT a/	0	122	101	0			None
/In ODP MT/	0	134.2	111.1				
Estimated Consumption	100	80	88				
SOLVENTS							
Other Uses, in MT	100	80	88				
/In ODP MT/	110	88	96.8				
Halon							
Halon 1211, in MT a/	0	24	34	42	25.00	17.0	Excelta Trading
/In ODP MT/	0	72	102	126			
Halon 1301, in MT	2		0				
/In ODP MT/	20						
Methyl Bromide							
/In ODP MT/					34.00		

(100% firm coverage)
note: a/ based on EMB data

1.2 Flexible Foam

Flexible foam manufacturing is another sector which has experienced a decline in its CFC 11 consumption. CFC 11 consumption by flexible foam manufacturing sector dropped from 390 MT in 1994 to 140 MT in 1995. This reduction in CFC 11 consumption can be attributed to the shift to methylene chloride, an alternative foaming agent. Nearly all firms in the sector have received financial grants from the Multilateral Fund for their phaseout projects. Foamcraft is expected to phase out 90 MT of CFC 11 with the completion of its system installation and building construction project. Mandaue Foam eliminated 80 MT of CFC 11 with the installation of a new equipment using methylene chloride. There are other SMEs that are participating in a technical assistance project to eliminate CFCs in the flexible foam manufacturing sector by shifting to methylene chloride. With the effective implementation of phaseout projects, future demand by this sector is expected to be zero. The phaseout projects are expected to eliminate 297 MT of CFC 11. This is enough to eliminate CFC 11 consumption by identified firms in the flexible foam sector.

1.3 Rigid Foam Manufacturing, Building Insulation and Other Foam Application

In the rigid foam manufacturing and building insulation and other foam application sectors, the consumption of CFC 11 has increased as the phaseout projects of most enterprises in these sectors have not yet been completed. CFC 11 consumption in the rigid foam manufacturing sector went up from 63 MT in 1994 to 93 MT in 1995. CFCs used in building installation and other foam applications rose slightly from 60 to 66 MT from 1995 to 1996.

Two rigid foam manufacturers, Nikon and Himalaya, have already completed their CFC 11 phaseout projects. These firms shifted to HCFC 141b and will shift to a full water-based technology in the near future. There is an on-going project to eliminate the usage of CFC 11 of small manufacturers of rigid polyurethane foam. These phaseout projects are expected to eliminate 37 MT of CFC 11 in the rigid foam manufacturing sector. There appears to be a shortfall of about 56 MT as consumption by the sector in 1995 amounted to 93 MT of CFC 11.

In the building insulation sector, Metal Forming, MBA Urethane, and PU Rigid are undertaking phaseout projects which will reduce CFC 11 consumption in the sector by 90 MT. These firms will convert to an all water-blown system with HCFC 141b as a transitory substance. This would be sufficient to eliminate CFC 11 consumption by the building insulation sector.

1.4 Tobacco Expansion

Table 5 reveals that in 1991, CFC 11 consumption in the tobacco expansion sector increased from 350 MT in 1991 to 380 MT in 1995. This dropped to approximately 250 MT in 1997. Fortune Tobacco, the only company that uses CFC 11 in the tobacco industry, is a recipient of technical and financial assistance from the Multilateral Fund and its consumption of CFC 11 is expected to be phased out once its conversion plans are realized in 1998. The project will allow the 100 percent conversion of Fortune Tobacco from using CFC 11 to carbon dioxide. There is no net atmospheric addition of CO_2 in the fluffing process because Fortune Tobacco gets its supply from by-products of distillation companies.

1.5 Commercial Refrigeration

In the commercial refrigeration manufacturing sector, the consumption of CFC 11 also increased from 98 MT in 1994 to 106 MT in 1995. One firm, Unimagna, a manufacturer of commercial refrigerators, has completed its phaseout project. Three other firms in the sector, namely Gomeco, Chee Puck, and Well Bilt are carrying out their CFC phaseout plans under an umbrella project implemented by the UNDP. Another firm, Azckon Refrigeration is also undertaking a project to eliminate CFC 11. About 70 MT of CFC 11 is expected to be phased out as a result of these projects. While the 1995 consumption of 106 MT is still on the high side, this is expected to decline as firms in the industry complete their phaseout projects.

1.6 Air Conditioning and Other Stationary Sources

HCFC 22 is used for package, split-type, screw type, and central airconditioning systems. Centrifugal central type airconditioning systems use CFC 11.

Based on industry sources, centrifugal chillers comprise about 65% of the total while screw type chillers account for the remaining 35%.

There is very little domestic manufacturing of central type air conditioners. These units are mostly imported. The stationary airconditioning sector is dominated by Trane with its share of about 40-50 % of the market. This is followed by McQuay with the market share of about 20 % and York with a slightly less percentage share of the market. The remaining 10% is shared by Koppel, Carrier (under Concepcion industries) and Alen International. Carrier and Alen International are the domestic manufacturers of this type of equipment.

Trane and McQuay are no longer selling CFC-based equipment. In 1992, Trane shifted to HCFC 123. McQuay has used HFC 134a since 1994. York is still selling CFC-based equipment. Since 1992, Trane has recovery and recycling equipment which it uses for servicing old chillers equipped with CFC 11.

Table 5 shows that CFC 11 consumption of the air conditioning and other stationary services more than doubled from 110 MT in 1989 to 296 MT in 1995.

2. CFC 12

CFC 12 is the main cooling agent employed in refrigeration and air conditioning systems. It is used in refrigeration (household and commercial), air conditioning (MACs and other stationary services), aerosols, and packaging foams.

In 1995 CFC 12 importation of 2,095 MT more or less coincided with the total estimated CFC 12 consumption of 1,974 MT. (see Table 6).

The consumption by the refrigeration and air conditioning sectors has increased from 1991 to 1995, particularly for servicing household refrigerators and MACs.

The phaseout projects in household and commercial air conditioner manufacturing and in household and MACs service are not enough to cover existing demand in these sectors. There is a wide gap between CFC 12 to be eliminated by phaseout projects and existing demand in MACs and household refrigeration service. There are no phaseout projects for commercial service and other stationary services.

There are voluntary shifts in the MACs manufacturing and aerosols sectors.

2.1 Household Refrigeration Manufacturing

Due to a rise in demand for household refrigerators, there was an increase of CFC 12 consumption in the domestic refrigeration sector from 1991 to 1995. During this period, CFC 12 consumption rose from 70 MT to 107 MT. Nevertheless, the trend in the consumption of CFC 12 is expected to go in the opposite direction as soon as all the domestic manufacturers of refrigerators are able to complete their phaseout plans. PHILACOR, Concepcion Industries, Inc., MEPCO, SANYO Philippines, Inc., and Transunion Corporation are recipients of financial assistance from the Multilateral Fund. These grants will go a long way in phasing out the usage of CFCs 11 and 12 in these companies. An umbrella project to help these firms shift from CFC 12 to HCF 134a is expected to eliminate around 29.3 MT of the substance.

2.2 Household Refrigeration Servicing

The CFC 12 consumption by the household refrigeration servicing sector rose dramatically from 65 MT in 1991 to 360 MT in 1995. All five refrigerator firms have developed their ODS phaseout projects to include the recovery and recycling of CFC 12 provided by their service centers. However, aside from the service centers of these major manufacturers, there exist many small, informal enterprises engaged in servicing refrigerators. Major CFC users and service companies will be given recovery and recycling equipment. Training sessions with technicians will be held in order to improve service and maintenance practices and to increase their knowledge about the newest CFC and HFC charging and handling procedures. At the end of the project, 60 MT of CFC 12 is expected to be phased out. However, this may not be enough to cover existing demand by the sector.

2.3 Commercial Manufacturing & Service

The manufactured refrigerating equipment include walk-in freezers, reach-in freezers, display cabinets, beverage coolers, chillers, and refrigerators. The sector supplies the refrigerating equipment of food chains, restaurants, hospitals, supermarkets, bake shops, hotels, cafeterias, other similar establishments and factories engaged in food processing. The number of newly-registered restaurants grew by about 14% during 1996 and 1997.

The manufacturers do not have an association to represent them. Because of this, it is difficult to estimate the total production of the sector and, consequently, to determine the stock and demand for servicing. There are around five to six major firms in the industry namely, Middle B, Gomeco, Chee Puck, Allied, Food Tech, and Well Bilt. These firms manufacture not only commercial refrigerators and freezers, but other commercial and industrial kitchen equipment. There are many small backyard manufacturers in the sector. It is estimated that about twenty firms contribute less than 1 % of the total CFC consumption. These firms do not operate continuously, i.e. they stop operating for some time and then resurface with another name.

Unimagna and Azckon Refrigeration Industry received assistance from the Multilateral Fund through the UNDP for their CFC phaseout projects.

The UNDP implemented an umbrella project to phase out CFC consumption in the sector. Many firms were identified for the possible participation in the umbrella project; only three firms in the sector opted not to participate as they did not want to divulge information about their operations. Industry

sources believe that their firms would not have any option to shift to ODSs once CFCs are banned. Still, for as long as CFC-based compressors are readily available, they will continue manufacturing CFC-using commercial refrigerators and freezers.

Commercial refrigeration equipment manufacturers have service centers and accredited repair shops. But there are also other establishments that service old refrigeration equipment.

The consumption of CFC 12 by the commercial refrigeration manufacturing sector declined from 95 MT in 1991 to 23 MT in 1995. There are phaseout projects to eliminate the sector's CFC 12 consumption in the manufacturing process. In the commercial service sector, consumption rose from 95 MT in 1991 to 260 MT in 1995 and 299 MT in 1997. No phaseout projects under the Multilateral Fund have been identified for the service sector.

2.4 Mobile Air Conditioning (MACs)

The Philippines does not manufacture MAC components. It imports these components for assembly and installation in new cars. Due to the absence of local production and the dependence of the industry on imported MACs, there are no phaseout projects identified for financial assistance through the Multilateral Fund. Some firms have shifted to non-ODS technology voluntarily.

CFC 12 consumption in this sector decreased because of the international trend of shifting away from the use of the substance in MACs. Total consumption declined from 255 MT in 1994 to 210 MT in 1995 because of the voluntary shift of some firms to HFC 134a.

The passenger car assembly industry is aware of the 1998 ban on the use of CFC 12 for new MACs. Toyota, Mitsubishi, Honda, and Nissan, the four assemblers that have a combined market share of 82% in 1995, have already shifted to HFC 134a. Honda and Toyota completed their phaseout in 1995. Toyota installed recycling equipment to recover R-12 used in cars it assembled in the past. Honda, on the other hand, acquired retrofit equipment. Nissan intends to complete its phaseout plan soon. Currently, about 20% of the total cars it assembles still use R-12. The car manufacturers are concerned about the high cost of the HFC 134a. The substance is three to five times more expensive than CFC 12. The price is expected to decrease as demand for HFC 134a increases. Due to the large price differential, one problem that must be addressed is the practice of shifting back from HFC 134a to CFC 12. This occurs particularly among buses and AUVs.

2.5 Mobile Air Conditioning Service

The CFC 12 consumption by the MACs servicing sector increased from 650 MT in 1991 to 905 MT in 1995. A demonstration project in CFC 12 recovery and recycling is being implemented in Metro Manila. Thirty (30) units of recovery and recycling equipment were distributed among MACs service shops. The project, which is being coordinated by the USEPA and the UNDP, is expected to reduce between 6 to 11 MT of CFC 12 consumption. This amount appears to be small, relative to the demand by the sector.

2.6 Other Stationary Services[5]

There are no phaseout projects under the Multilateral Fund for other stationary services. Building developers/contractors tried to adopt retrofitting programs. But since retrofitting lowered the capacity of the equipment by 10 %, these firms opted not to continue with the programs. The developers did not engage in recovery and recycling activities either because of the high cost involved.

2.7 Aerosols

The consumption of CFCs in the aerosols sector decreased significantly. CFC 12 consumption was estimated at 40 MT in 1994 and remained roughly at the same level in 1995. Some aerosol firms have voluntarily phased out CFC 12 in their operations. Most industrial CFC-based aerosols have available alternatives. The following are potential CFC substitutes for aerosol propellants:

- compressed gases (air, nitrogen, and carbon dioxide)
- dissolved gases (carbon dioxide and nitrous oxide dissolved in a suitable solvent such as ethanol)
- other liquified gases (dimethyl ether)
- hydrochlorofluorocarbons (HCFC 22)

HCFCs, however, are not long-term alternatives. The 1992 Amendment to the Montreal Protocol seek to limit the use of HCFCs, provided that more environmentally-sound alternative exist.

For metered dose inhalers (medical inhalers that cannot yet be replaced with alternative propellants), dry powder inhalation systems provide an alternative to some but not to all asthma patients. Newer technology alternative delivery systems need to be developed for metered dose inhalers with non-ODS propellant.

2.8 Packaging Foams

In the foams (extruded polystyrene or XPS) sector, the consumption of CFC 12 has decreased from 17 MT in 1991 to 15 MT in 1995. Most of the large manufacturers of XPS foams have already shifted to liquid petroleum gas or butane alternatives. Of the remaining firms using CFC 12, Q.C. Styropackaging, AMTES, Concept, and Styrotech have completed their projects to eliminate CFC 12 in their manufacturing process. Under these phaseout projects, XPS foam sheet firms eliminated the use of CFC 12 in their manufacturing process by converting to butane. These phaseout projects are expected to reduce their CFC consumption by 49 MT.

[5] The Philippines does not manufacture this equipment. The major suppliers have already phased out both CFC 11 and CFC 12 .

3. CFC 113

CFC 113 is used as a solvent in electronic assembly, precision cleaning, general metal degreasing and in other industrial areas.

Total CFC 113 importation and estimated consumption are roughly the same with 66 MT and 67.6 MT, respectively registered in 1995 (see Table 7).

The phaseout projects carried out in the sector are enough to cover the demand for CFC 113.

The electronics industry has been relatively fast in phasing out ODSs. It currently uses water-based solutions in place of CFC solvents. Most of the electronics firms that received technical and financial assistance from the Multilateral Fund have already completed their phaseout projects. The projects in Ionics, Electronic Assemblies, and Integrated Microelectronics are still ongoing. The shift in this sector has been relatively fast due to the presence of a large number of multinational companies which voluntarily phased out their ODS use and the pressure from foreign export markets for firms to comply with international standards.

4. TCA

TCA is used as a solvent, a spray-coating thinner*. It also forms the active ingredient or solvent in the propelled liquid of many aerosols.

The phaseout projects in the electronics sector are enough to cover the demand in this sector. There is a gap between the TCA to be eliminated and the demand for the substance in metal cleaning/chemical compounding and in the aerosol sector.

Table 7 shows that TCA consumption by metal cleaning/chemical compounding sectors dropped from 1459 MT in 1991 to 600 MT in 1995. For aerosols, TCA consumption also decreased from 255 MT in 1994 to 155 MT in 1995.

The UNDP implemented an umbrella project to eliminate the consumption of CFC 113 and TCA in small enterprises by adopting non-ODS blend formulations. This project involved Amine, Clearfield, Ortho, Scientific, and Strongbase. The project phased out 53.6 MT of both CFC 113 and TCA.

5. CTC

- CTC is used as a cleaning solvent and as the basic building block in the production of other CFCs. However, CTC has been found to be carcinogenic and is no longer used in most countries.

- There are no projects that have been identified for the phaseout of this substance.

- Total CTC consumption and importation are about the same in 1995 (see Table 7).

Table 7 shows that CTC consumption by the solvents sector declined from 100 MT in 1991 to 88 MT in 1995. CTC imports declined by 41 percent in 1996, with no importation posted in 1997.

Bureau of Customs data showed a small quantity of CTC imports amounting to about 1.3 MT in 1997. This indicates the need for strict enforcement of the import ban on CTC, an issue being addressed by the DENR/BOC

* In the Phillipines, TCA is not widely used as thinner. A survey among paint and thinner manufacturers in the country revealed that this substance was not used/applied in any of their products.

ODS Institutional Strengthening Project. Note that the Fertilizer and Pesticides Authority (FPA) regulates this substance as it is used as soil fumigant.

6. Halon 1211 and 1301

Halon 1211 and 1301 are used as fire extinguishing agents. Halon 1211 is employed in portable fire extinguishers while Halon 1301 is used in total flood fixed systems. Both Halon 1211 and 1301 were scheduled for phaseout in 1998.

A project was completed for the recovery and banking of Halon 1211. It is expected to phase out 25 MT of Halon 1211.

Table 7 shows that the consumption of Halon 1301 was barely 2 MT in 1991 and was completely eliminated in 1995. Traders of this substance confirmed that the import price of Halon 1301 has increased, indicating scarcity in the international market. With the price increases, shifts towards less costly alternatives have taken place. There is still no "drop-in" alternative available for this substance. In the Philippines, less expensive alternatives such as dry chemical, water and FM200* are being used.

Halon 1211 consumption increased gradually from 34 MT in 1995 to 39 MT in 1996 and to 42 MT in 1997. This indicates increases in consumption by 42 percent in 1995, 15 percent in 1996 and by eight percent in 1997. The demand for the substance is expected to remain at a relatively high level.

The increase in the prices of halons has prompted some suppliers to voluntarily adopt recovery and recycling of halons.

* Proprietary chemical of Elf-Atochem

C. Future Demand Estimates

CFCs 11 and 12 are the major ozone depleting substances that the country uses. The consumption of CFC 11 and 12 comes mainly from the refrigeration and MACs sectors. Thus, future demand estimates would focus on the projected demand for CFCs 11 and 12 in the MACs manufacturing and service as well as in the household refrigeration manufacturing and service sectors. These demand estimates are based on manufacturing data and calculations on the level of stock of ODS-using equipment. The projections are also extended to include the commercial and industrial manufacturing and service sectors as well as the other stationary services sector.

Future work should include research on refrigerated trucks and fishing vessells to look into the CFC consumption of these sectors.

1. Assumptions Used in Estimating Future Demands

- Zero growth for 1997 and 1998 due to the economic slowdown arising from the Asian financial crisis
- 10 % sales growth starting in 1999
- Adjustments in stock to reflect the shift to non-ODS by the MACs and refrigeration industries

1.1 MACs Manufacturing

To estimate the total number of new MACs for the years 1996 and 1997 and the demand for CFC 12 in MACs manufacturing, data on the total number of motor vehicles sold was used.

1.2 MACs Service

To derive the demand for CFC 12 in MACs service, data on a number of motor vehicles registered from 1980 to 1987 was used. The stock of vehicles was calculated in order to estimate the total number of MACs that must be served.

- MACs have a lifetime of approximately twelve (12) years.
- A ban on new MACs equipped with ODS would be imposed in 1998.
- Vehicles equipped with MACs using HFC 134a would not shift back to CFC.

It was also assumed that a ban on new MACs equipped with ODSs would be imposed in 1998 and that vechicles equipped with MACs using HFC 134a do not shift back to CFC 12.

1.3 Refrigeration Service

- The appliance is serviced twice over its lifetime of 15 years.

1.4 Commercial Refrigeration

- For manufacturing, large firms would have zero CFC consumption as their phaseout projects would be completed by 1998. About 10 - 20% of CFC consumption would remain arising from SMEs.

- The consumption by the commercial refrigeration manufacturing sector would follow the growth of the Gross National Product (GNP) from 1996 and 1997. A zero growth is assumed in 1998 as a result of the Asian crisis.

- For servicing in the commercial refrigeration sector, demand would follow the growth of the gross national product from 1996 to 1998 and the growth in the household refrigeration service sector from 1999 to 2010.

1.5 Other Stationary Services

Demand would grow by 10% in 1996, following growth of most Philippine industries.

- Zero growth in 1997 to 1999 because of the financial crisis
- A 10% linear decline in demand from 2000 to 2009.

Appendix VI contains a more detailed description of the procedure and assumptions used

Table 8: Derived Demand for CFC 12

MACs Manufacturing				
Year	Estimated No. of New Vehicles Assembled Locally	Estimated No. of New Vehicles with MACs	Estimated No. of MACs equipped with ODS	Derived Demand for CFC 12 (in MT)
1995	129,325	105,258	105,258	138
1996	137,365	116,985	58,492	79
1997	139,410	123,936	24,787	34
1998	139,410	123,936	0	0

MACs Service		
With 1998 Ban on CFC 12 for New MACs		
Year	Estimated No. of Vehicles that Need Servicing	Derived Demand for CFC 12 (in MT)
1996	670,063	1,037
1997	745,614	1,146
1998	771,333	1,188
1999	758,664	1,169
2000	738,963	1,137
2001	709,807	1,091
2002	659,574	1,015
2003	589,887	908
2004	592,335	811
2005	454,620	691
2006	370,211	559
2007	272,775	407
2008	129,142	191
2009	36,898	58
2010	0.0	0

Table 9: Estimated Consumption of CFC 11, CFC 12, and HCFC 22 in the Domestic Household Sector (in MT)

	Refrigerators and Freezers			Room A/Cs	
	New Production		Servicing	New Production	Servicing
Year	CFC 12	CFC 11	CFC 12	HCFC 22	HCFC 22
1995	98	220	90	111	71
1996	117	263	95	154	72
1997	97	219	73	201	67
1998	0	0	102	201	89
1999			122	221	111
2000			144	243	151
2001			181	267	187
2002			169	294	240
2003			158	323	296
2004			68	355	311
2005			78	391	368
2006			105	430	424
2007			118	473	518
2008			98	520	597
2009			0	572	633
2010			0	630	696

For new manufacturing, CFC 12 consumption is expected to decline starting 1996 as more vehicle assemblers shift to CFC alternatives.

For MACs services, demand will start to decrease in 1999.

D. Demand Projections

1. MACs

In new manufacturing, CFC 12 consumption by sector declined in 1996 as more vehicle assemblers shifted to CFC alternatives. Estimates show demand for CFC 12 declining from 138 MT in 1995 to 79 MT in 1996 (see Table 8). This dropped to 34 MT in 1997 and further to a minimum in 1998.

In MACs services, demand increased up to 1998 and started to fall thereafter. Estimates show CFC 12 demand from the MACs services sector increased from 1,037 MT in 1996 to 1,188 MT in 1998. This will gradually drop from 1,169 MT in 1999 to 1,015 MT in 2002 and to 691 MT in 2005 and become to zero in 2010. This assumes, however, that owners of new non-ODS MACs will not shift back to CFC 12. Furthermore, importation of MACs using ODS will not be allowed. These assumptions have important implications on the key tasks of the government.

As the demand for refrigerators is likely to grow, there is a need to immediately ban the importation of CFCs 11 and 12 for household refrigeration manufacturing. If this measure is not adopted, the demand for CFC 12 to be used for refrigeration service will likewise increase in the future.

2. Household Refrigeration

The estimates on consumption for the household refrigeration manufacturing sector are 117 MT of CFC 12 and 263 MT of CFC 11 for 1996 (see Table 9). As some domestic firms completed their phaseout projects and started shifting to CFC alternatives, demand declined in 1997 to 97 MT of CFC 12 and 219 MT of CFC 11. As the demand for refrigerators is likely to grow, there is a need to ban the importation of CFC 11 and 12 for household refrigeration manufacturing in 1998.

The projected demand for CFC 12 by the household refrigeration service is 73 MT in 1997 and an accelerated phaseout of CFC 12 for servicing in 1997. This is expected to increase to 102 MT in 1998 and to 181 MT in 2001. In 2009, the demand for CFC 12 by the refrigeration service sector is expected to be zero.

As long as the importation of ODSs for the production of new equipment and importation of equipment using ODSs will be banned in 1999, the demand for ODSs to be used for servicing existing equipment will decline. As such, the earlier target dates set in the country's phaseout strategy, (2010) can be maintained.

3. Commercial and Industrial Refrigeration and Other Stationary Services

The demand for CFC 12 by the majority of firms in the commercial and industrial refrigeration manufacturing is expected to become minimal in 1999 as firms complete their phaseout projects. The firms which received financial assistance from the Multilateral Fund constitute about 80-90% of the market. Interviews with firms revealed that the remaining 10-20% are SMEs. Estimates show that about 6 MT will be used by the small and medium enterprises for 1998 and 1999 (refer to Table 10). Service in the commercial and industrial refrigeration sector was estimated to have reached 299 MT in 1997. This increased to 345 MT in 1998 up to 373 MT in 1999, and is expected to decline thereafter.

In 2010, demand is expected to be zero on the assumption that a CFC ban on manufacturing will be imposed in 1998.

For other stationary services, CFC 11 will remain at about 326 MT from 1997 to 1999 and will start declining in 2000 (see Table 10). The sector's yearly CFC 12 consumption will stay at 61 MT between 1997 and 1999 and will gradually decline thereafter.

E. Issues/Problem Areas

1. Small and Medium Enterprises (SMEs)

The Country Program has been unable to cover a significant portion of the SMEs, which are mainly in the service sector. These comprise a large part of remaining ODS users. It is important to shift the focus of the ODS phaseout efforts toward this sector which is more difficult to do. Many identification surveys, training, information and education campaign that are designed specifically to reach the sector will be required.

SMEs which are mainly in the service sector, comprise a large part of remaining ODS users. In 1994, the total number of establishments servicing MACs and refrigerators were estimated at around 2,068 and 280, respectively. Small establishments (those with less than 10 employees) comprised the bulk of these sectors. For MACs, there were around 1,941 establishments and for refrigerators, 265 establishments. The total employment for MACs was 7,183 workers and 872 workers for refrigerators.

Identifying the composition and magnitude of the SMEs would help government planners in addressing the needs of the sector for financial assistance in carrying out ODS phaseout projects. This sector has very little access to new information and available technologies. It is important for policy makers to target not only the well-organized domestic firms but this specific group as well. Unfortunately, the available data on SMEs appears to be insufficient. Undertaking a survey would be useful, but this would entail a high cost.

2. Huge remaining demand for CFCs until early 2000

As the projections showed, the demand for CFC 12 by the MACs and refrigeration service sectors would remain high until 1999 for MACs and 2001 for refrigeration (see Table 10). Phaseout projects in the MACS and refrigeration service sectors are not enough to address future demand. There is a large gap between projected demand and ODSs eliminated by on-going phaseout projects.

Small and medium size enterprises (SMEs), which are mainly in the service sector, comprise a large part of remaining ODS user.

Moreover, in estimating future demand for the MACs and refrigeration service sectors, it is assumed that an import ban on ODS-using equipment would be imposed in 1998 and existing non-ODS using equipment would not shift back to ODS. As these assumptions have an important bearing on the level of future demand, the policy recommendation to ban imports of ODS-using equipment should be addressed immediately. Delays in implementing this would imply delays in achieving our ODS phaseout targets.

3. MACs Service

The projected demand for CFC 12 by this sector is particularly large. It hit a high of 1,188 MT in 1998 and gradually declined thereafter. There are reports that buses and AUVs are converting back to CFC 12 because it is much cheaper. CFC-based compressors are also cheap and widely available. If the conversion back to ODS is a widespread practice, then CFC 12 phaseout in the sector may be delayed.

4. Halons

The government has targeted 1998 as the phaseout year for halons. The absence of "drop-in" alternatives for halon 1211 may, delay its phaseout particularly for essential uses such as in civil aviation and telecommunications sectors. There is a need to establish criteria on essential uses in order to have a clear definition on what these are. The stock of halon based fire extinguishers is considered by industry experts to be relatively high. There is an existing halon banking project, which if successfully implemented may be sufficient to meet existing demand. A serious problem, is the acceptability of the quality/ or the purity of the halon to be recovered. This implies the need for a destruction facility for the non-recyclable halon.

5. Institutional Concerns

The DENR, thru the Philippine Ozone Desk (POD) based at the EMB, is the lead agency responsible for formulating the policy framework for the implementation of the Montreal Protocol. However, to be able to sustainably carry out its crucial tasks in the ODS phase-out process, its status in the DENR bureaucracy and its funding requirements must be addressed. Efforts should be done to strengthen its staffing pattern. Institutional Strengthening would also be necessary in improving its import monitoring and import clearance procedures as well as its capability to manage quotas and undertake information and education campaigns.

Box: 2 Refrigeration and MACs Service Establishments

	Total	Small	Large
Refrigeration Service			
Number of Establishment	280	265	15
Number of Working Owners and Unpaid Workers	321	311	10
Paid Employees	827	561	266
Total Revenue (P 000)	122,903	63,167	59,736
MACs Service			
Number of Establishments Number of Working Owners and Unpaid Workers	2,068 2,275	1,941 2,176	128 100
Paid Employees	7,217	5,007	2,210
Total Revenue ('P000)	862,427	443,546	418,881

Source of basic data: 1994 Census of Establishments, NSO

Investment Projects

The Mobile Air Conditioning (MACS) Recovery/Recycling Project will prevent venting of CFC 12 from compressors of cars into the atmosphere.

New CFC-Free Technology is used in tobacco expansion.

New foaming machines no longer use CFCs as blowing agents for production of rigid polyurethane foam as insulation for water jugs and coolers

Deionized water is used as an alternative technology to clean PCBs, computer drivers and other electronic chips.

Halon Recovery/Recycling Project aims to bank halon 1211 and halon 1301 for servicing. Beginning July 1999, no new fire extinguishers are allowed in the domestic market.

Non-investment Projects

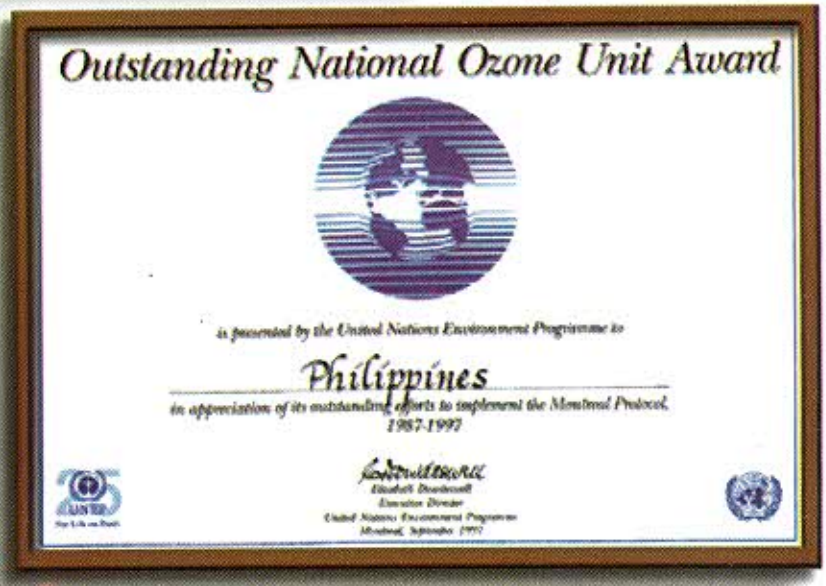
The "Forum on Alternative Non-ODS using Technologies and Recognition Day for Ozone Friendly Products" held at the PICC was one of major IEC activities of the DENR with support from UNEP, UNDP, World Bank and the Private Sector.

The DENR conducts regular Information Dissemination Campaigns nationwide through symposia and focused panel discussions called *Regional Kapihans*.

This oil-in-canvass piece entitled "The Destroyer" bagged the first prize in the 1998 Philippine national "Children's Painting Contest on the Protection of the Ozone Layer."

Training sessions are conducted with service technicians to enhance their capability in handling specialized CFC recycling and recovery equipment.

Youth Leaders participate in various activities in line with the DENR Ozone Layer Protection Information Dissemination Program.

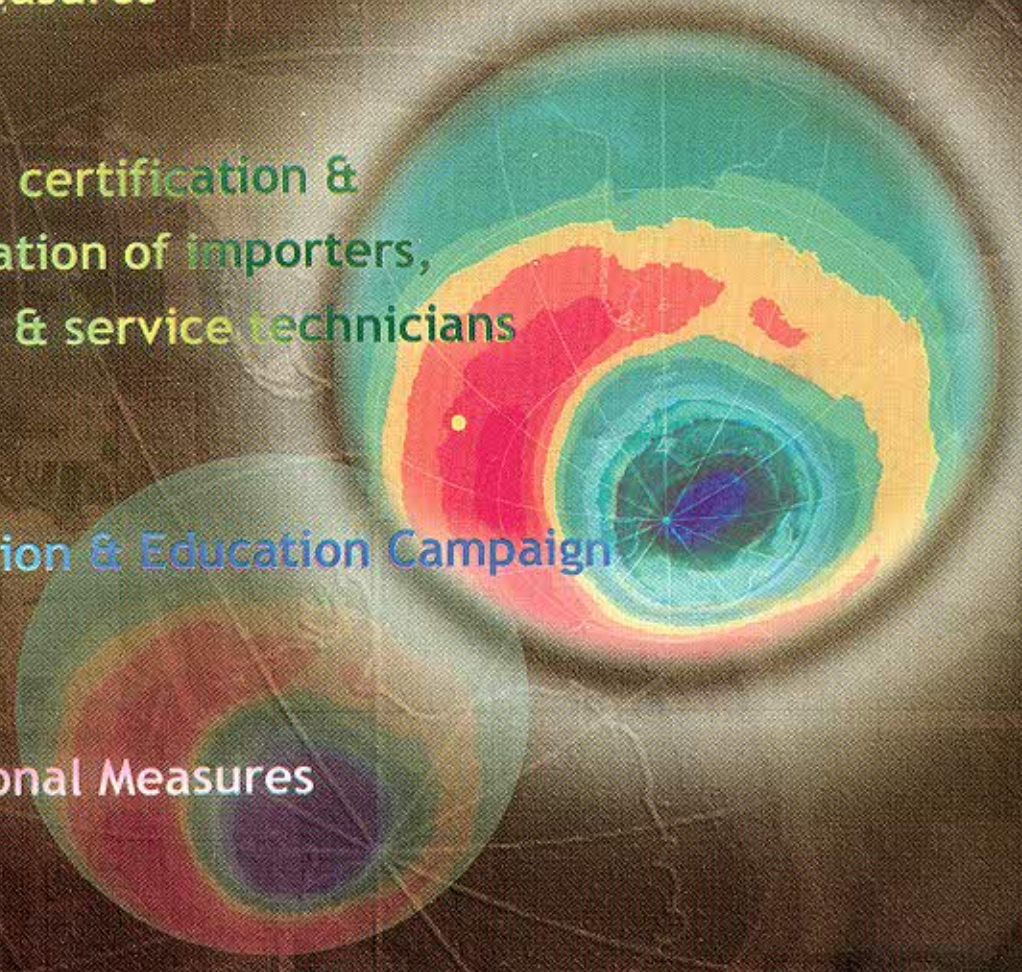


The Philippines received from UNEP one of its two major international awards in 1997 which was the Outstanding National Ozone Unit Award. Outstanding National Ozone Unit Award received by the Philippines during the 10th Anniversary of the Montreal Protocol held in Montreal, Canada on September 17, 1997.

Updated Philippine Country Program

Trade Measures

Training, certification & accreditation of importers, handlers & service technicians



Information & Education Campaign

Institutional Measures

Regular Review of the Country Program

Ratification of the Copenhagen Amendments

IV. Updated Country Program

A. Recommemded Phaseout Schedule

1. Where is the Philippines in terms of achieving targets?

Table 10 summarizes the demand projections up to year 2010. Table 11 presents the phaseout schedules under the Montreal Protocol and the 1993 Philippine Country Program and the projected demand on the scheduled phaseout year.

As Table 11 shows, the delay in achieving the 1996 target for TCA and CTC is only with respect to the Philippine Country Program schedule. The same is true for Halon 1211 where a possible delay is expected and exemption for essential uses is recommended. The latter also applies to Metered Dose Inhalers. For the remaining ODSs, consumption trends are well within the targets of the 1993 Philippine Country Program with some room for phase-out acceleration in others.

Based on these, three possible phaseout scenarios were considered for analysis: (see Table 12)

- Conservative scenario: the phaseout targets set in the 1993 Philippine Country Program with some minor adjustments for delays in TCA and CTC
- Mid-range scenario: acceleration by three years of the scheduled phaseout of ozone depleting substances
- Optimistic scenario: acceleration by six years of the scheduled phaseout of ozone depleting substances

Estimates were made to calculate the economic cost of the alternative scenarios. Acceleration by three and six years implies incurring of sunk costs as existing ODS-using equipment, which are not fully depreciated and are still useful, will have to be retired and replaced with non-ODS using equipment. Table 12 presents the three alternative scenarios together with the cost of accelerating the phaseout targets. The costs were adjusted to take into account productivity increases. Following previous studies undertaken by the Philippine Institute for Development Studies (PIDS), a productivity growth rate of three percent per year is assumed. The estimated costs valued at 1998 prices are adjusted downward by this factor on the assumption that equipment of newer models embody higher productivity or efficiency. Accelerating by six years would entail added cost ranging from P3.4 billion to P5.1 billion. On the other hand, accelerating by three years implies an added cost between P0.2 billion to P0.9 billion. The range is based on different assumptions on the average life of the equipment, i.e., 10 years; while the upper bound estimates are based on a longer average life for the equipment, i.e., 12 years.

Consumption trends are well within the targets of the 1993 Philippine Country Program .

Table 10: DISTRIBUTION OF BASELINE CONSUMPTION OF ODS PER TYPE, 1995-1997 (BY SECTOR) AND DEMAND PROJECTIONS (1997-2010) (In Metric Tons)

Sector	ODP	1995	1996	1997	Three-year average (1995-1997)		1998 (auxiliary reference data)	Target ODP of all MF projects	ODP already phased out as CY 1998	Projected Consumption														
		EC/AI	EC/AI	EC/AI	EC/AI	EC/ODP	EC/AI			1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Refrigeration and Air Conditioning																								
CFC-11	1.00	104.83	56.78	39.23	66.95	66.95	12.34	5.48	0.00	933	354	354	293	264	237	214	192	173	156	140	126	114	0
CFC-12	1.00	2,092.52	2,197.04	1,998.66	2,096.07	2,096.07	1,985.41	175.08	115.92	1736	1702	1731	1661	1658	1509	1387	1131	1038	859	731	412	169	0
CFC-114	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFC-115	0.60	5.99	0.00	0.75	2.25	1.35	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFC-502*	0.34	27..65	18.85	12.67	9.72	6.71	0.00	1.82	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total		2,230.99	2,272.66	2,051.31	2,184.99	2,171.07	1,997.74	182.34	115.92	2669	2056	2085	1954	1922	1736	1601	1323	1211	1015	871	538	203	0
Solvents																								
CFC-113**	0.80	65.53	30.80	0.00	32.11	25.69	0.00	234.84	150.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,1,1 TCA**	0.10	76.70	36.93	0.00	39.54	3.95	0.00	951.50	176.30	169/c	0	0	0	0	0	0	0	0	0	0	0	0	0
CTC**	1.10	100.80	60.48	0.00	53.76	59.14	0.00	0.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total		246.03	130.21	0.00	125.41	88.78	0.00	1,186.34	326.37	170	0	0	0	0	0	0	0	0	0	0	0	0	0
Foams																								
CFC-11	1.00	671.72	440.10	361.92	491.25	491.25	65.48	899.48	815.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFC-12 (XPS)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total		671.72	440.10	361.92	491.25	491.25	65.48	899.48	815.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aerosols																								
CFC-11	1.00	19.60	19.60	19.60	19.60	19.60	19.60	2.40	2.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFC-12	1.00	2.40	2.40	2.40	2.40	2.40	2.40	5.40	14.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total		22.00	22.00	22.00	22.00	22.00	22.00	56.40	16.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tobacco Expansion																								
CFC-11	1.00	448.17	273.01	208.59	309.92	309.92	44.96	350.00	280.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total		448.17	273.01	208.59	309.92	309.92	44.96	350.00	280.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Halons***																								
H-1211	3.00	33.60	39.40	42.20	38.40	115.20	15.60	25.00	0.00	42/a	0/a	0	0	0	0	0	0	0	0	0	0	0	0
H-1301	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total		33.60	39.40	42.20	38.40	115.20	15.60	25.00	0.00	42	0	0	0	0	0	0	0	0	0	0	0	0	0
Total CFC-11		1,244.32	789.49	629.34	887.72	887.72	142.38	1,257.34	1,098.28	933	354	354	293	264	237	214	192	173	156	140	126	114	0
Total CFC-12		2,094.92	2,199.44	2,001.06	2,098.47	2,098.47	1,987.81	229.06	129.92	1736	1702	1731	1661	1658	1509	1387	1131	1038	859	731	412	169	0
Total Other CFCs (+ CFC-502)		99.17	49.64	13.42	54.08	33.74	0.00	236.66	150.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Halons		33.60	39.40	42.20	38.40	115.20	15.60	25.00	0.00	42	0	0	0	0	0	0	0	0	0	0	0	0	0
Total CTC		100.80	60.48	0.00	53.76	59.14	0.00	0.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total 1.1.1 TCA		79.70	38.93	0.00	39.54	3.95	0.00	951.50	176.30	169	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total		3,625.51	3,177.38	2,686.01	3,171.97	3,198..22	2,145.78	2,669.56	1,554.88	2881	2056	2085	1954	1922	1736	1601	1323	1211	1015	871	538	203	0

Calculation on sectoral consumption are largely based on the projected unconstrained (artificial interventions like required bans are not considered) growth rates provoded by NEDA for the different sectors.
Only biennial estimates were provided in the 1993 Country Program - i.e., 1993, 1995, 1997, so on and so forth. Years in between were based on mean average figures for immediately preceding and proceeding years.
Consumption in metric tons is based on import records only. CY 1998 data are included since they are complete and when most MF projects are fully implemented, hence, actual remaining phase-out targets are more realistic.
*** No segregated estimates were provided in 1993 Country Program, hence, per cent shares are lumped with CFC-115. CFC-115 in bulk is banned starting 1/1/1999. CFC-502, which is a blend of CFC-115 and HCFC 22 has yet to be phased out.**
**** CFC-113, TCA and CTC are banned starting 1/1/1997.**
***** Halon imports in bulk are banned starting 1/1/1999 by DENR-EMB. Domestic manufacturing of halon-type extinguishers are prohibited by Bereau of Products Standards starting 1 July 1999.**

Legend: * EC/AI: estimated consumption in total MT per sector based on actual EMB import records per substance; EC/ODP = estimated consumtion in weighted ODP in MT

2. Should the Phaseout Schedule Be Accelerated?

There are arguments for the acceleration of the ODS phaseout. The major benefit is the lower ozone depletion that would result. A direct benefit for the country would be the better preparedness (in case of future scarcity of ODS supply) for the accelerated shift to newer and better (cleaner and more environment- friendly) technology. Considering the level of development of the country, the arguments against acceleration appear to be more compelling. For one, more time for phaseout would mean possibly cheaper and more appropriate alternative substance and technology. The conservative scenario would allow both importers and end users to manage the shift on the basis of their technological capabilities. It would also provide more time for conducting training programs to service technicians and educating consumers on the value of shifting to non-ODS using products. The more important consideration, is the additional cost of acceleration which could run from one to five billion pesos arising from early retirement of equipment.

Thus, as far as regulatory approaches are concerned, the adoption of the conservative scenario (which means maintaining the present phaseout schedule) is recommended.

It is best also to adopt measures for accelerating the phaseout through voluntary shifts to newer and more "ozone-friendly" technologies.

This was validated in the series of consultations with major stockholders throughout the country. Under the conservative scenario, all ODS-using equipment would have been fully depreciated by year 2010. While some residual ODS demand would remain after 2010, this is expected to be minimal. It is best also to adopt measures for accelerating the phaseout through voluntary shifts to newer and more "ozone-friendly" technologies.

3. Suggestions for Updated Milestones and Phaseout Schedule

The consumption trends and demand projections suggest the following milestone and phaseout schedule (see box 3):

Box 3: Recommended Phaseout Schedule

CFC 11 Service	base year: 1996 25% reduction in importation by year 2001 50% reduction in importation by year 2005 80% reduction in importation by year 2008 100% reduction in importation by year 2010
CFC 12 Service	base year: 1996 25% reduction in importation by year 2001 50% reduction in importation by year 2005 80% reduction in importation by year 2008 100% reduction in imporation by year 2010
In both cases, importation for new manufacturing will not be allowed effective January 1999.	
CFC 113, 114,115	No recorded importation
Halon 1211	Zero importation achieved by January 1999
Halon 1301	Zero importation achieved by 1995
1,1,1 TCA	Zero Importation by January 1999

Table 11: Assessment of Current Phaseout Schedule

Substance/Sector	Phaseout Schedule		Projected Demand at Phaseout Year	Implication on the Phaseout Schedule
	Montreal Protocol London Amendment	1993 Philippine Country Program		
CFC 11	mid 1989: freeze mid 1995: 50% 1997: 85% 2000: 100%			
REFRIGERATION				
Household Mfg		1998	0	On Target
Commercial Mfg		1998	0	On Target
AIR CONDITIONING				
Other Stationary Services		2010	0	On Target
FOAM				
Building insulation & other foam uses		1998	0	On Target
Flexible foam		1998	0	On Target
Rigid foam		1998	0	On Target
TOBACCO EXPANSION		1998	0	On Target
CFC 12	mid 1989: freeze mid 1995: 50% 1997: 85% 2000: 100%			
REFRIGERATION				
Household Mfg		1998	0	On Target
Household Service		2010	0	Room for Acceleration
Commercial Mfg		1998	0	On Target
Comm'l Service		2010	0	On Target
AIR CONDITIONING				
MACs Mfg		1998	0	On Target
MACs Service		2010	0	Room for Acceleration
Other Stationary Services		2010	0	On Target
AEROSOLS		1998	0	On Target except for MDIs (Metered dose inhalers)
FOAM				
Packaging(XPS)		1998	0	On Target
CFC 113	mid 1989: freeze mid 1995: 50% 1997: 85% 2000: 100%	1996	0	Achieved
TCA	1993: freeze 1995: 30% 2000: 70% 2005: 100%	1996	169 MT in 1997	Delayed
CTC	1995: freeze	1996	1 MT in 1997	Delayed
Halon 1211 Halon 1301	1992: freeze 1995: 50%	1998	0	Possible Delay Exemptions for Essential Uses
Halon 1301	2000: 100%			

4. Key Shifts in Focus

There are significant shifts in focus after more than five years of implementing the Philippine Country Program. For one, the 1993 Philippine Country Program has targeted the larger manufacturing firms and has implemented phaseout projects. A key shift in focus should be from big investment projects to servicing and from big firms to SMEs and micro enterprises. Furthermore, much of the information and education campaign has been towards general awareness about ODSs and impact of ozone depletion. There is also a need to shift to more detailed information dissemination, e.g., on alternative substances and technology including access, price, advantages, etc.

These shifts in focus have implications on needed measures and on the roles of the different agencies/sectors.

5. Policy Measures to be implemented to Achieve Targets

A wide range of measures are recommended to achieve the targets of the conservative scenario. There is room for accelerating the phaseout of some ODS and for policy measures to advance the phaseout schedule. A Summary of Recommendations is presented in Table 13.

Underlying these measures is a two-pronged strategy which would:

- Increasingly discourage use of ODS
- Progressively encourage use of non-ODS

A key shift in focus should be from big investment projects to servicing and from big firms to SMEs and micro enterprises.

There is also a need to shift to more detailed information dissemination, e.g., on alternative substances and technology including access, price, advantages, etc.

Table 12: Accelerated Phaseout Schedules and Estimated Economic Costs

ODS	Phaseout Years		
	Conservative Scenario	Mid-range Scenario	Optimistic Scenario
CFC 11			
REFRIGERATION			
Manufacturing	1998	1998	1998
AIRCONDITIONING			
Other Stationary Services	2010	2007	2004
FOAM			
Building insulation & other foam uses	1998	1998	1998
Flexible	1998	1998	1998
Rigid foam	1998	1998	1998
TOBACCO EXPANSION	1998	1998	1998
CFC12			
REFRIGERATION			
Manufacturing	1998	1998	1998
Service	2010	2007	2004
AIR CONDITIONING			
Manufacturing	1998	1998	1998
Service	2010	2007	2004
AEROSOLS	1998	1998	1998
FOAM			
Packaging (XPS)	1998	1998	1998
CFC 113	1996	1996	1996
TCA	1998	1998	1998
GTC	1998	1998	1998
Halon 1211	1998	1998	1998
Economic Cost (in billion pesos)		Mid-range Scenario	Optimistic Scenario
Assumption 1		0.197	3.400
Assumption 2		0.897	5.058

B. Priority Measures

1. Trade Measures

1.a On Importation of ODS

1.1a Reduction of the allowable volume of imports cleared by DENR/EMB in a programmatic manner

Based on the recommended phaseout schedule (See Box 3), the importation of CFC 11 and CFC 12 for the service sector should be reduced by 25% of the 1996 importation level by 2001. By the year 2005, 50% reduction is required, and further reduction by 80% by 2008. One hundred percent reduction should be achieved by 2010.

1.1b Imposition of import ban on other ODS by scheduled phaseout

The use of trade measures is the major policy tool used in regulating the consumption of ODSs. Note, however, that the use of trade measures for environmental problems is considered a second best measure except in special cases like the global commons (under which the ozone layer problem falls). Set within a multilateral framework and complemented with domestic environmental regulation, trade measures seem to be effective in promoting environmental goals.

The reduction of an allowable volume of imports of CFC 11 and 12 based on projected demand and the effective implementation of import clearance mechanism which will strictly implement import reduction are the key elements in achieving the scheduled phaseout of ODSs.

As to the implementation requirements of these policy measures, the first two will be covered by the Chemical Control Order to be issued by the DENR. These measures will require greater involvement of different agencies and better coordination of their various roles and activities. The first two measures will involve the EMB, Bureau of Customs and the banking sector. The help of the Economic Intelligence and Investigation Bureau (EIIB) will be needed to help curb smuggling which could increasingly become a problem once significant reductions in import quotas are implemented.

The reduction of an allowable volume of imports of CFC 11 and 12 based on projected demand and the effective implementation of the import clearance mechanism which would strictly implement import reduction are key elements in achieving the scheduled phaseout of ODS.

1.2 On ODS-using equipment

1.2a Imposition of an import ban on ODS-using equipment

A clear policy should be set with respect to importation of ODS-using equipment. Two policy options are considered here. One is to ban importation of ODS-using equipment and the second is to simply impose an environmental charge on ODS-using equipment imports. The advantage of the first option is that it is more feasible for the government to implement. This is consistent with the policy of a future ban on ODSs in the final phaseout year. The advantages arising from the second option are the smoothening of adjustments and the contribution to the generation of government revenues.

1.2b Importation of a level of tax that is affordable to the industries but will discourage the demand for ODS-using equipment

The ban on the importation of ODS-using equipment requires proper definition and identification of the equipment to be covered by the ban as well as technical specifications on the life span of the equipment. The banning schedule could be differentiated according to the lifetime of the equipment. Those with longer lifetime would be banned earlier than those with shorter life spans. Note that having different stages of banning may be difficult to implement. This must be taken into consideration once the plan to implement an import ban on ODS-using equipment is formulated.

As to the implementation requirements of this measure, three channels are suggested:

1.2c Expediting the approval and implementation of the appropriate Chemical Control Order (CCO)

The inclusion of ODS-using equipment for import regulation could be channeled through the CCO. If this is legally feasible, the CCO is currently the best approach to implement the suggested ODS phaseout as both its basic organizational set-up and legal mandate are already in place. The EMB should, work for the approval and implementation of the Chemical Control Order that will regulate not only the importation of ODS but also the importation of machineries/equipment that use ODSs.

The ban on the importation of ODS-using equipment would require proper definition and identification of the equipment to be covered by the ban as well as technical specifications on the life span of the equipment.

1.3 Ensuring the inclusion of controls on ODS-using equipment under the implementing rules and regulations of the Clean Air Act.

Section 30 (Other Pollutants), Article II (Ozone-Depleting Substances) of the Clean Air Act stipulates that:

"Consistent with the Montreal Protocol and other international agreements and protocol to which the Philippines is a signatory, the Department shall phase-out ozone-depleting substances. Within 60 days after enactment of this Act, the Department shall publish a list of substances which are known to cause harmful effects to the ozone layer."

With this mandate, it would be more feasible for the DENR to include controls on ODS-using equipment in the implementing rules and regulations of the Act.

1.4 Preparation of a position paper for the consideration of the Committee on Trade and Related Matters (TRM), NEDA, an inter-agency committee which oversees trade policy implementation

This suggests a need for greater coordination among the EMB, BOC and the TRM.

2. Training, certification and accreditation of importers, handlers and service technicians

The ODS phaseout process could be facilitated by the accreditation of service shops and licensing of service technicians, direct handlers and ODS users. This needs a system in which only accredited importers are allowed to import these substances. This system also requires accredited importers to sell ODSs only to accredited shops and licensed technicians. This further requires accredited importers, wholesalers, dealers, retailers and licensed technicians to record their sales and consumption of these controlled substances and report these to the POD. The criteria for accreditation and licensing should include training of technicians and equipment requirements. With the establishment of an accreditation and licensing system, ODS consumption is expected to decline as technicians are trained in the proper handling of ODS and non-ODS and prevention of leakages and emissions.

At present, ODS importers are required by the POD to submit reports on their disposition of ODS imports. The information, provides only a listing of firms (which are a mixture of wholesalers/dealers, retailers, service shops, manufacturers and other users). The bulk of their customers consists of first level wholesalers and dealers. Reports suggest that there are more than three levels of sellers and dealers. The current monitoring system has no way of tracking how the sales of wholesalers and dealers are distributed among end - users.

Accredited importers, wholesalers, dealers, retailers and licensed technicians are required to record their sales and consumption of these controlled substances and report these to the Philippine Ozone Desk.

An accreditation and licensing system would enable the generation of this data. All direct users and handlers of ODSs should be required to record their sales and consumption and submit this to the POD.

TESDA is the government agency that is responsible for the education and training of the country's labor force. There are roughly five hundred schools and centers under TESDA's supervision. At present, service shops are only required to apply for bussiness permits which are issued by local governments. Except for construction workers, technicians are not required to obtain licenses from TESDA. While TESDA issues licenses/certifications to technicians, this is not practised on a mandatory basis. After issuing their licenses, TESDA is no longer able to monitor the techinicians.

Through its trainors training program, TESDA aims to build up the capacity of trainors and instructors from various vocational schools. There are roughly 30,000 trainors in the Philippines. TESDA can only train 13,000 trainors per year due to budget constraints.

TESDA currently offers a three year course on commercial refrigeration. This course does not include refrigerant recovery, leak detection, and new refrigerants in its curriculum. For the course to be more useful and effective, the curriculum needs to be revised to add the environmental aspects. TESDA offers a two-week skills upgrading course on refrigeration for walk-in students and out-of-school youth.

There are problem areas that need to be addressed. One problem area is the lack of emphasis on leak detection and repair by trainors. More skills upgrading courses are necessary. Another problem is the lack of equipment both in technical schools and in service shops. The training becomes less effective as technicians are not able to apply what they learn because they do not have the necessary equipment when they go back to their shops.

TESDA is the government agency that is responsible for the education and training of the country's labor force.

There is a need for more coordination and cooperation between DENR and TESDA. Currently, there is only one project being worked on by these two agencies and UNIDO, called the "National CFC Recovery and Recycling Scheme Project for the Philippines. In implementing the accreditation, licensing and training measures, greater coordination between these government agencies would be required. Instititutional capacity building, especially on the part of TESDA, may also be necessary to strengthen and support its technical training program.

The training program should focus on recovery and recycling techniques, new refrigerant handling, leak detection and repair, service maintenance measures to minimize emissions, retrofitting from ODS to non-ODS and construction of simple recovery equipment. The program should train as many technicians as possible across the country. It should cover commercial and industrial refrigeration and other stationary services. It is necessary to create a critical mass in available service shops if widespread use of alternative substances is to take root.

In addition, the program should also assist trainees to become advocates of ODS phaseout.

It is necessary to create critical mass in available service shops if widespread use of alternative substances is to take root. Advocacy training for service technicians from SMEs as well as those from large establishments should be pursued.

3. Information and Education Campaigns

3.1 Establishment of intensive information and education campaigns

There is a need to intensify information and education campaign (IEC) programs on the ozone layer problem. As it is, much still remains to be done in terms of widespread information dissemination especially for consumers and small businesses (eg. car repair shops, refrigeration, and airconditioning service shops), which unlike large sized companies, do not have information networks to rely on. Consumers still lack awareness on the ozone problem and the use of ODSs. They do not discriminate between products containing or products using ODSs to those which are produced using non-ozone depleting substances.

3.2 Increasing the availability of more information on ODSs and available ODS alternatives and information about what other countries are doing

The past years of information and education focused mostly on awareness and the need to phase out ODSs. While this should be continued, a more detailed and intensive information campaign must be undertaken. Information regarding alternative substances, their price and availability and new retrofitting technology must be disseminated. This is in consonance with the shift of projects from large industrial firms, which have largely been dealt with in the previous phaseout program, to SMEs and consumers.

Information and education campaigns directed to increasing the use of non-ODS using appliances and equipment should be extensively implemented. Labeling schemes maybe helpful in guiding and encouraging consumers to patronize these ozone-friendly products.

The approach must be focused and multisectoral. Other organizations and agencies, aside from the DENR, have to take the lead in particular IEC activities. The DTI, through their incentive schemes, and Local Government Units (LGUs), through their business permitting systems, should integrate information and education campaigns on ODS phaseout and alternatives. The TESDA and vocational schools in their training programs for appliance and equipment servicemen could do the same.

The approach must be focused, and multisectoral. Other organizations and agencies, aside from the DENR, have to take the lead in particular Information, Education, Communication activities.

Since the Philippines is not an ODS-producing country, the importers of ODSs and its alternatives are vital participants in sending information about the need for and the requirements of the country's phase out programs to the myriad of secondary and tertiary users. The same could be said of appliance or equipment marketing associations.

The field offices of government agencies such as the DENR and DTI will be the information center where questions can be answered and information materials can be acquired. These field offices will be the nuclei of these agencies' continuous IEC programs.

Given the above, the IEC program will be implemented in two broad phases: Phase I where the multisectoral participants to its full implementation (DENR and DTI's central and field offices, TESDA, vocational schools, LGUs, industries, importers, appliance marketing associations and consumer associations) become the initial target audience and a Phase II where these multisectoral participants become IEC implementors with the general public as target audience. The second phase necessarily includes the organization of these participants into a coordinated whole. The Philippine Ozone Desk (with the help of an electronic communication network) will facilitate fast exchange and update of information.

Intensive information and education campaigns requires the wider participation of different sectors and agencies. This necessitates greater coordination efforts among the EMB, the private sector, covering SMEs and large firms, firms which have already completed their phaseout projects, importers of ODSs, NGOs, and academic institutions including TESDA and vocational/technical schools.

3.3 Adoption of positive and negative Eco-labeling.

Suppliers and importers should be required to label their products as hazardous or non-hazardous to the ozone layer on the basis of their effects on the ozone layer. This is one way of teaching consumers to differentiate between ODS-using and non-ODS using products and eventually influencing their purchasing behavior in favor of the latter.

Suppliers and importers should be required to label their products as hazardous or non-hazardous to the ozone layer on the basis of their effects on the ozone layer.

The industries which have been given grants and have successfully adopted non-ODS technology should be most active in the labeling scheme and promotion of their non-ODS using products. Partnership among the DENR, DTI's Bureau of Product Standards, and consumer associations, would provide the needed public support. (see Appendixes - for the copy of MOA signed by the DENR, DTI and the private sector to support the eco-labeling program.)

4. Institutional Measures

Institutional strengthening is needed. This is one area where support from the Multilateral Fund is necessary. Among the important areas for institutional strengthening are:

4.1 Strengthening of DENR's links with the Bureau of Customs to curb smuggling and strengthen the monitoring of controlled substances

Efforts should be made to expedite the issuance of the Memorandum of Agreement between the DENR and the Bureau of Customs.

4.2 Improvement of the import monitoring procedures to prevent smuggling of ODSs

4.3 Strengthening the monitoring role of DENR Regional Offices.

DENR's manpower should be strengthened to boost its capability to manage quotas and undertake information and education campaigns. DENR could monitor backtracking firms that have already shifted, report on ODS smuggling and other problems, and ensure compliance of use of non-ODS technology as required by ECC conditions. They could also serve as information education dissemination centers.

4.4 Improvement of DENR's networking activities with banks emphasizing the implementation of Central Bank Circulars covering ODSs

4.5 Strengthening the Philippine Ozone Desk (POD) and defining the functions of the Technical Working Group (TWG) and Program Steering Committee

The POD of the DENR (then known as the Montreal Protocol Desk) was created in the early 1990s as the lead agency responsible for formulating the policy framework for the implementation of the Montreal Protocol and for coordinating the preparation of the PCP. Specifically, its major tasks included:

- ensuring compliance of timetables set for reducing ODS consumption
- strengthening procedures for restricting imports
- coordinating with relevant government agencies
- working on phaseout projects
- evaluating effectiveness of phaseout activities
- collecting national data on ODS consumption.

The POD needs to be strengthened as a permanent unit at the DENR bureaucracy. It also does not have funding allocations from the government. Its past operations have been financed through the Multilateral Fund, and in the absence of foreign assistance, the sustainability of the Desk would be in question. However, this does not prevent donor institution to provide funding for institutional strengthening and technical assistance projects.

Still, a more permanent solution to the funding requirements must be addressed as its role in the ODS phaseout process is a very crucial one.

Strengthen DENR's links with the Bureau of Customs to curb smuggling and strengthen the monitoring of controlled substances.

The Technical Working Group and Program Steering Committee were created as advisory groups to provide overall guidance and direction in the development of the Philippine Country Program. In light of the new roles that have been defined and new agencies that have been identified in the updating process, there may be a need to define the functions of the TWG and the PSC more clearly and include representatives from other relevant government institutions and as the private sector.

4.6 Strengthening DENR's manpower to boost its capability to manage quotas and undertake information and education campaigns

4.7 Streamlining the import clearance procedures and designate alternates to current signatories

4.8 Coordination of DENR with export processing/free trade zones regarding the existing regulation on ODSs in the country as these zones may be used as entry points for controlled substances

The DENR and BOC should undertake activities aimed at informing PEZA and the independent management authorities of these Zones about the issue of ozone depletion, the impending phaseout of most ODS, and the activities being completed as part of the BOC's Action Plan to strengthen the monitoring and control of imports of ODS and ODS-using equipment. The initial activity to be completed by DENR and BOC will be meetings with the management authorities of Subic Bay and Clark Field. Additional activites will then be initiated based on the outcome of these meetings, and the effort will be expanded to include other Zones and PEZA as determined appropriate by DENR and BOC.

4.9 Strengthening DENR's networking activities with other agencies especially in its information education campaign program

5. Regular Review of the Country Program

A review of the Country Program should be conducted every five years. This is important in order to assess compliance with targets and reassess ODS phaseout policies. Regular review would allow policymakers and implementing agencies to know whether targets are being achieved or whether there are implementation lags and what adjustments in terms of policies are needed.

A regular review of the Country Program would enable continuous data and information verification and gathering that is necessary in assessing targets. Currently, the POD is only able to monitor importation by substance. ODS consumption patterns by the different sectors/end-users is not presently monitored. While this should be a component of the monitoring system, no such data collection is being undertaken.

A regular review of the Country Program would enable the continuous data and information verification and gathering that are necessary in assessing targets.

There is a need to strengthen data on consumption by sector, and demand of the service sector. The following industries are particularly critical: household refrigeration and air conditioning, MACs, commercial and industrial refrigeration, and other stationary services.

The production data of the commercial and industrial refrigeration sector cannot be easily established as the sector does not have any association (like the household refrigeration and airconditioning sector and the car industry). While data on imports is helpful, there are a lot of assumptions that must be made as the import data lumps together different products under one import heading.

The data limitations did not allow for the computation of the stock of commercial and industrial refrigerators and other stationary equipment which would have been useful in establishing the demand for CFCs from servicing these equipment) possible. To estimate the demand projections of these sectors, past consumption trends and some growth assumptions were analyzed.

Future research should verify these assumptions and come up with the necessary data, which could possibly be generated through the conduct of a refrigeration industry study.

Future work should include research on refrigerated trucks and fishing vessels. Thermo King, which controls 90% of the market, currently uses HFC 134a. It uses HFC 134a (for medium temperature), R-404a (for low temperature), and R-407a (for high temperature). Thermo King has a retrofitting program in place and is one of the recipients of the demonstration project on MACs recovery/recycling scheme under the Multilateral Fund through the USEPA/UNDP. to operate.

There is a need to strengthen data on consumption by sector and demand of the service sector. The following industries are particularly critical : household refrigeration and air conditioning, MACs, commercial and industrial refrigeration, and other stationary services.

6. Ratification of the Copenhagen Amendment

The Philippines is presently in the process of ratifying the Copenhagen Amendment to the Montreal Protocol. Its ratification is a priority measure. The phaseout schedule for the substances targeted by the amendment are well within the country's capability.

6.1. Additional Substances Affected by the Copenhagen Amendment

For CFCs, halons, other fully halogenated CFCs, CTC, and 1,1,1-trichloroethane (or methyl chloroform), developing countries are given until 2010 to reduce their consumption of these substances to zero.

Through the Copenhagen Amendment, new substances such as HCFCs and Methyl Bromide have been included.

6.1a. HCFCs

Hydrochlorofluorocarbons (HCFCs) are transitional refrigerants, in retrofit applications and in new equipment. HCFCs have the disadvantage of contributing to the destruction of stratospheric ozone, although to a much lesser extent than CFCs. The use of HCFCs have been allowed until safer alternatives are made available. This approach is believed to have higher environmental and health benefits.

HCFC-22 has been used as a refrigerant for many years. It is the primary refrigerant used in small to medium sized air conditioners, and has increasingly been used in medium temperature retail food refrigeration systems. HCFC 123 holds promise as the primary replacement for CFC 11 in low pressure centrifugal chillers. HCFC 124 has potential applications in blends as a refrigerant in chillers and other refrigeration equipment.

HCFC 22 is widely used in the Philippines followed by HCFC 141b and HCFC 123.

6.1b Methyl Bromide

Methyl Bromide is used in the country primarily as a soil, grain, and commodity fumigant. Total Methyl Bromide consumption is allocated as follows: 54% soil treatment, 38% quarantine treatment, and 6 % other miscellaneous treatment (UNDP Survey on Methyl Bromide). Methyl Bromide has been widely used as soil sterilant in banana plantations, golf course constructions and tobacco fields. For developed countries, the Copenhagen Amendment, adopted in November 1992, froze the production and consumption of Methyl Bromide at 1995 levels.

The phaseout schedule for the substances targeted by the Copenhagen Amendment is well within the country's capability.

There are currently numerous available chemical and non-chemical pesticides which effectively control the pests for which Methyl Bromide is used. The US Environmental Protection Agency has identified the following Methyl Bromide alternatives:

(i) Soil Fumigation/Sterilant

Chemical Alternatives: 1,3-dichloropropene, dazomet, chloropicrin, metham sodium, selective contact insecticides and herbicides

Non-chemical: crop rotation, organic amendments, steam, solar heating, biological control agents, cultural practices, plant breeding

(ii) Commodity Quarantine

Chemical: phosphine, carbonyl sulfide

Non-chemical: irradiation (controlled atmosphere utilizing nitrogen and carbon dioxide and heat/cold)

(iii) Structural Pest Control

Chemical: sulfuryl fluoride, phosphine, contact insecticides and rodenticides

Non-chemical: controlled atmospheres utilizing nitrogen and carbon dioxide and heat/cold

Research on alternatives is currently underway through a UNDP implementation project on "Demonstration , Training & Policy Development on Alternatives to Methyl Bromide in Banana Soil Fumigation" which will likely result in a wide range of options in the future. While economic disparities may occur in the short-run, alternatives will be feasible in the long-term.

The import data shows that since 1994, there has been a decline in the use of Methyl Bromide. This decline can be attributed to the introduction of alternatives to Methyl Bromide. For instance, in soil fumigation, the use of Basamid in banana plantations starting in 1993 has contributed greatly to the reduction in the consumption of Methyl Bromide. Note that prior to 1993, the banana industry used more than 60 MT of Methyl Bromide annually (UNDP Survey on Methyl Bromide). This was roughly half of the total yearly importation of Methyl Bromide. Most large-scale banana plantations, are multinational companies. Unlike the other substances, the current shift taking place in Methyl Bromide may not be a permanent one and may still change depending on market demand and supply conditions.

The UNDP Survey reported that Basamid is a feasible replacement for Methyl Bromide for the control of pests and diseases in farm plantations. The use of Bazamid reduces the time lag between treatment and replanting. Moreover, its use does not leave bromine residue. Production downtime is reduced as the first banana fruits in soil treated with Basamid no longer need to be cut and destroyed.

The import data shows that since 1994, there has been a decline in the use of Methyl Bromide.

Another user of Methyl Bromide which has switched to methyl bromide alternatives is the National Food Authority (NFA). This government agency procures and stores rice and other cereal grains and used Methyl Bromide to fumigate its grain inventory. Since 1990, the NFA has stopped using this substance and shifted to phosphine, an alternative fumigant. According to the UNDP Survey, phosphine fumigation in other commodities/wood products was found to be successful and countries like the US and Japan allow the importation of commodities treated with phosphine gas.

A wide range of key Philippine exports are treated with Methyl Bromide. These products represented about 4 percent of the total value of Philippine exports in 1995. These include abaca fiber, basketwares, handicrafts, tobacco, bananas and banana products, and coffee beans among others. The use of Methyl Bromide by the export sector has been largely influenced by the quarantine requirements of importing countries. Australia's quarantine requirements specify that commodities exported by the Philippines to Australia must be treated with Methyl Bromide. Pest control operators confirm that a large number of their Methyl Bromide fumigations are for commodities destined to some countries.

6.2. Implications

Table 14 describes the provisions under the Copenhagen Amendments and their possible implications for developing countries. For CFCs, halons, other fully halogenated CFCs, carbon tetrachloride, and 1,1,1-trichloroethane (or methyl chloroform), developing countries are allowed to delay their phaseout date for ten years. Developing countries are entitled until 2010 to reduce their consumption of these substances to zero. Except for consumption intended for the service sector, the Philippines has advanced its phaseout targets for these controlled ozone depleting substances.

For HCFCs, the Copenhagen Amendment require a freeze in the production and consumption by 2016 based on the calculated level of consumption in 2015. Developing countries must reduce their consumption of HCFCs to zero by 2040.

For HBFCs, the Copenhagen Amendment require a 100 percent reduction by 1996.

For Methyl Bromide, the Copenhagen Amendment requires a freeze by year 2002 based on the average annual calculated level of consumption and production for the period 1995-1998. The current level of consumption of Methyl Bromide and HCFCs as well the demand projections for HCFC 22 indicate that the Philippines is within the control schedules and phaseout dates specified for developing countries. Table 16 shows that while the trend for HCFCs is expected to increase, there is sufficient time to carry out phaseout projects under the Multilateral Fund (the phaseout year is 2040 for developing countries).

The current level of consumption of Methyl Bromide and HCFCs as well the demand projections for HCFC 22 indicate that the Philippines is within the control schedules and phaseout dates specified for developing countries.

Table 14: Copenhagen Amendment and the Three Alternative Scenarios

ODS	Alternative Scenarios			Copenhagen Amendment[1] (As Adjusted in 1995)	Comments
	Conservative	Midrange	Optimistic		
CFCs	New: 1998 Service: 2010	New: 1998 Service: 2007	New: 1998 Service: 2004	2010: 100%	New: On Target Service: On Target
Halons	1998	1998	1998	2010: 100%	On Target
Other CFCs	1998	1998	1998	2010: 100%	On Target
CTC	1998	1998	1998	2010: 100%	On Target
TCA	1998	1998	1998	2010: 100%	On Target
HCFCs	Increasing Trend			2016: freeze 2040: 100% Baseline: 2015 calculated level of consumption	Achievable; Subject to implementation of phaseout projects
HBFCs	No record imports of HBFCs			1996: 100%	
MB	Declining Trend			2002: freeze 2005:20% and 2015: 100% baseline: 1995-1998 average annual calculated level of consumption and production with exemptions for critical uses and quarantine and pre-shipment applications	Achievable; Subject to implementation of phaseout projects

[1]The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as adjusted and amended by the second meeting of the Parties (London, 27-29 June 1990) and by the Fourth Meeting of the Parties (Copenhagen, 23-25 November 1992) and further adjusted during the Seventh Meeting of the Parties (Vienna, 5-7 December 1995).

As part of Philippine phaseout efforts, a "Demonstration Project for Alternative Technologies to Methyl Bromide as Soil Fumigants in Banana Plantation" will be implemented by the DENR with UNDP support. This project will study the feasibility of using Integrated Pest Management (IPM) based technologies for controlling the Moko disease which affects banana plantations. The project will provide technical training for farmers and extension agents. It will also develop and suggest policy measures to monitor and control importation and use of Methyl Bromide.

Table 15 shows that the phaseout schedule of HCFCs and Methyl Bromide in the Copenhagen Amendment are achievable provided phaseout projects are implemented and financial assistance through the Multilateral Fund is extended to domestic firms and users of these substances. There are no records of HBFC importation at EMB.

With respect to CFCs, halons, other CFCs, CTC, and TCA, the current Philippine phaseout schedules are set earlier than those in the Copenhagen Amendment, except for servicing. It is expected that the targets will be met with the completion of ODS phaseout projects, with the banning of imports of new and used CFC-based equipment and with the implementation of recovery and recycling projects. On this basis, it is suggested that Copenhagen Amendment be ratified. The following recommendations are also suggested:

6.2a HCFC 22

- In the long run, HCFCs may not be acceptable alternatives. The Copenhagen Amendment to the Montreal Protocol limit the use of HCFCs where there are other more environmentally sound alternatives. There is, a need to further study the applicability, safety, toxicity, and affordability of substitutes as well as their impact on human health and on the environment.

6.2b. Methyl Bromide

- There is a need to look at countries which require the use of Methyl Bromide. This may prove to be important to the Philipines because it exports a large number of Methyl Bromide treated products to these countries.

Table 15: Demand Trends for HCFCs and Methyl Bromide

Subtance/Sector	Consumption/a		ODS Reduction from Phaseout Projects	Consumption Forecasts													
	1995	1996		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
HCFC 22 Rm Airconditioning	1668	2071		268	290	332	394	454	534	619	666	759	854	991	1117	1205	1356
Manufacturing				201	201	221	243	267	294	323	355	391	430	473	520	572	630
Service/c				67	89	111	151	187	240	296	311	368	424	518	597	633	696
Other HCFCs	628	267		539	Increasing Trend												
Methyl Bromide	68/b	54/b		52/b	Declining Trend												

Notes:
a/: based on EMB data
b/: based on FPA data
c/: based on the assumption that the average life of the appliance is fifteen years and is serviced twice during its lifetime

C. Supplementary Measures

In addition to the list of priority measures discussed above, it is necessary to implement the following supplementary measures to ensure that targets are achieved:

1. Fiscal Measures

1.1 Inclusion of industries shifting to non-ODS technologies in the BOI's 1999 Investment Priorities Plan

Activities in compliance with multilateral agreements such as the Montreal Protocol on Ozone Depleting Substances and the International Convention on Climate Change are considered statutory inclusion in the IPP of 1999.

Further, it maybe worth noting that a current effort related to the overall initiative to clean the environment is the proposed extension of the tax and duty free importation of capital equipment such as those which are needed for pollution control and abatement. This proposed incentive will be part of the bill on the rationalization of fiscal incentives to be submitted by the DOF to the Congress.

1.2 Requirement of the use of non-ODS equipment by BOI-approved projects

1.3 Imposition of environmental tax on ODS

The inclusion of industries shifting to non-ODS technologies in the 1999 Investment Priorities Plan of the BOI will allow firms to avail of fiscal incentives like income tax holidays. An imposition of excise taxes on ODSs could also discourage its consumption and generate revenues which could possibly (though not necessarily) be earmarked for programs/projects related to ODS phaseout. (Similarly, imposition of higher tariffs on ODS imports is suggested under trade measures.) In the absence of an import ban, it would be necessary to pursue these fiscal measures.

A tax measure will need legislative action before it could be implemented. It would require an amendment by legislation of the 1997 National Internal Revenue Code, specifically Chapter IV which covers excise tax on miscellaneous articles. An additional section that would reflect the imposition of environmental tax on the sale or importation of hazardous elements or substances will be needed. The EMB, in coordination with other agencies, could work for the passing of an Administration sponsored bill covering these measure. The Clean Air Act could also be utilized to earn work funds for ODS phaseout activities. Agencies that need to coordinate for this undertaking will be the EMB, DOF and NEDA.

2. Other Trade Measures

2.1 Imposition of higher tariffs on ODS

Any restriction on the volume of imports can be supplemented with the imposition of higher tariffs on ODSs. This would narrow the gap in the relative prices between the ODSs and its corresponding non-ODS substitute and discourage its use. In addition, lower tariffs on imports of alternative substances could be imposed to encourage their use. However, tariff already at 3% cannot be reduced further.

The tariff measure would need legislation and could be elevated to the TRM.

3. Other Measures

3.1 Continuation of search for alternatives, e.g. develop other blends to add to identified list of alternatives.

There is a need to study these alternatives with respect to their applicability, safety, toxicity, and affordability as well as their impact on human health and on the environment.

This measure should be implemented in coordination with the DOST and the private sector.

3.2 Inclusion of the use of non-ODS using alternatives and /or non-ODS using equipment as a provision under Environmental Compliance Certificate issued to development projects

Consistent with Article II, Section 2 of Presidential Decree No. 1586 which stipulates that no project which falls within the scope of the EIS System shall be implemented without first securing an ECC, the use of non-ODS using alternatives and/or non-ODS using equipment should be included as one to the requirements.

3.3 Requesting the Tariff Commission for separate tariff headings for identified ODS

The ODSs enumerated in the list of regulated commodities issued by the Central Bank does not include all ODSs that EMB regulates. It was learned that CFCs were the only ODSs for which the Bureau of Customs required the submission of import clearances issued by the EMB. BOC officials use CB Circular 1389 as guide in determining which chemicals require import permits.

CB Circulars are applicable only in so far as Lines of Credits are concerned. Even with out the CB Circular, RA 6969 has already given DENR ample authority to regulate all ODS imports.

CB Circular 1389 lists the following ozone depleting substances as regulated commodities requiring import clearance from EMB:

Commodity Description	PSCC
Chlorofluorocarbons (CFCs)	511.38.01
Halons and other fully halogenated CFCs	511.38.09
Carbon Tetrachloride	511.36.04
Trichloromethane (Chloroform)	511.36.03
Hydrobromofluorocarbon	511.38.09
Methyl Bromide	511.37.00

By checking the Philippine Standard Classification Code Book, the codes of some regulated commodities include other substances other than those described in the list of regulated commodities. For instance, PSCC 511.38.09 is described in the Book as "other halogenated derivatives of acyclic hydrocarbons containing two or more different halogens" while PSCC 511.37.00 covers a wider range of substances "fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons". Trichloromethane (chloroform) is not an ozone depleting chemical, but it is included in the Central Bank's list of regulated ozone depleting substances. On the other hand 1,1,1 trichloroethane a substance which is supposed to be regulated, does not appear in the list. This loophole weakens EMB's import monitoring function. The EMB data on TCA imports becomes understated as not all TCA importers report to EMB. Some TCA importers are able to open Lines of Credit and pass through the Bureau of Customs without the necessary import permits.

DENR should formally request the Tariff Commission for separate tariff headings for the controlled substances.

4. Other Specific Recommendations

4.1 On Halon

- Setting of a clear phaseout schedule with clear guidelines on importation and sale
- Inventory of halon uses to determine existing stock
- Clarification of the definition of essential use of halon
- Expedition of the implementation of the halon banking project

The EMB should coordinate the implementation of these measures with the DTI-BPS and DOST and possibly the AFP.

4.2 On Recycling and Recovery Program

- Encouragement of use of locally designed and produced recovery and recycling equipment

TESDA and DOST, through applied research, can develop these equipment at a lower price. The UNIDO Project only provides for a small percentage of the total needed equipment while the USEPA Project has been faced with operational problems on the equipment that were distributed to MACs service shops.

- Granting of tariff reduction for recovery and recycling equipment if there is an absence of locally designed and produced Recovery and Recycling equipment with parallel specifications

- Inclusion of recovery and recycling projects in the BOI Investment Priorities Plan

The EMB should coordinate the implementation of these measures with the TESDA and DOST.

4.3 Creation of a finacing mechanism for sustainability

The sustainability of ODS phaseout efforts requires the availability of funds to be used for this purpose. A financing mechanism should be established based on the following funding sources:

- Request more funding from the Multilateral Fund (especially for SMEs)
- Set up a trust fund for research under RA 6969
- Possibility of using funds from collection of suggested excise or other taxes (and/or processing fees) related to ODS
- Private donations

4.4 On Metered Dose Inhalers (MDIs)

- Exemption of MDIs from import ban until the availability of viable alternatives
- Estimation of consumption of MDIs and study alternatives (toxicity, safety and flammability)

4.5 On dealing with contrabands

- Clarification of policy on cost of decommissioning smuggled equipment
- Exploration of export country liability

In the absence of destruction facilities, government policy must be clear on who will shoulder the cost of converting/decommissioning the smuggled CFC based equipment. Another option could probably be to pursue the possibility of the inclusion of an export country liability to be worked out as a provision within the Montreal Protocol framework.

4.6 Implications on the roles of the different agencies/sectors

The phaseout activities and strategies outlined above would require the involvement of different sectors, mainly government institutions, the private sector, consumer groups and non-government organizations. Listed are the following agencies and institutions and their respective roles:

Government

- **Department of Trade and Industry (DTI)**- incentives, information dissemination, monitoring, especially for SMEs, and eco-labeling

Board of Investments (BOI) - inclusion of non-ODS technologies in its Investment Priorities Plan

Bureau of Product Standards (BPS) - monitoring of halon consumption and importation, information dissemination, and developing standards for "ozone-friendly" products.

- **Department of Science and Technology** (DOST) - research and development and technology transfer

Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) - monitoring ozone depletion and information dissemination through PAGASA's 200 weather stations

• **Department of Environment and Natural Resources (DENR)** - quantifying the effects of ozone depletion and information dissemination

• **Department of Foreign Affairs (DFA)** - facilitate ratification of Copenhagen Amendment and monitoring the implementation of the Montreal Protocol

• **Department of Education, Culture and Sports (DECS)** - IEC at all school levels

Technical Educational and Skills Development Authority (TESDA) - training with vocational and other training organizations, including the handling of ODS alternatives in TESDA's trade tests and involvement in the accreditation and permitting process

• **Department of Health (DOH)** - researching on assessing the health risks of exposure to harmful ultraviolet rays (UV) as a result of ozone layer depletion, information dissemination on the potential health effects of ozone depletion and on the measures to lessen the exposure to the harmful UV rays

• **Department of Agriculture (DA)** - information dissemination and monitoring Methyl Bromide consumption and importation and CTC consumption for soil fumigation

Fertilizer and Pesticides Authority (FPA)- information dissemination, policy advocacy, implementation of demonstration project on Methyl Bromide and monitoring Methyl Bromide consumption and importation

• **Department of Finance (DOF)** - financing/. tax measures, support for a legislative proposal on such measures

Bureau of Customs (BOC) - implementing trade measures, data generation and monitoring. The BOC would require some training in identifying chemicals used in ODS-using equipment

Economic Intelligence and Investigation Bureau (EIIB) - controlling (pure) smuggling

• **National Economic and Development Authority (NEDA)** - tariff measures and support for a legislative proposal on fiscal measures

Business Sector

Firms which have already shifted - information dissemination

Importers of ODS - information dissemination and search for alternatives

Major industry associations (CAMPI, PSVARE, AHAM) - information dissemination

Other Sectors

• **Philippine Information Agency / Kapisanan Ng Mga Brodkasters Sa Pilipinas (PIA/KBP)** - information dissemination

• **Academic Institutions**-training and information dissemination

• **Non-Government Organizations (NGOs)** - information dissemination by NGOs like Environmental Brodkasters' Circle and COCAP.

• **Consumer Groups** - vigilance in validating or confirming eco-labeling measures by the private sector

Table 13: Summary of Recommendations for ODS Phaseout

Priority Measures	Agency Responsible
1. Trade Measures	
On Importation of ODS	
1.1 Implementation of non-automatic import license system for CFC 11 and 12	CCO to be issued by the DENR
1.2 Imposition of import ban on other ODS by scheduled phaseout	CCO to be issued by the DENR
On Importation of ODS-using equipment	
1.3 Imposition of an import tax on ODS-using equipment	TRM/NEDA
1.3.1 Expedition approval and Implementation of CCO	DENR-EMB/POD
1.3.2 Working for the inclusion of a ban on ODS-using equipment in the Clean Air Act	
1.3.3 If the first two channels fail, preparation of a position paper for the consideration of the committee on Trade and Related Matters (TRM)/NEDA	
2. Training, certification, accreditation, and licensing of importers, handlers and service technicians DENR, TESDA, training schools	DENR, TESDA, Training Schools, academic institutions
Development of a program which will spur the creation of a critical mass of trained accredited service shops for funding under the MLF and include advocacy training for service technicians to become advocates of the phaseout and use of non-ODS	
3. Information and Education Campaign	
3.1 Implementation of an intensive information and education campaign on the ozone layer problem	DENR, DTI, PAGASA, PIA/KBP
3.2 Making available more information on ozone depleting substances and available ODS alternatives. (Include awareness about what other countries are doing)	NGOs, firms that have already shifted
3.3 Adoption of positive and negative ecolabeling by requiring industries to label their products in terms of their impact on the ozone layer.	
4. Institutional Strengthening Measures	
4.1 Strengthening of DENR's links with the BOC	DENR-EMB/POD, BOC
4.2 Improvement of the import monitoring procedures to prevent smuggling of ODS	POD, BOC, EIIB
4.3 Strengthening of monitoring role of DENR regional offices	DENR, POD
4.4 Improvement of DENR's networking activities with banks	DENR, Banking Sector
4.5 Strengthening of EMB for a more effective supervisory and coordinating role and define the functions of the TWG and Steering Committee and include newly identified agencies	DENR-EMB/POD, TWG
4.6 Strengthening of DENR's manpower to boost its capacity to manage quotas and undertake information and education campaign	
4.7 Streamlining of procedures for the issuance of clearances of EMB regulated substances especially ODS alternatives	
4.8 Coordination of the DENR with export processing zones regarding existing ODS regulations	
4.9 Strengthening of DENR's networking activities with other agencies	
5. Constant updating of the Country Program	DENR-EMB/POD, TWG
5.1 Continuation of policy updating and monitoring	
5.2 Continuation of data gathering to address data gaps	
6. Ratification of the Copenhagen Amendment	DENR - EMB, DFA, Senate

Table 13: Summary of Recommendations for ODS Phaseout

Supplementary Measures	Agency Responsible
1. Fiscal Measures	
1.1 Inclusion of industries shifting to non-ODS technologies in BOI's 1999 IPP	DENR-EMB, BOI
1.2 Requiring BOI-approved projects to use non- ODS using equipment	DENR-EMB, BOI
1.3 Imposition of environmental tax on ODS	DENR, DOF, NEDA, Congress
2. Other Trade Measures	
2.1 Imposition of higher tariffs on ODS	TRM/NEDA, POD/EMB-DENR
3. Other Measures	
3.1 Continuation of search for alternatives	POD/EMB-DENR, DOST
3.2 Initiation of inter-agency dialogues with other agencies involved in international environmental agreements	DENR, DFA, Climate Change Committee
3.3 Eco-labeling of products that use non-ODS	DTI/BPS, POD, Private Sector
3.4 Inclusion of use of non-ODS products and equipment as a requirement in the issuance of ECC	DENR
3.5 Requesting the Tariff Commission for separate tariff headings	DENR, Tariff Commission
4. Specific Measures	
4.1 Halon	
Setting a clear phaseout schedule with clear guidelines on importation and sale.	DENR-EMB/POD, TESDA, DOST
Determination of existing stock thru inventory	
Searching for drop-in alternatives	
Expediting the implementation of halon banking project	
4.2 Recovery and Recycling	DENR-EMB/POD, TESDA DOST
Exploration of locally designed and produced recovery and recycling equipment	
Granting of tariff reduction for recovery and recycling equipment	
Inclusion of recovery and recycling projects in BOI IPP	
4.3 Setting up of financing mechanism for sustainability	DENR-EMB/POD, DFA, TWG
Requesting of more funding from MLF especially SMEs	
Setting up trust fund for research under RA 6969	
Possible usage of funds from collection of suggested excise or other taxes and/or processing fees related to ODS	
Private donations	
4.4 MDIs	DENR-EMB/POD
Exemption from import ban until availability for viable alternatives	
Estimating consumption of MDI and study alternatives	
4.5 Contrabands	DENR-EMB/POD, DFA, BOC
Exploration of export country liability	

Appendices

Development of Control Measures Under the Montreal Protocol

Substances (Base-Line)	Montreal September 1987	London June 1990	Copenhagen November 1992
Chlorofluorocarbons CFCs 11, 12, 113, 114, 115 Annex B, Group I (1986)	mid 1989: freeze mid 1993: -20% mid 1998: -50% ----	mid 1989: freeze 1995: -50% 1997: -85% 2000: -100%	mid 1989: freeze 1994: -75% 1996: -100% ----
Halons 1211, 1301, 2402 Annex B, Group II (1986)	1992: freeze ---- ----	1992: freeze 1995: -50% 2000: -100%	1992: freeze 1994: -75% ----
10 other CFCs Annex B, Group I (1989)	---- ---- ----	1993: -20% 1997: -85% 2000: -100%	1993: -20% 1994: -75% ----
Carbon Tetrachloride Annex B, Group II	---- ----	1995: -85% 2000: -100%	1995: -85% 1996: -100%
Methyl Chloroform Annex B, Group III (1989)	---- ---- ---- ----	1993: freeze 1995: -30% 2000: -70% 2005: -100%	1993: freeze 1994: -50% 1996: -100% ----
HCFCs (1989 plus 3.1% of CFC consumption in 1989)	----	2020 but not later than 2040 (non-binding)	1996: freeze 2005: 35% 2010: -65% 2015: -90% 2020: -99.5% 2030: -100%
HCFCs Annex C, Group II	----	----	1996: -100%
Methyl Bromide Annex E (1991)	----	----	1995: freeze

Note: All control measures are related to production and consumption of substances except for HCFCs which only have consumption restrictions.

---- no regulation

Legislations Affecting The Montreal Protocol

After the country signed the Montreal Protocol on September 14, 1988, it was submitted to the Philippine Senate for ratification in July 1989. In May and July 1990, the foreign relations committee conducted hearings on the Protocol. The concern over the effects of CFCs on the ozone layer and the global warming problem prompted legislative inquiry in the Philippines. Senate Resolution Number 426 directed the appropriate Senate Committee to look into the earth's greenhouse effect in relation to Philippine situation. It's tasks are to study major concerns relating to the production of goods using CFCs and to recommend measures which would utilize alternative technologies, to regulate or eventually ban or phaseout ozone depleting chemicals, and to disseminate the effects of international protocols on saving the ozone layer. Senate Resolution Number 482 directed the Committee on Environment and Natural Resources, Committee on Health and Committee on Trade and Commerce to conduct an inquiry into the extent of production, use, sale and importation of CFCs in the country and look into the possibility of finding practical substitutes for these chemicals.

With the presence of strong and public sentiment to protect the ozone layer, the Philippine Senate ratified it on March 21, 1991. Senate Resolution 108 was filed in September 1992 directing the Committee on Energy and Environment and Foreign Relations to conduct immediate inquiry for the ratification of the 1990 London Amendment to the Protocol. These amendments were approved in March 1993 by Senate Resolution No. 25. In October 1992, Senate Bill No. 894 (Ozone Layer Protection Law of 1992) was introduced to implement the Montreal Protocol. This Act would prohibit the importation of substances controlled by the Montreal Protocol if said importation would contravene the provisions of the Protocol as amended in London in 1990. It would impose penalties on any person who violates this law; regulate the importation of controlled substances in the country to ensure that their use is in accordance with the Montreal Protocol; and designate the Department of Environment and Natural Resources (DENR) in coordination with the Department of Trade and Industry(DTI) and the Department of Science and Technology (DOST) to issue rules and regulations on the importation of controlled substances. This was referred to the Committee on Environment on February 1993, but since then, no action has yet been taken. To date, no resolution has been introduced to ratify the Copenhagen Amendment to the Protocol.

The regulation of the consumption of ozone depleting substances in the country is presently covered by Republic Act 6969 (Toxic Substances, Hazardous Wastes, and Nuclear Wastes). In 1990, Congress legislated this Act in response to the increasing problems of toxic chemicals. RA 6969 aimed to regulate and control all unregulated chemicals, hazardous wastes and nuclear wastes in the Philippines. It authorized the DENR to prohibit or limit the manufacture, importation, reprocessing, distribution, use or disposal of hazardous chemicals. In 1992, the DENR promulgated Administrative Order No. 29 outlining the implementing rules and regulations of RA 6969.

The DENR identified CFCs and halons as the first chemicals for immediate regulation and phaseout. In 1993, the Central Bank issued Circular Number 1389 as amended by Circular Number 2 designating the EMB as the regulating agency

for the importation of CFCs instead of the Bureau of Food and Drug which used to monitor these substances. The following substances have also been included in the list of commodities requiring import clearance from EMB: halons and other fully halogenated CFCs, carbon tetrachloride, trichloromethane (chloroform), hydrochlorofluorocarbon, hydrobromofluorocarbon, and methyl bromide.

The regulatory system of the DENR does not only cover controlled substances under the Montreal Protocol, but includes HCFC 22 and other transitional and potential substitute chemicals. On September 8,1998, DAO 98-58 was issued providing the Priority Chemicals List (PCL) pursuant to Section 19, Chapter 4, Title 2 of the DENR DAO 29. The PCL includes 111TCA, CFC, CTC and Halons. The said DAO requires users, importers and manufacturers of these chemicals to comply with certain requirements on registration and reporting using prescribed forms of the Environmental Management Bureau (EMB).

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