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

Thirteenth Meeting
Montreal, 25-27 July 1994

COUNTRY PROGRAMME: SEYCHELLES

This document consists of:

- Comments and recommendations of the Fund Secretariat
- Country Programme Evaluation Sheet (prepared by the Fund Secretariat)
- Transmittal Letter from the Government of Seychelles
- Country Programme Cover Sheet
- Country Programme

COMMENTS AND RECOMMENDATIONS OF THE FUND SECRETARIAT

COMMENTS

1. The Country Programme conforms to the format of the approved guidelines. It provides detailed and factual information of the consumption of ODS in the country and options for phasing them out. In the situation of a very small ODS consuming country (total consumption 4 tonnes ODP), the proposed restrictions and bans are likely to promote the emerging trend of market driven phase-out. However, a more challenging aspect is the supply of ODS required for servicing existing refrigeration and air-conditioning systems which, in the small island condition, tend to require more frequent maintenance and servicing.
2. A number of project proposals which include institutional strengthening (US \$32,700), setting-up a regional centre of excellence for refrigeration students, technicians and engineers (US \$8,000), drawing up statutory regulations, import regulatory requirements and enforcement procedures (at no cost), preparation of standards and code of practice (at no cost), setting up of a national refrigerant reclaim and recycling facility (US \$263,000) and setting up of a national halon bank (US \$30,000).
3. Given the situation of the country, the projects relating to regulations and code of practice would appear to facilitate the measures envisaged in the country programme for the phase-out of ODS. While a recovery and recycling activity (particularly in-situ recycling activity) in itself might also facilitate management of the residual CFC-12, the elements of the proposed activity are difficult to justify, given the consumption of CFC-12 and of halon 1211, and the scope of the problem.
4. Given the Government's action plan, it would appear that institutional strengthening activity which identifies a focal point with a strong role in awareness creation and as a facilitator/coordinator could help focus the measures to be adopted by the various sectors of the ODS market to address the phase-out situation. As a special case, the institutional strengthening project could have a special travel component which would enable the focal point to participate in national training activities of the neighbouring countries.

Institutional Strengthening

5. It is agreed that given its geographical situation and the ODS consumption pattern in the country institutional strengthening could constitute an essential element of the government's phase-out strategy. However, most of the elements of the budget in the proposal could not be supported. It is recommended that funds be provided to cater for the following:

Equipment (Photocopier, Fax machine, Computer accessories if necessary)	US \$5,000
Public awareness activities (including small group meetings, information dissemination, local travel, etc.) (US \$3,000 p.a.)	7,500
Miscellaneous operating costs, including meetings of the National Working Group, telecommunications, stationery, etc.	10,500
Participation in training activities by focal point (To be decided by Government and Implementing Agency)	6,000
Sub-total	29,000
Contingency 10%	2,900
TOTAL	31,900

RECOMMENDATIONS

The Fund Secretariat recommends as follows:

6. To approve the Seychelles Country Programme. Approval of the country programme does not denote approval of the projects therein or their funding levels.

7. In accordance with the Executive Committee decision on implementation of country programmes (UNEP/OzL.Pro/ExCom/10/40, para 135), to request the Government of Seychelles to provide information on the progress of implementation of the country programme within one year of its approval, i.e. on 31 July 1995 and annually on 31st day of July of each subsequent year.

8. To approve the amount of US \$31,900 and US \$4,150 support costs for institutional strengthening on condition that its implementation takes account of the comments made above. The activity to be included in UNEP's 1994 Work Programme.

9. To request UNEP and UNIDO to cooperate with the Government of Seychelles, within the framework of the two activities approved for UNIDO in November 1993 and March 1994 regarding a strategy for ODS phase-out in low consuming countries and assistance to UNEP in country programme preparation respectively, to design a comprehensive and cost-effective package for phasing out ODS in Seychelles, which could be used as a model for countries in a similar situation.

SEYCHELLES COUNTRY PROGRAMME EVALUATION SHEET

National Implementing Agency: Division of the Environment

Status of ratification of the Vienna Convention and the Montreal Protocol

	Signature	Ratification	Entry Force
Vienna Convention (1985)		06/Jan/93	06/Apr/93
Montreal Protocol (1987)		06/Jan/93	06/Apr/93
London Amendment (1990)		06/Jan/93	06/Apr/93
Copenhagen Amendment (1992)		27/May/93	

Production of controlled substances: 0 metric tonnes (mt)

Consumption of controlled substances (1991): 3.8 metric tonnes
(excluding methyl bromide) 4.1 weighted tonnes (ODP)

Substance (ton)	CFC						Halon			Solvents			M-Br
	11	12	113	114	115	Total	1211	1301	Total	CTC	MCF	Total	
ODS	0.4	2.4			0.7	3.5	0.3		0.3				
ODP	0.4	2.4			0.4	3.2	0.9		0.9				

Source: Country Programme (1994)

Distribution of ODP by substance:

CFC: 78.2% Halon: 21.8% CTC, MCF:

Distribution of ODP by sector:

Sector:	Aerosol	Foam	Halon	Refrig.	Solvent
Consumption (tonnes):			0.9	3.5	
Percent of total:			21.8%	85.0%	

Country Programme

Duration of country programme: 1994-2001

ODS phase-out target:

Phase out of halon by 1994 and CFRC-12 by 2001

Phase-out priority area:

Refrigeration sector

Cost of activities in country programme: \$333,700

Strategy:

The Govt. strategy involves consultations with the private sector to effect a phase-out. All imports of CFC-11 and CFC-12 will be restricted from 1994, while imports of halon will be banned. Other elements of the strategy include creation of public awareness at all levels of society and the establishment of CFC and halon reclaim/recycling centres to help meet the demand for those compounds.



Please address all correspondence to the Director General

Our Ref: MFAPE/ENV/LEG/11.1

Date: 09th June 1994

The Chief Officer
Secretariat of the Multilateral Fund
for the Implementation of the Montreal Protocol
1800 McGill College
27th Floor
Montreal, Canada H3A 3J6

Dear Sir

I have the honour to submit herewith the Country Programme of the Republic of Seychelles for the consideration and approval of the Multilateral Fund for the Implementation of the Montreal Protocol.

Seychelles adhered to the Protocol on 4th January 1993 and became a Party thereto on 27th May 1993. It is classified as operating under paragraph 1 of Article 5 of the Protocol.

I would like to place on record the appreciation of the Government of Seychelles of the assistance extended to it by or through the UNEP IE/PAC Ozone Action Programme for the preparation of the Country Programme which started during November 1993. I am pleased to say that the Government is committed to the implementation of the actions contained in the Country Programme. The decision to that effect was made by at its meeting held on the 25th May 1994.

I further assert that it is the Government's intention to monitor compliance with the Protocol. If necessary, further and different actions from those specified in the Country Programme will be updated and submitted to the Executive Committee of the Multilateral Fund.

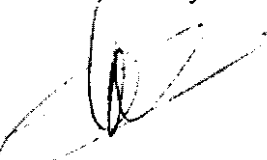
We hope that the Executive Committee will approve the request for assistance made in respect of the following actions:

2 / . . .

- a) Institutional Strengthening
- b) Regional Center of Excellence for Refrigeration Technicians and Engineers.
- c) A National Refrigerate Reclaim and Recycling Centre.
- d) A National Halon Bank.

Please accept, Sir, the assurance of my highest consideration.

Yours sincerely



G. Troian

DIRECTOR GENERAL (ENVIRONMENT)

COUNTRY PROGRAMME COVER SHEET

COUNTRY : SEYCHELLES

LEAD NATIONAL AGENCY : DIVISION OF ENVIRONMENT

PARTICIPATING IMPLEMENTING AGENCIES: UNEP/UNDP

1. Phase-Out Schedule

Substance	Consumption (1991) ODP tonnes	Planned Cumulative	Consumption	Planned year of phase-out
		until ODP Article 5 schedule	phase-out (tonnes) Accelerated Schedule	
CFC-11	0.405		0.975	1998
CFC-12	2.430		39.685	2001
CFC-115	0.388		2.249	1996
Halon 1211	0.828		2.557	1994
TOTAL	4.051		45.466	

2. Government Action Plan

Action	Brief description	Commencement	Use Sector
Control of imports	Control of ODS imports through Trade Tax regulations	1994	All
Regulations	regulations for controlling ODS use.	end 1994	All
User Sensitization	Organising forums and workshops	1994	Refrigeration
Standards	set standards on refrigeration practice.	end 1994	Refrigeration
Training (regional)	Setting up a regional centre of excellence for training .	end 1994	Refrigeration and air-conditioning
Refrigerant Bank	Set up a National refrigerant reclaim facility.	mid-1994	Refrigeration and air-conditioning
Halon Bank	Set up a National Halon Bank.	mid-1994	Fire extinguisher

3. Project Summary Table

Project	Priority	Capital Costs	Recurrent Costs
P1	1	32,700	In kind- Government
P2	1	8,000	In kind- Private Sector
P5	1	263,000	Operation Costs- Private
P6	1	30,000	Operation Costs- Private
P3	2	0	In kind- Government
P4	3	0	In kind - Gov. & Private
Total		333,700	

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION

1.1. Country Profile	Page 09
1.2. Statutory Background	Page 09
1.3. Purpose	Page 11
1.4. Status	Page 12
1.5. Assistance Received	Page 12

2. CURRENT SITUATION

2.1. Current and Forecast Consumption of ODS	Page 14
2.1.1 Current Consumption	Page 14
2.1.2 ODS Use	Page 16
2.2. Forecast Consumption	Page 27
2.2.1 Basic Assumptions	Page 27
2.2.2 ANNEX A Group I Substances	Page 28
2.2.3 ANNEX A Group II Substances	Page 33
2.2.4 Summary of Forecasts	Page 35
2.3. Industry Structure	Page 37
2.3.1 Users of ODS in Seychelles	Page 37
2.3.2 Institutional Framework	Page 37
2.4. Policy Framework	Page 42
2.4.1 General	Page 42
2.4.2 Government and Industry Responses to the Protocol	Page 43

3. IMPLEMENTING PHASE-OUT

3.1. Strategy Statement by Government.....	Page 47
3.1.1 Phase Out Schedules.....	Page 47
3.2. Action Plan.....	Page 53
3.2.1 Government Actions.....	Page 53
3.2.2 Projects.....	Page 55
3.3. Roles in Implementing Strategy.....	Page 56
3.4. Timetable and Consumption Implications.....	Page 56
3.5. Budget and Financing Program.....	Page 58
3.6. Monitoring Arrangements.....	Page 59
4. PROJECTS.....	Page 61

EXECUTIVE SUMMARY

The Republic of Seychelles deposited its instruments of accession to the Montreal Protocol in January 1993, which became enforceable in May 1993. Seychelles has also signed the London and Copenhagen Amendments to the Montreal Protocol. There is currently no production facilities of ODS in Seychelles, and therefore all the ODS needed are being imported. Seychelles as a developing country is classified as an "Article 5 Country" under Article 5(1) of the Protocol.

The programming of the Montreal Protocol has been taken up by the Division of Environment through the National Working Group on the Montreal Protocol. The formulation of the Country Program was awarded following tender to a local Consultancy firm, ENV.R.O which networked with all the actors in the field including importers, end-users, refrigeration specialists and government agencies. This Country Program reflects the commitment of the Government of Seychelles and forms the basis of action for implementation of the Montreal Protocol Agreements, through private sector participation and concerted effort.

A phase out schedule for each group of substances has been formulated in consultations between Government and the private sector. The different options considered are also described including the implementation schedule. Since different ODS are used in different sectors, the discussion involves the presentation of alternative options for all sectors.

Phase-Out Schedule

ODS	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CFC-12	2.430	2.835	8.100	7.69	6.48	4.05	4.05	1.62	1.62	0.81
CFC-11	0.135	0.270	0.270	0.210	0.180	0.180	0	0	0	0
Halon 1211	0.828	0.839	0.890	0	0	0	0	0	0	0
R-115	0.388	0.564	0.564	0.451	0.282	0	0	0	0	0

The Country program provides the foundation for the development of an Action Plan for the effective phase-out of ODS. It primarily addresses the actual situation by an in-depth review of the latest data on consumption of ODS. It also makes projections till the year 2012, based on current data, as seen below:

Projection of ODS Consumption

Year	ODS Consumption (ODP tonnes)	Per Capita Consumption*(kg)	Article 5 Country
1987	2.598	0.0398	✓
1991	4.051	0.0603	✓
2002	6.9621	0.0897	✓
2012	11.7781	0.135	✓

Within the Action Plan , the study has identified a series of six projects with all parties involved and through a seminar with the private sector. All these projects are well in accordance to the action plan proposed and would achieve the objectives within the protocol timetable. A summary of the projects can be found in the table below:

Project Summary

Project	Priority	Capital Costs	Recurrent Costs
P1	1	32,700	In kind- Government
P2	1	8,000	In kind- Private Sector
P5	1	263,000	Operation Costs- Private
P6	1	30,000	Operation Costs- Private
P3	2	0	In kind- Government
P4	3	0	In kind - Gov. & Private
Total		333,700	

The planned financial actions are such that at least \$ 300,000 is available during the year 1994. Therefore the implementation of these projects, and hence the implementation of the phase out schedule is strongly dependent on the availability of these funds in 1994.

Due to the urgency of the situation the survey has shown that the grant assistance being sought from the Fund by industry sector should be examined as a priority. Table below summarizes ODS consumption by sector and an indication of the funds being sought:

ODS Use by Sector/Implementation Plan

Sector	Purpose	Start Date	Funds Sought (\$)	Effective ODS reduct. 1994-1997 (tn)
Refrigeration and Air-conditioning	Reclaim Facilities for R-11, R-12, R-502, R-22 and R-134a	June 1994	263,000	3.809
Halon Users	Halon Bank	June 1994	30,000	0.273
Refrigeration Technicians	Regional Training	Aug. 1994	8,000	3.809

In implementing phase-out, the Government intends to take a firm commitment in meeting the goals and strategy set in Section 3.1 of the Country Program by the following actions:

Maintaining the National Working Group for the Montreal Protocol to oversee the favorable implementation of the strategy.

Restricting the importation of CFC-12, CFC-115 as from the beginning of 1994, and banning Halon 1211 importation as from January 1994.

Introducing reduced tax on goods containing ozone friendly chemicals and higher tax on ODS containing goods.

Providing the private sector with all assistance required in the implementation of the phase out strategy, e.g. priority for loans.

Organizing seminars and workshops for end-users

Setting up a permanent national secretariat for the Montreal Protocol in the DoE, which will be equipped with resource facilities and open to all citizens and companies.

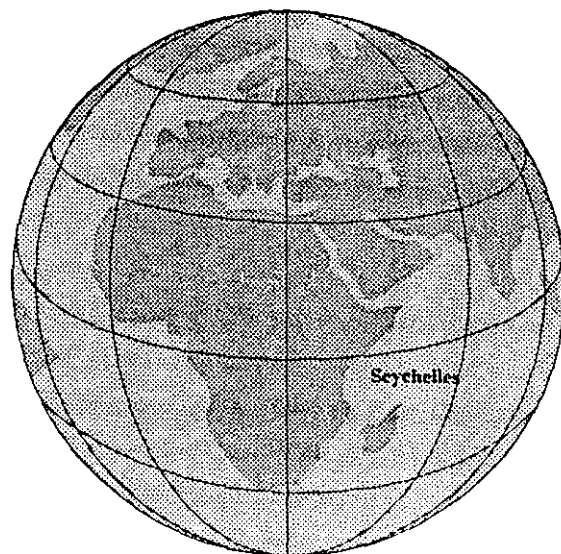
Continuing its public sensitization programs through the television, radio and newspapers.

Setting up standards for refrigeration practice, and introduce an appropriate system of certification for refrigeration engineers.

Fostering regional cooperation through the setting up of a Regional Training Center.

Monitoring of the Country Program would be the responsibility of the Ministry of Foreign Affairs, Planning and Environment (MFAPE). The Government proposals to monitor the different action strategies are as follows:

- ☐ Monitoring of annual consumption of ODS through MFAPE and the Ministry of Finance.
- ☐ Monitoring Government Actions by the NWGMP.
- ☐ Monitoring of Projects under the auspices of the NWGMP and the Environment Steering Committee.



Introduction

1.0. COUNTRY PROFILE

The Republic of Seychelles is made up of 115 islands scattered over an Exclusive Economic Zone covering an area of 1,374,000 square kilometers. The total land area is 455 square kilometers (45,250 hectares). The islands are situated in the Western Indian Ocean between 4 degrees and 11 degrees south of the equator. Mahe is the main island and the seat of the Government. Forty-one islands are granitic and are all found within a radius of 50 km from the main granitic island of Mahe. With a land area of 148 square kilometers, Mahe amounts to one third of the total land area of the archipelago. The remaining 74 islands are all coralline. The furthestmost island from Mahe is Aldabra 1150 kilometers to the south.

The population of 68,600 (1987 Census) is concentrated on the three largest granitic island of Mahe (60,400), Praslin (5,600), and La Digue (1,900). The coralline islands support a population of 300 persons. 23,000 of the total population are under fifteen years of age, and Seychelles has recorded an average annual population growth rate of 0.8 percent. The average family size of Seychelles is about 5 people. Life expectancy at birth for women and men is estimated at 72 and 68 years, respectively. The Seychelles is predominantly a Christian country (99%); the main church is the Roman Catholic which covers 88.6% of the population. Of the 20,000 wage earners, a total of 2,300 are employed in the agricultural, forestry and fishing sectors, 3,300 in mining, manufacturing and construction, 2,500 in tourist related industries, and 7,500 in services.

In 1903, the Seychelles became a Crown Colony separate from Mauritius. It gained full independence in 1976 as a Republic. Creole, English and French are today the official national languages. The Government of Seychelles is headed by an elected President, with a cabinet of 10 Ministers having specific portfolio assignments.

1.1. STATUTORY BACKGROUND

The Republic of Seychelles deposited its instruments of accession to the Montreal Protocol in January 1993, which become enforceable in May 1993. Seychelles has also, since signed the London and Copenhagen Amendments to the Montreal Protocol. Seychelles is also party to the Vienna Convention on the Protection of the Ozone Layer.

After an initial assessment (June 1993), Seychelles determined its ODS consumption at 10.5 tonnes/year, which is approximately 0.15 kg/capita. Therefore, Seychelles as a

developing country is classified as an 'Article 5 Country' under Article 5 (1) of the Montreal Protocol. In pursuance to Article 7 of the Protocol, Seychelles has already submitted its first set of data to the Ozone Secretariat in September 1993. Seychelles is also in full compliance with Articles 2, 2A-E and Article 4 of the Protocol since it does not produce any ODS and all demand is met through imports.

In April 1993, a National Working Group for the Montreal Protocol was set up, with the Division of Environment as its secretariat. The Working Group consisted of representatives from the Ministry of Industry, Ministry of Foreign Affairs, Planning and Environment, Seychelles Fire Brigade, and the private sector. Since its inception the Working Group has organized a National Workshop on the Montreal Protocol, published numerous articles, TV-Audio presentations on the ozone layer and the Montreal Protocol, survey for the reporting of data, customs restrictions on ODS imports, preparation of policies and guidelines for certain projects. A computerized database of all participating agencies is now available to facilitate dissemination of information.

In September 1993, a private company (Cooling Plus Ltd.) brought in the first, and to date, the only refrigerant recovery system in Seychelles, and trials have shown that refrigerant recycling is a viable option for the Seychelles.

In November 1993, a Seychelles delegation attended the Fifth Meeting of the Parties to the Montreal Protocol in Thailand, through UNEP sponsorship. Substantial benefits were obtained from the meetings, especially in terms of the Montreal Protocol Implementation and aspects of Regional Cooperation. Procedures for the formulation of the Seychelles Country Program were initiated in December 1993. Seychelles has been awarded a grant of \$ 30,000 for the formulation of the Country Program.

1.3. PURPOSE

This Country Program reflects the commitment of the Government of Seychelles and forms the basis of action for the implementation of the Montreal Protocol Agreements, through private sector participation and concerted effort.

Although Seychelles is not a significant contributor to the depletion of the ozone layer, the Government and its people attest to its global importance and hence support the Protocol and all its amendments. As a sign of its continuing commitment to the Protocol, Seychelles has recently signed the Copenhagen Amendment, in an effort to hasten the phase-out timetable of the Protocol.

Monitoring of ozone in the Seychelles atmospheric region is being achieved by the Seychelles Meteorological Section. Of particular interest is the Hav-Dobson spectrometer for measuring radiant penetration, and hence ozone levels (one of the 142 centers in the world) and the NOAA/CMDL cooperative flask sampling network for methane measurements, which amongst developing countries is found only in the Seychelles and Barbados.

The Country Program provides the foundation for the development of an Action Plan for the effective phase-out of ODS. It primarily addresses the actual situation by an in-depth review of the latest data on consumption of ODS.

Within the Action Plan the study has identified six key projects which would form an integral part of the plan and would achieve the objectives within the Protocol Timetable. A detailed financial analysis for the projects has been presented for subsequent submission to the Executive Committee of the Multilateral Fund of the Montreal Protocol for which financial assistance will be sought.

Consistent with the Action Plan, a project has been identified which will consider the effectiveness of the Action Plan annually, and therefore propose an up-to date assessment of the status of implementation with guidance and recommendations for modification or improvement.

1.4. STATUS

The programming of the Montreal Protocol has been taken up by the Division of Environment, and it will continue to play a leading role in the formulation of the Country Program, implementation of the action plan and coordination of all projects identified within the framework of the plan.

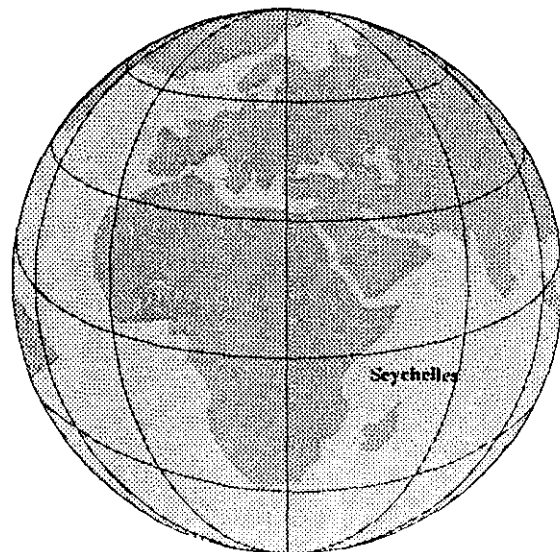
Following a survey and discussions by the National Working Group for the Montreal Protocol, the Government of Seychelles felt that though Government experts including those within the National Working Group were already overburdened with their respective work, there was enough expertise within the Republic to assist in the formulation of the Country Program. Government felt this would also build the indigenous institutional capacity of the country to conduct, program and implement the relevant environment policies and projects, and in the process establish a wider base of local constituencies and partners necessary for the understanding and support of such a complex issue. Following tender, ENVIRO, a local environment consultancy firm, was contracted to formulate the Country Program and to network and liaise with end users, importers and with the private sector refrigerant specialist firms, as well as with the Division of Environment as the coordinating and legal framework agency.

Costs for development of the Country Program was pledged by UNEP for a grant amounting to \$ 30,000. Out of this \$ 15,000 has been attributed to local consultancy fees for the production of the Program..

1.5. ASSISTANCE RECEIVED

The Division of Environment, Ministry of Foreign Affairs, Planning, and Environment, and the Seychelles Fire Brigade have contributed assistance in terms of technical services, communication and copying facilities.

Certain private sector enterprises, notably Cooling Plus Ltd., Topcool Ltd. and Liquid Air Ltd. have contributed information and technical services. John Elliott, M.Inst.R., with over twenty years of experience in the field was subcontracted to complete certain aspects of the country program.



Current Situation

2.1 CURRENT AND FORECAST CONSUMPTION OF ODSS

2.1.1 CURRENT CONSUMPTION

There are currently no production facilities of ODS in the Seychelles, and therefore all the ODS needed are being imported. A list of the main importers, including their supplier is given in figure 2.1. All imports were made from countries who are parties, or who have recently become party to the Montreal Protocol.

Figure 2.1 Importers of ODS in Seychelles

Supplier	Importer	ODS
APEX AGENCIES, UK	BODCO LTD.	R-11,12, 22, 502,
DUPONT	AIR LIQUID LTD.	Halon 1211
-not given	HIS	R-11,12, 22, 502
-not given	KIM KOON LTD.	R-11,12,22 and 502

The largest importer, Bodco Ltd. accounts for 40 % of the imports.

Figure 2.2 For comparative purposes the graph below describes the trend on ODSs consumption in the Seychelles from 1987 - 1993.

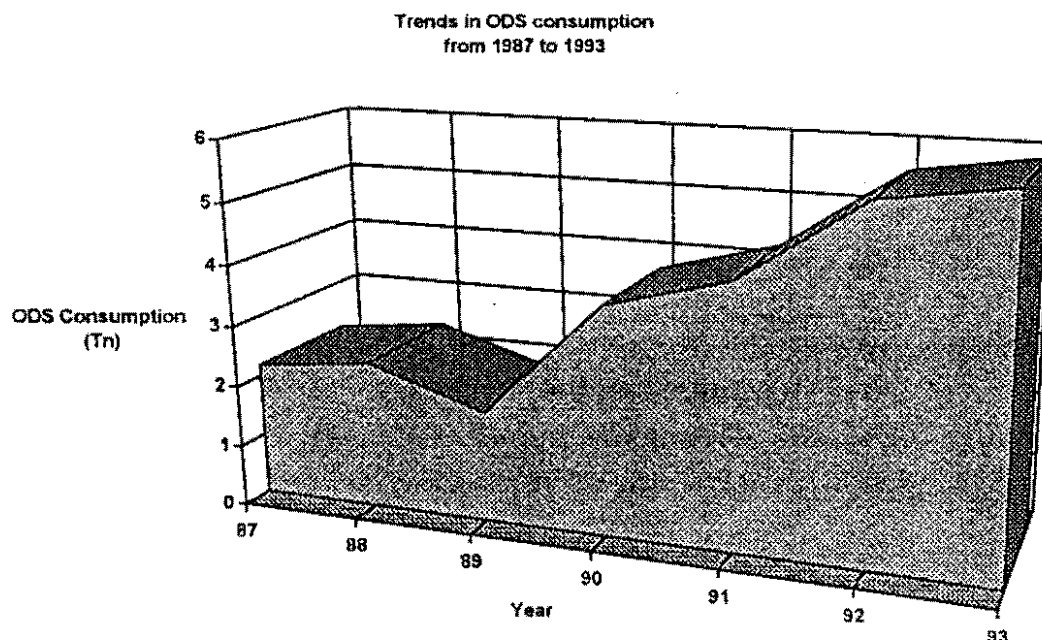


Table 2.1 The total amount of ODSs (in tonnes) consumed in Seychelles during the year 1991.

Source Tonnes Substance	Production	Imports ³	Exports	Consumption	ODP ¹	Consumption (ODP tonnes)
Annex A Group 1						
CFC 11	0	0.405	0	0.405	1.0	0.405
CFC 12	0	2.430	0	2.430	1.0	2.430
CFC 113	0	0	0	0	0.8	0
CFC 114	0	0	0	0	1.0	0
CFC 115 ²	0	1.140	0	1.140	0.34	0.388
Subtotal	0	3.975	0	3.975		3.223
Annex A Group 2						
Halon 1211	0	0.495	0	0.276	3.0	0.828
Halon 1301	0	0	0	0	10.0	0
Halon 2402	0	0	0	0	6.0	0
Subtotal	0	0.495	0	0.276		0.828
Annex B Group 1						
CFC 13	0	0	0	0	1.0	0
CFC 111	0	0	0	0	1.0	0
CFC 112	0	0	0	0	1.0	0
CFC 113	0	0	0	0	0.8	0
CFC 114	0	0	0	0	1.0	0
CFC 115	0	0	0	0	0.6	0
CFC 211	0	0	0	0	1.0	0
CFC 212	0	0	0	0	1.0	0
CFC 213	0	0	0	0	1.0	0
CFC 214	0	0	0	0	1.0	0
CFC 215	0	0	0	0	1.0	0
CFC 216	0	0	0	0	1.0	0
CFC 217	0	0	0	0	1.0	0
Annex B Group 2						
Carbon Tetrachloride	0	0	0	0	1.1	0
Annex B Group 3						
1,1,1-Trichloroethane	0	0	0	0	0.1	0
TOTAL				4.251		4.051

1. ODP = Ozone Depleting Potential; data derived from UNEP IE/PAC Refrigerants, 1992.

2. CFC 115 was estimated according to its constitution of 51.2 % in the blend R502, (48.8 % being HCFC-22) and the ODP thereof.

3. All import surplus are stored for use in the following year.

4. Source: MISD reports, Import data.

The local retail prices of ODS have increased drastically over the last five years. Local retail prices on major ODS in 1991 (in US\$/kg) is presented in Figure 2.3. Please note that the prices presented have been subjected to a 15 % wholesale mark-up, 25% trade tax, and 10 % retail mark-up. All ODS imported are subjected to the same trade tax.

Table 2.2 Retail prices of ODS in 1991 (in US\$/kg)

	R-11	R-12	R-502	R-22
1991	12	14.2	26.8	11.7

Historically, Seychelles has always used the SITC (United Nations Standard International Trade Classification) system of trade coding. However, since the outset of

1994, the more recognized system, the Harmonized Commodity Description and Coding System (HS) was introduced. This allows for more specific characterization of chemicals and products, and thus facilitates monitoring. All research performed made the use of the SITC coding system, but the equivalent HS code is provided to ensure clarity as shown below:

SITC	HS	Item
290351	511.3	Halogenated derivatives of Hydrocarbons

2.1.2. ODS USE

The most important sector of the Seychelles economy is tourism. Tourism contributes about 18% of GDP compared to agriculture, forestry and fishing which contributes 4%. As a result, the largest economic sector user of ODS is unsurprisingly the tourism sector and all its attendant industries, e.g. food producers, etc. The food chain is another important ODS user, based on cold storage facilities.

Figure 2.2 Percentage usage classification by major sector applications

ODS Consumption by Sector Applications in 1991

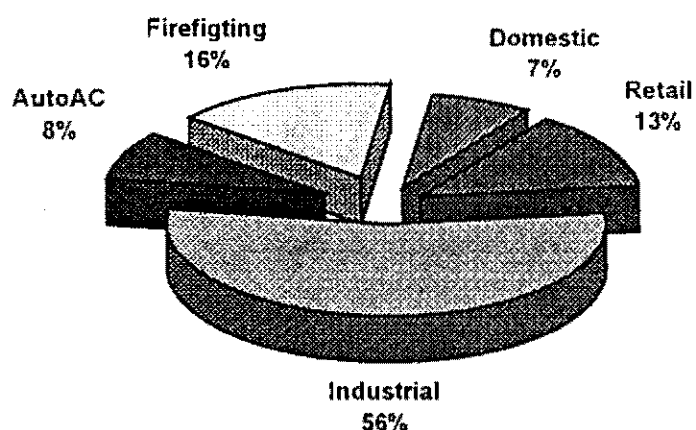


Figure 2.3 Percentage usage classification by Economic Sectors.

ODS Consumption by Economic Sector in 1991

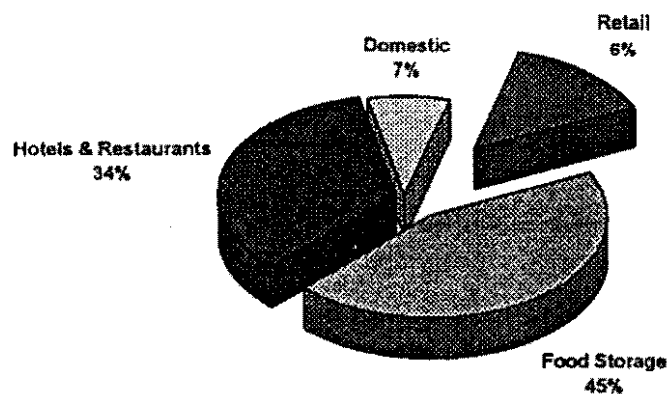


Table 2.3 Table showing Consumption of ODS by User Sector and Applications

User Sector	Substance	Application	Consumption (ODP tonnes)
Refrigeration			
Domestic	R12	recharging	0.150
	R11	purging/washing	0.180
Retail	R12	recharging	0.270
	R11	purging/washing	0.205
Chillers	R502 (R-115)	recharging	0.004
Cold Store	R502 (R-115)	recharging	0.365
	R12	recharging	1.700
Shipping	R-22	recharging (export)	-
Air Conditioning			
Comfort ACs	R22	recharging	-
Automotive ACs	R12	recharging	0.420
Fire Fighting			
All Sectors	Halon 1211	Recharging	0.828
Recycled/Recovered			
Refrigeration	R12	Reused for recharging	0.150 ¹
Cold Stores	R502	Reused for recharging	not available
Total Net ODP Tonnes			4.122

1. Quantity of all recovered & recycled ODS are not reflected in the final ODP-weighted consumption.

2. Source: ENVIRO surveys, Sales data.

A. Refrigeration Sector

The different sub-sectors within the refrigeration sectors is shown in table 2.4.

Table 2.4 Table showing the refrigeration sub-sector in Seychelles

User Sub-Sector	Examples
Domestic	Refrigerators, Deep freezers
Retail	Display cabinets
Cold Storage	Commercial Chillers
Shipping	Cargo Refrigeration, Refrigerated Reefers
Industrial	Beverage, food processing industries
Medical	Blood Banks, Mortuary, Drug Storage

1. Domestic Refrigeration

Refrigerators for domestic use in the Seychelles have always been imported, mainly from Europe and Asia. The total number of domestic refrigerator units in the Seychelles used in the home was estimated (using population data) to be about 15,000 units.

During the survey, it was found that quite a number of small refrigerator units are being used in the rooms of large hotels, a total amounting to about 500 units.

Similar units but larger were found to be extensively used in the 75 restaurants found on Mahe. The amount of these types of refrigerators used in restaurants were estimated to be 225.

A comparison based on import trends of domestic refrigerator units show that fairly constant amounts of domestic refrigerator units are imported every year (Table 2.5). Units imported for use in all three economic sectors have an average charge of 200 g (in contrast to 154 g/unit for Africa as suggested by the Montreal Protocol Technical Options Committee Report).

Table 2.5 Domestic Refrigerators imported into Seychelles, period 1981-1991.

Year	Units Imported
1981	2,173
1983	1,589
1985	1,668
1987	1,283
1990	2,005
1991	1,201

Source : Trade Reports, 1980-1991; ENVIRO Surveys.

Domestic deep freezer units are also used by the domestic, hotel and restaurant sector.

Estimates show that there could be around 5,000 to 6,000 deep freezer units used in the homes. This is used mainly to store fish for the seasonal scarcity of this commodity in the Seychelles.

Table 2.6 Population units in 1991

Sector	Domestic Refrigerator Unit	Domestic Deep Freezer
Domestic (Home)	15,000	5,000 - 6,000
Hotels	500	1,200
Restaurants	225	100

Refrigerators and deep freezers tailored for domestic use utilises R-12 refrigerant and have an estimated life-time of about 10 years. Due to extreme tropical conditions, electricity fluctuations and interruptions, and high susceptibility to corrosion, their normal lifetime can be significantly reduced. A total of 10 companies are specialised in refrigeration repair in the Seychelles, and some 30 other companies are involved in refrigeration repair as part of their normal machine and electrical services.. Although, most of the companies are very small, it is estimated that an average of 150 kg of R-12 and 180 kg R-11 is utilised every year, assuming an average recharge norm of 200 g per unit. In all cases, the gases are allowed to escape into the atmosphere, then leak tested and washed using R-11, and finally recharged with virgin R-12. Only one small reclaim facility exists to date, however no refrigerants used in domestic refrigerators or deep freezers have been recovered. Refrigerator scraping has been estimated at about 540 units per year. It is expected that a lot of the CFC discharges can be significantly reduced through proper training in preventive maintenance, leak testing, recharging and disposal facilities.

2. Retail Refrigeration

There are at least 352 small retailers situated all around the main island Mahe. However, there are very few large supermarkets and they are mainly centered in the city and in suburban areas. Small retailers make the use of domestic refrigerators and freezers which is charged with R12. The use of small retail refrigerated displays is not widely used. A total of 300 refrigerator units, 700 deep freezers and about 2 small refrigerated displays were accounted for in the survey of small retail shops. These units have an estimated lifetime of about 7 years.

Large supermarkets make the use of much larger refrigeration facilities, especially large refrigerated display cabinets and island freezers.

Table 2.7 Population of Units in 1991

Supermarket	No. Display Cabinets	Display refrigerators	Island freezers
SMB SM	12	7	13
Temooljee SM	0	2	10
Krisna Mart	0	2	4
Continental Store	0	2	5
Quincy Super	0	2	4
Bridge SM	0	2	3
Adeline SM	0	2	6
Francois SM	2	2	4
Chez Deenu Ltd.	0	2	3
Total	14	23	52
ODS	R12	R12	R12 (47), R502 (5)

*Source : ENVIRO Surveys; Seychelles Licensing Authority.
SM = Super Market; SMB = Seychelles Marketing Board.

This type of refrigeration equipment has an estimated lifetime of about 10 years. With a average recharge norm. of about 400 g for display cabinets, 500 g for display refrigerators and 900 g for the island freezers, it is estimated that ODS consumption for this sector is 270 kg R-12, 205 kg R-11 and 1 kg R-502 (0.51 kg R-115) for the year 1991.

3. Industrial Cold Storage

Cold stores in the Seychelles are mainly used in the tourism sector, since certain food products, e.g. fish are not always available due to seasonal changes. Most of the cold stores in Seychelles use the R-502 (R-115). These cold stores have an estimated lifetime of about 10 years. The average recharge norm for these large plants vary from 5 to 20 kg/unit and is thus the largest sector of ODS consumption in the Seychelles. It is estimated that the sector consumed about 1,700 kg R-12, 2,100 kg R-502 (1,075 kg R-115) in 1991. Other industries in the Seychelles use ammonia as their primary refrigerant.

Table 2.8 Population of Units in 1991

Company	No. of Cold-Stores	ODS Used
SMB-Meat Division	15	R-502
SMB-Fish Division	4	R-502
	3	R-12
	7	R-22
SMB Foodpro	4	R-12
	3	R-502
Hotels	35	R-12
	95	R-502
SkyChef	14	R-502
Seychelles Breweries Ltd.	4	R-502
Dominion Traders	2	R-12
Delite Ice-cream	1	R-502
Steve Ice-cream	1	R-12
Victoria Hospital	4	R-12

Source : ENVIRO Surveys.

4. Shipping Refrigeration

As Seychelles is a small island state, the most important transport modes are shipping and air freight. A total of 123 foreign cargo vessels delivered, transshipped and loaded cargo at the Seychelles Commercial Port in 1991, and often there is a need for refrigerants, especially by cargo vessels freighting foodstuffs. In addition, the fisheries industry in the Seychelles attracts scores of foreign fishing vessels (440 fishing vessels for the year 1991) and huge refrigerated vessels (94 reefer vessels for the year 1991) to the Fishing Port. However, most of these refrigerated vessels use ammonia as the refrigerant. A total of 1669 kg of R22 was utilised in 1991 by the Shipping Sector, for recharging . Since R-22 is not yet a controlled substance within the framework of this country program the discussion would be brief.

Table 2.9 Use of R-22 in the Shipping Sector

Application Area	R-22 Use (kg)*
Cargo Vessels	549
Fishing Vessels (about 40%)	1120
Total	1669

*1991 data Source : Statistical Abstract 1991; Supplier sales figures; Port and Marine Authority.

At present the Seychelles International Airport has access to facilities to conduct maintenance on the refrigeration and air-conditioning systems of commercial airplanes and cargo planes. The Air Seychelles Company Ltd. owns a fleet of inter island planes,

but these are not equipped with either refrigeration or air-conditioning facilities. In conclusion, to date there has been no controlled ODS consumption within this sector.

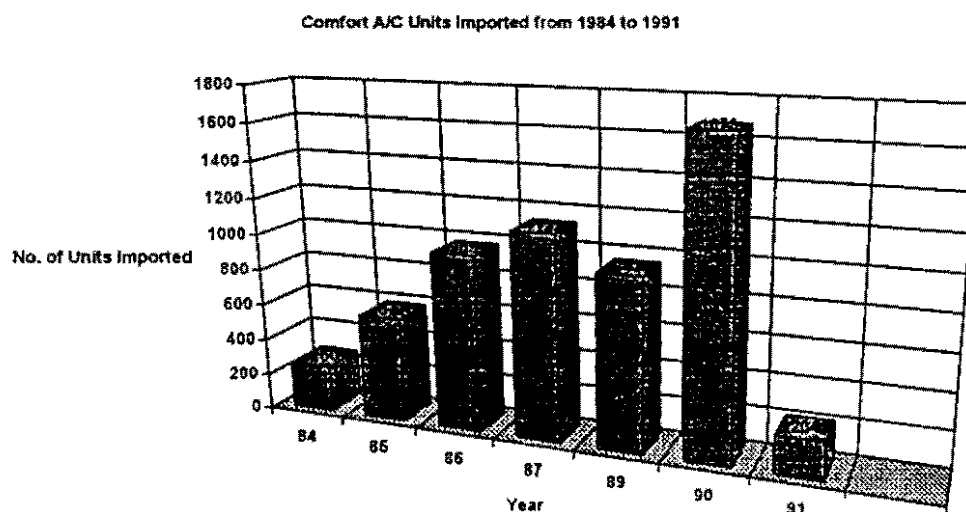
B. Air Conditioning

1. Comfort Unitary ACs

In Seychelles most Hotels, Government offices and private office buildings are equipped with an air-conditioning system. With the exception of a few hotels and office buildings, most of the air-conditioning systems are of the 'through the wall' type and split unit systems. From statistical information and a grab survey it was estimated that there is a total of 2,450 units used in the tourism sector, 5,120 units used in office buildings. The survey included air-conditioning units used domestically, about 103 units.

The working refrigerant is R-22 and consumption is estimated at 1.53 tonnes for the year 1991. Usually, those systems are properly maintained, although with a very low lifetime of 7 years. Air-conditioning installations are very sensitive to saline conditions and thus rust problems develop rather quickly. In most cases a full recharge of about 1 kg/unit is required during repair. Increases in the tourism industry during the years of 1985 - 1990 illustrates the use of air conditioning systems as an important facility in the tourism sector.

Figure 2.4 Current trends in the importation of air-conditioning systems in Seychelles



have a life-time of more than ten years. Since there were no facilities for reclaim in 1991, these units had to be fully recharged during repair. It is estimated that R-22 consumption for this sector is 1,200 kg.

Table 2.12 Survey of Industrial A/C Units

Sector	No. of Industrial A/C Units	ODS Used
Victoria Hospital	7	R-22
Office Buildings	4	R-22
Hotels	3	R-22
Industry	1	R-22

C. Foam

Only one company, BODCO Ltd. is involved in polyurethane foam production in the Seychelles, other types being met through imports. The company started production in 1993. The manufacturing process does not involve the use or the production of ODS.

D. Solvents

There are no electronic manufacturing, solvent production, etc. plants in the Seychelles, therefore there is no large scale use of solvents. Certain halogenated solvents are used in maintenance and cleaning of precision and sensitive equipment, and they are all imported as consumer products on an extremely low scale. Substitutes would be used as soon as economic alternatives reach the market.

E. Fire Fighting

All ODS used in fire fighting are imported through one agent, Air Liquid Ltd. A detailed survey of all establishments was done to establish the amount and distribution of halon fire-fighting equipment.

There are only two fixed halon systems, using Halon 1301, in the Seychelles, one by the Cable & Wireless Central Communications Facility (2,249 kg) and the other in a computer room in a multi-office building (250 kg). However, the later has been abandoned although the halon is still present. There was in 1991, and has to date been no consumption (i.e. as a result recharges) of Halon 1301 in the Seychelles since both

installations have never been used or tested. It is proposed that a small bank is setup from the abandoned Halon 1301 present in the multi-office building to sustain the one currently present at Cable & Wireless Ltd. Cable & Wireless Limited is planning to replace the existing system with a more appropriate system in the near future.

Only the Halon 1211 portable type is extensively used, with weights ranging from 0.7 to 7.9 kg, but 1.5 kg being the most common. The total number of halon 1211 portable units is 900 which represents an amount of 2459.5 kg of halon 1211. Figure 2.14 shows the use of halon by sector in 1991 (determined from import data and estimated by considering sector usage).

Table 2.13 Halon use by Sector in 1991

Sector	Total in Portable Units (kg)	Consumption (kg) (1991)
Shops	413.0	46.3
Industry	591.4	66.4
Hotels/Restaurants	673.6	75.6
Offices (Computer & Medical Equipment)	462.0	51.8
Domestic	209.5	23.4
Other (inc. Military)	110.0	12.4
Total	2459.5	276

Source : Seychelles Fire Brigade Survey and sales information.

By far, the largest user of halon 1211 are the hotels and restaurants, at least 31% of the total halon 1211 usage. Essential applications require special mention as they constitute almost 22% (Offices & Other) of the total halon 1211 consumption in the Seychelles. Consumption of halon 1211 is fire extinguisher recharge. Due to high humidity and proximity to the sea, the lifetime of conventional fire extinguishers are substantially reduced to about 5 years, therefore imposing a greater requirement for recharge and routine inspection. Since the beginning of 1994, the importation of halon 1211 has been completely restricted. During the year 1993, the Seychelles Fire Brigade (SFB) performed an exhaustive survey of all establishments and has since stopped recommending halon-based fire extinguishing systems. In addition, the SFB has determined that almost 80% of the halon 1211 usage will decrease over the next two years. Establishments with special requirement and essential use requirements have already been identified by the SFB and further preventive measures are being implemented.

F. Recycling & Recovery

At present only one company, Cooling Plus Ltd. has been involved in the recycling of refrigerants in the Seychelles. This has been done only on a pilot scale. Equipment was acquired at a cost of \$ 15,000, included two small reclaim units, accessories and storage cylinders. The company, although offering its recycling services to the public, is currently only involved in maintaining the systems of its clients.

Since the inception of this service, Cooling Plus Ltd. has successfully recovered on excess of 150 kg of refrigerants from various equipment. This reclaim has, in general been done during repair and maintenance work whereby in the past the refrigerant would have been vented to the atmosphere. Due to lack of proper standards, regulations and public incentives very little refrigerant has been reclaimed.

G. Aerosols

All aerosol products are derived through imports and therefore this sector is transient in all aspects. Most aerosol products are for use as a propellant in cosmetics, precision cleaning, medical purposed products and to a lesser extent in pest control. In an effort to reduce the consumption of aerosol products containing ozone depleting substances the Government, as from January 1994, introduced special permits and imposed a tax of 200 % to discourage the use of ODS-containing aerosols. Products which have the manufacturers guarantee they are ozone free are taxed at only 40%.

Table 2.14 Summary of ODS consumption from 1987 - 1992 (in metric tonnes)

Sector	1987	1988	1989	1990	1991	1992
Domestic Refrigeration						
CFC-12	0.085	0.073	0.037	0.150	0.150	0.170
CFC-11	0.335	0.269	0.224	0.140	0.200	0.299
Retail Refrigeration						
CFC-12	0.157	0.135	0.0675	0.269	0.270	0.315
CFC-11	0.558	0.449	0.375	0.249	0.205	0.499
R-502	0.0021	0.0031	0.0042	0.0063	0.011	0.017
Industrial Cold Storage						
R-502	0.205	0.307	0.425	1.710	1.075	1.638
CFC-12	0.991	0.509	0.105	0.400	1.700	1.982
Automotive A/C						
R12	0.245	0.210	0.105	0.400	0.420	0.490
Halon 1211	0.151	0.150	0.163	0.250	0.276	0.276

Source : ENVIRO Surveys; MISD Trade Reports; MISD Statistical Abstracts.

2.2 FORECAST CONSUMPTION

2.2.1 Basic Assumptions

Forecasts of ODS consumption by sector was performed based on two assumptions as proposed in the terms of reference.

- Assumption #1 : No attempt is made to comply with the Protocol.
 Assumption #2 : Unconstrained quantities of controlled substances continue to be available from existing sources, at current prices.

In addition, the following assumptions have also been made :

- Assumption #3: Population projections are subject to other related assumptions.
 Assumption #4: That the current GDP and rate of development remains unchanged.
 Assumption #5: Tourism projections are subject to other related assumptions.
 Assumption #6: Unconstrained availability of current technology from existing sources and at current prices.

The forecasting approach was based on several existing factors, linear regression and consideration of available statistical information. The computer software MINITAB™ was utilised in the formulation of the linear correlation equations and the subsequent forecast. It is important to note at this point that since Seychelles depends exclusively on imports, assumptions based on availability of both ODS and technology is important as they will directly influence ODS consumption in the Seychelles. Impacts of new technology and ODS will be considered under the discussion for Phase-Out schedules and action plan.

The following criteria were adopted for the forecasting :

- ☐ Population projections as proposed by the Management & Information Systems Division, data based on family units were also used.
- ☐ Tourism projections as proposed by the Management & Information Systems Division. Tourism is the biggest economic sector in the Seychelles (1 Seychellois: 1.3 tourist/year).
- ☐ Past trends in consumption of ODS in Seychelles. This depended upon demand in the repair industry, as there is no consumption in manufacture, etc.

Projections for the future demand on ODS in the Seychelles was then performed. A summary of all users of ODS in the Seychelles is presented in Figure 2.16, after which a discussions on specific forecasts by sector is presented.

Table 2.15 Table showing Consumption of ODS in 1991 by User Sector and Applications

User Sector	Substance	Total Units	Consumption (ODP tonnes)
Refrigeration			
Domestic	R12	23025	0.15
Retail	R12	1086	0.27
	R502	5	0.004
Industrial Cold Storage	R12	56	1.7
	R502	98	0.365
Air Conditioning			
Automotive ACs	R12	2274	0.42
Industrial ACs	R-22	not required	not required
Fire Fighting			
All Sectors	Halon 1211	900	0.828

2.2.2. ANNEX A Group 1

CFC-11

CFC-11 is only used to cleaning and purging compressors in the Seychelles in the domestic and retail refrigeration sector. Forecasts were based on actual forecasts of demand of domestic and retail refrigeration until the year 2012.

CFC-12

Industrial, Domestic and Retail Refrigeration

Use of CFC-12 in the industrial cold store sector is very extensive. Forecasts for consumption were also combined with that of domestic refrigeration, as these are closely associated. The unconstrained demand for domestic refrigerators in the Seychelles is expected to be dependent on three important factors :

- ☐ increase in the population.
- ☐ extent of tourism development.

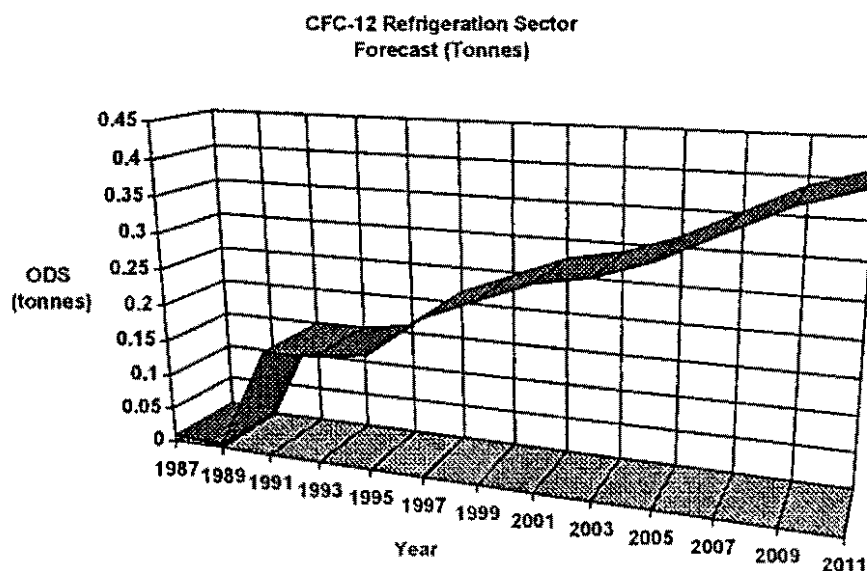
- ❑ refrigerator scrapping, which is about 540 per year (estimated from scrap metal figures) . Cold store scrapping virtually non-accountable on a year to year basis.
- ❑ average lifetime of a refrigerator was found to be 10 years
- ❑ current import trends of ODS in Seychelles.

The computed consumption of CFC-12 in the refrigeration sector is presented below :

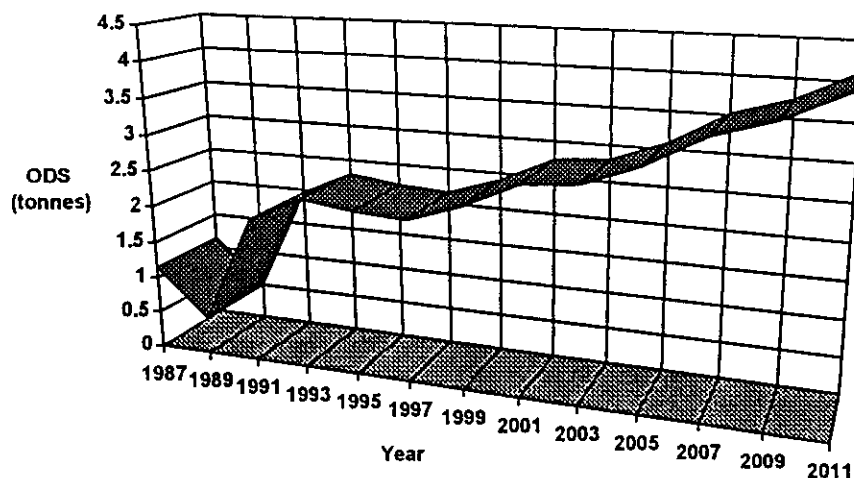
Regression Equation performed on 3 predictors (population, tourism, current import trends). Population and tourism projection figures was available only for the year 1997, 2002, 2007 and 2012.

$$\text{ODS(CFC-12) Consumption} = 290478 - (156 * \text{Year}) + (0.291 * \text{Pop.}) + (0.00729 * \text{Tourist})$$

The forecast shows that there is an increase of 0.0658 tonnes from 1991 to 1997, and increases further from 1997 till 2011 by 0.196 tonnes to a total consumption of 0.4365 tonnes in 2011.



CFC-12 Industrial Cold Storage Sector
Forecast (Tonnes)



The forecast for CFC-12 consumption in the industrial cold stores shows that consumption will effectively double from 1991 till 2011. A total of 4.12 tonnes is forecasted for the year 2011.

Due to the difficulties associated in obtaining a good estimate on use of domestic deep freezers, it is expected that the trend would increase by 10 % every year, as more and more Seychellois can afford deep freezers. As mentioned before deep freezers are used to store food during seasons of no fish, and also due to changing patterns of life.

Automotive Air-conditioning units

The amount of cars imported into Seychelles has risen considerably over the last few years, and therefore the unconstrained demand for CFC-12 in this sector was calculated by considering the future demand for car A/Cs. The following basic assumption was considered :

Assumption #1 Current prices and availability of fuel remains constant.

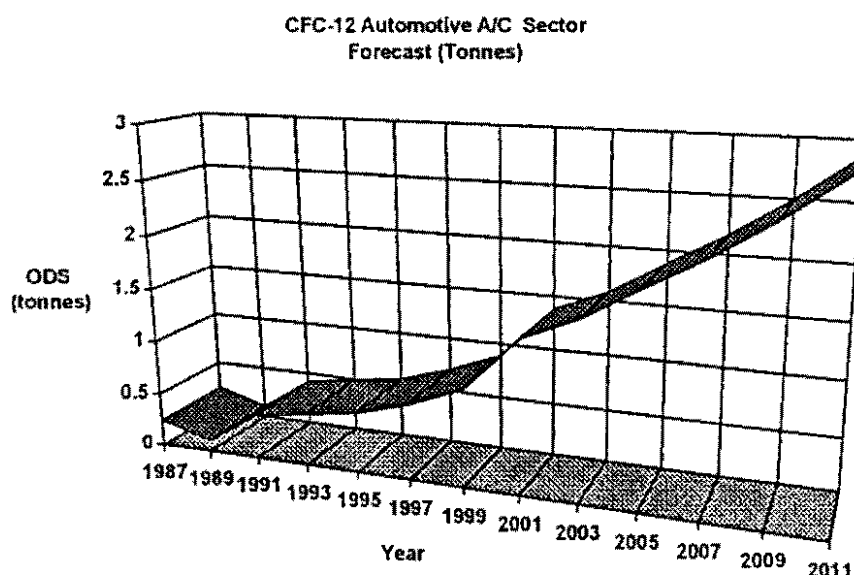
The following factors were also considered :

- ❑ demand on CFC-12 Auto A/Cs would increase as a function of the importation and scrapping rates. (In the unconstrained demand it is assumed that car manufacturers do not turn to other to other alternatives, e.g. R-134a, as Seychelles is very sensitive to availability for imports).
- ❑ the estimated life-time of a car A/C to be 10 years.
- ❑ a recharge norm. of 1.5 kg/unit.

The computed consumption of CFC-12 by the automotive A/C sector is presented below:

Regression Equation performed on 2 predictors (population, current import trends).

$$\text{ODS(CFC-12) Consumption} = 26647 - (19 * \text{Year}) + (0.169 * \text{Pop.})$$



From 1991 onwards it is forecast that the consumption of CFC-12 in this sector will rise from 0.42 tonnes in 1991 to 2.17 tonnes in 2007. This represents more than a four-fold increase in consumption. The total consumption forecast for the year 2011 is 2.868 tonnes. These projections hold true without considering that R134a is already being used for new commercial applications and in retrofitting to R134a or R22 where practical and economically viable.

CFC-115

Industrial Cold Storage

Used as a blend in R-502, the main sector is in the industrial cold storage. The ratio amount of R-502 cold stores to CFC-12 cold stores (currently 1.75: 1) is increasing. The following factors were taken into consideration :

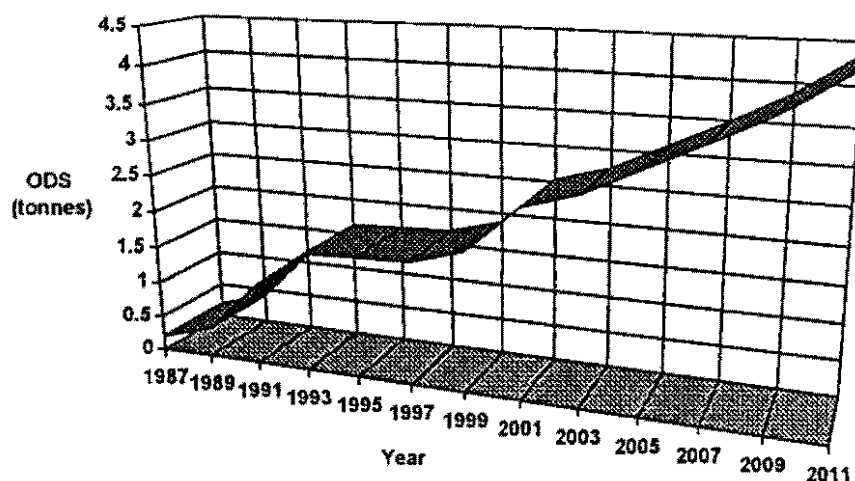
- ☐ demand on R-502 cold rooms in the near future continue to increase by 5% (derived from past trend ratios).
- ☐ Estimated life-time of 10 years.
- ☐ Scrap rate could not be accounted for as there is so few units.
- ☐ Average charge is 7.5 kg

The computed consumption of R-502 in the industrial cold storage sector is presented below :

Regression Equation performed on 3 predictors (population, tourism, current import trends).

$$\text{ODS(CFC-115) Consumption} = 100873 - (31 * \text{Year}) - (0588 * \text{Pop.}) + (0.0056 * \text{Tourist})$$

CFC-115 Industrial Cold Storage Sector
Forecast (Tonnes)



The forecasts for CFC-115 consumption in this sector shows that consumption will increase sharply from 1.126 tonnes in 1991 to 4.365 tonnes by 2011. This increase is strongly correlated to the projected growth of tourism in Seychelles. Projections for R-502 consumption in Seychelles does not reflect the use of new technologies or retrofitting of existing systems.

2.2.3. ANNEX A Group II substances

Halon 1211

The only sector using halon 1211 is in fire prevention. The consumption of halons is only for recharge of empty fire extinguishers. The unconstrained demand on ODS consumption in this sector is governed by the following factors :

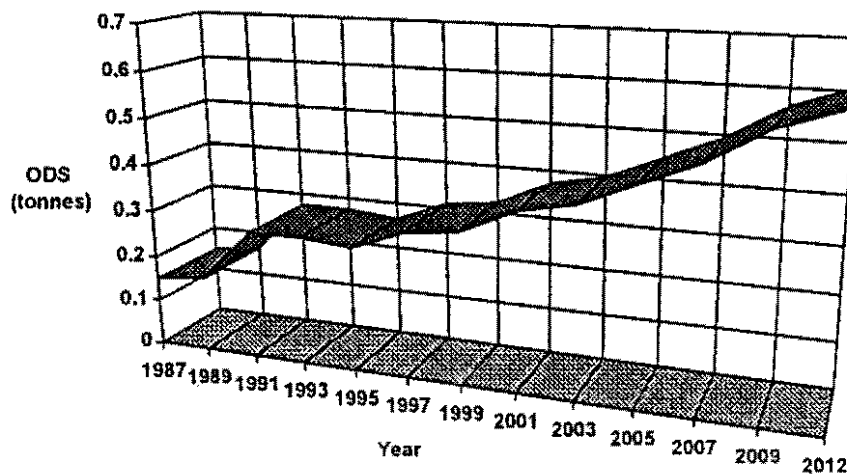
- ☐ life span of about 5 years.
- ☐ dependent upon the number of establishments set-up (estimated at a rate of 5 per year requiring at least 10 fire extinguishers).

The computed consumption of Halon 1211 in this sector is presented below :

Regression Equation performed on 2 predictors (population, current import trends).

$$\text{ODS(H-1211) Consumption} = 36088 - (17.2 * \text{Year}) - (0.0295 * \text{Pop.})$$

Halon 1211 Fire Extinguisher Sector
Forecast (Tonnes)



The forecasts performed for the halon sector, shows that under unconstrained demand the consumption of Halon 1211 would increase from 1991 to 2011, by 0.331 tonnes.

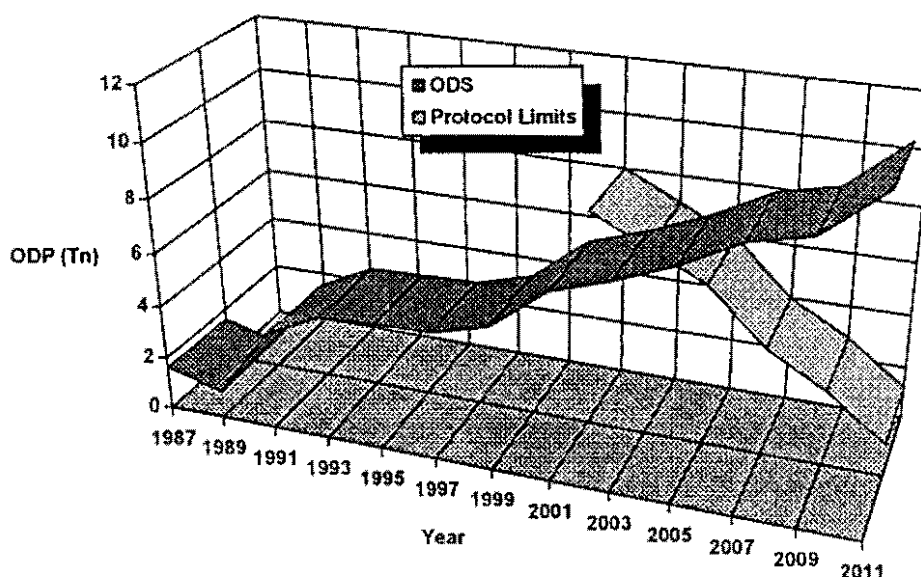
2.2.4. Summary of Forecasts

ANNEX A Group I

Seychelles imports and consumes only R-11, R-12, and R-115 in ANNEX A Group I of the protocol. As shown, the demand for CFC-12 in the year 2001 will be 6.938 tonnes, and in the year 2011, 11.765 tonnes. This is almost a two-fold increase in CFC-12 consumption over 10 years.

Year	87	89	91	93	95	97	99	01	03	05	07	09	11
ODS	1.6045	1.0097	3.6664	4.6384	4.713	4.77	5.34	6.938	7.612	8.45	9.544	10.01	11.765
Limit								8	7	6	4	2.8	1.2

Forecast Schedule of ODS in ANNEX A Group I

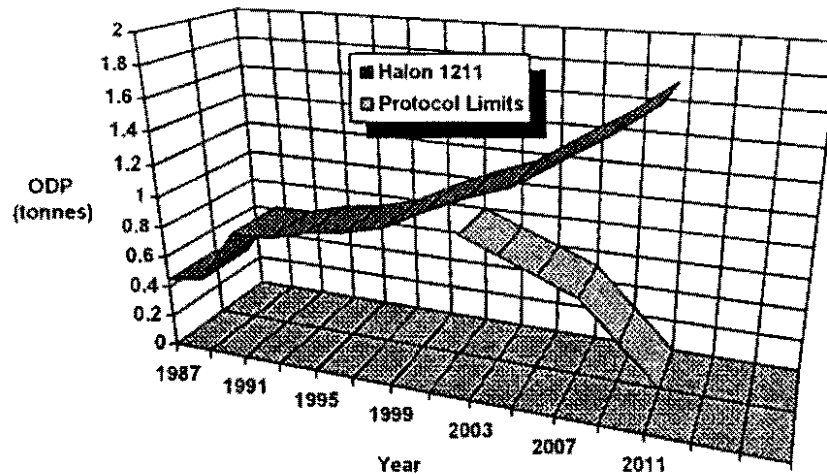


ANNEX A Group II

Seychelles imports and consumes only Halon 1211 in ANNEX A Group II of the protocol. Forecasts for this group is given in figure. The unconstrained forecast consumption for Halon 1211 in this group shows that in 2002, the consumption will be 1.126 ODP tonnes and in 2012, 1.821 ODP tonnes. The limits of the Montreal Protocol is included for comparative analysis.

Year	1987	1989	1991	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011
Halon	0.45	0.489	0.828	0.828	0.895	0.93	0.997	1.126	1.234	1.325	1.485	1.634	1.821
Limit								0.8	0.7	0.6	0.5	0.25	0

Forecast schedule for ODS in ANNEX A Group II (ODP Tns)



In conclusion, the following table provides a basis for the categorization of Seychelles as an Article 5 country under the Montreal Protocol. The criteria used is that the per capita consumption should be lower than 0.3 kg per capita as stipulated by the Montreal Protocol.

Table 2.16 Per Capita Consumption in view of Article 5.

Year	ODS Consumption (ODP tonnes)	Per Capita Consumption*(kg)	Article 5 Country
1987	2.598	0.0398	✓
1991	4.051	0.0603	✓
2002	6.9621	0.0897	✓
2012	11.7781	0.135	✓

*Based on population figures: 1987 = 68,499; 1991 = 70,438; 2002 = 81,496 (projected); 2012 = 91,419 (projected).
Source: Statistical Bulletin, 1992.

2.3. INDUSTRY STRUCTURE

An outline of the structure and ownership of companies importing and using ODS in the Seychelles is discussed in this Section. Seychelles does not produce or manufacture any ODS. Importers of ODS as chemicals in 1991 is already shown in Table 2.1.

2.3.1. Users of ODS in the Seychelles

Users of ODS in Seychelles are mainly companies, and therefore it was possible to obtain concrete data on consumption and nature of use. All companies in the Seychelles require a licence from the Seychelles Licensing Authority to operate. However, there are some companies which lack proper equipment and have poorly trained staff. As a result, there is often inconsistencies in the quality of service and alledged wastage of ODS. A list of users of ODS in the Seychelles is given in figure 2.17, overleaf.

2.3.2. Institutional Framework

An ODS reduction program requires sufficient cooperation between government, the private sector, NGOs, and other groups in industry and the consumer sector. The institutional framework for such cooperations have already started to unfold in the Seychelles. However, a more organised approach needs addressing. The leading agency is the Division of Environment, Ministry of Foreign Affairs, Planning and Environment.

A. Government Bodies

1. Ministry of Foreign Affairs, Planning and Environment

Division of Foreign Affairs

Bilateral relations between DOE and its sister Division of External Relations within the Ministry concern the coordination of policies and objectives for international conventions related to environmental protection and more specifically conventions related to climate change and the ozone layer. Seychelles is now party to at least twenty international conventions, and is currently playing a leading role in aspects of hazardous wastes

Table 2.17 Outline of Industry Structure, Ownership and usage of ODS

Substance	Usage	Company	Ownership	Current (1991) Annual Use (tonnes)	Type of Service
Halon 1211	Extinguisher recharge	Air Liquide	Private	0.276	Recharge facilities
CFC-11	Flushing and washing compressors	All refrigeration companies.	Private	0.405	Maintenance and repair.
CFC-12	AC and Cold Store recharge	Cooling Plus Ltd.	Private	0.041	Specialised maintenance and reclaim facilities
	AC and Cold store recharge	Top Cool Ltd	Private	0.097	Specialised maintenance facilities
	AC and cold store recharge	HIS Ltd	Private	0.262	Specialised maintenance facilities
	AC and refrigerator recharge	Poussou Ref. Works	Private	0.36	Specialised maintenance facilities
	Refrigerator and cold store recharge	SMB	Government	0.85	General maintenance facilities.
	Refrigerator recharge	Over 30 small companies	Private	0.37	General maintenance facilities.
R-502	Servicing of Cold Stores	Cooling Plus Ltd.	Private	0.049	Specialised maintenance and reclaim facilities
	Servicing of Cold Stores	Top Cool Ltd	Private	0.152	Specialised maintenance facilities
	Servicing of Cold Stores	HIS Ltd	Private	0.392	Specialised maintenance facilities
	Servicing of Cold Stores	Poussou Ref. Works	Private	0.312	Specialised maintenance facilities
	Servicing of Cold Stores	SMB	Government	1.430	Specialised maintenance facilities.

control, ozone protection and climate change. This implies that the Division of Environment contributes environment expertise towards elaboration of texts and conducting of international negotiations.

Division of Planning and Economic Cooperation

The Division of Planning and Economic Cooperation in the Ministry contributes environmental planning towards projects. This is conducted under the perspective of:

1. Administration of foreign assistance for implementation of the EMPS and other projects.
2. Monitoring the implementation of the EMPS and other projects

The Division of Environment

The institutional framework for environmental protection and improvement in Seychelles was streamlined and strengthened in June 1989 with the creation of the Department of Environment, under the Office of the President. This creation expressed the will of the Seychelles Government to pass from the old concept of environmental protection understood in the narrow sense of nature conservation, to the modern acceptance of the term, which encompasses the preservation and optimum management of land, ecosystems and natural resources. The Department of Environment was set-up to achieve the following main policy goals:

- ☐ To protect the health and quality of life for all.
- ☐ To ensure that future economic development proceeds on an equitable and sustainable basis.
- ☐ To improve our decision-making, laws and institutional framework for sustainable development.
- ☐ To increase public information and understanding of the essential linkages between environment and development.

The DoE is currently involved in reviewing its current Environmental Protection Act (1988) and the final draft has already been presented for discussion in the General Assembly of Seychelles and specific provisions have been made for the implementation of the Montreal Protocol directives. The Division of Environment has been involved with

the cooperation of the Ministry of Foreign Affairs to ratify all the agreements and amendments to the Montreal Protocol.

A national task force called the National Working Group for the Montreal Protocol , NWGMP, has been set up to implement the agreements of the Montreal Protocol, and the Environment Assessment and Pollution Control Section to function as the national secretariat for the Montreal Protocol. In that respect the Section of Environment Assessment and Pollution Control acts in the capacity as the main Coordinating and Advisory Body, through its recommendations to the Ministry of Industry, Ministry of Community Development, the Ministry of Finance, the Attorney Generals Office and the Private Sector.

The Environmental Management Plan of the Seychelles 1990-2000 (EMPS)

"Of special and growing concern to us is the implications of climate change and possible sea level rise....." Seychelles proposes to join Kenya, Mauritius and Tanzania in the recently created Eastern African Task Force on the Implications of Climate Change." (EMPS 11-43)

Multilateral Mechanisms

Council of Ministers

The council is the executive decision and policy making authority in the Government of Seychelles. All projects must be submitted to the council in the form of a project memorandum for approval.

Environment Steering Committee

This is an inter-ministerial committee which was specifically set-up to look and study prevailing environmental issues, as well as follow-up on the implementation of the EMPS 1990-2000. The Montreal Protocol has been introduced as a regular item on the agenda of the ESC as from January 1994.

2. Bilateral Intergovernmental Mechanisms

The Ministry of Industry

The Ministry of industry was set-up to coordinate, plan and monitor industrial development in the Seychelles. Its main roles are to :

- ☐ Provide Technological Support Services
- ☐ Promote the use of local materials
- ☐ Promote appropriate technologies
- ☐ Provide scientific and industrial support
- ☐ Maintain laboratory facilities
- ☐ Implement the energy development plan
- ☐ Promote energy conservation
- ☐ Provide industrial planning and management guidelines.

Seychelles Industrial Development Corporation

The function of the Seychelles Industrial Development Corporation, a body corporate established under the Seychelles Industrial Development Corporation Act 11/1988, is to:

- ☐ develop and manage industrial development zone;
- ☐ construct and manage buildings for industrial and commercial purposes;
- ☐ promote investment in industry;
- ☐ invest in industry.

The Ministry of Finance

The Ministry of Finance is already playing a significant role in enable the Government of Seychelles to control imports of ODS.

In January 1994, under the revised Trade Tax Regulations 1992, the Ministry of Finance has restricted all importation of ODS into the Seychelles. The importation of halons is no longer permitted. The Ministry of Finance has also set certain financial incentives which would foster a rapid phase-out of ODS consumption in Seychelles. For example, all aerosols imported into Seychelles which contain CFCs will attract a 200% duty, whereas those with no ODS will only attract 40% duty.

The Attorney General Office

The AGO is specifically involved in prosecution and litigation procedures and provides advice to DoE on aspects of international law and agreements. The AGC also provides legal services when new legislation require drafting, and to coordinate law reform. The AGO has already been notified concerning the drafting of ODS regulations in Seychelles.

3. Other Agencies

The Seychelles Licensing Authority

The Seychelles Licensing Authority is involved in authorising companies and private entrepreneurs to engage in commercial activities. This is done through a licence procedure. The Seychelles Licensing Authority Act (1986) makes provision for the enactment and enforcement of licences. Enforcement is done through an inspectorate team and decisions are made at the level of a Licensing Authority Committee.

The Seychelles Bureau of Standards

The Seychelles Bureau of Standards (SBS) is an independent corporate body responsible, in close collaboration with the DoE, for the establishment of environmental standards and codes of practices. Under the aegis of SBS, work to publish a 'Code of Practice for the phase-out of ODS' and 'Standards for Refrigeration Practice in Seychelles' is already started. All publications are then gazetted under the SBS Act to ensure compliance. Since its creation SBS has published over 10 Standards and 13 Codes of Practice.

The Seychelles Fire Brigade

The Seychelles Fire Brigade (SFB) is an authority set under the police regulations of the Seychelles, and therefore falls under the direct authority of the Commissioner of Police. The main roles of SFB is to :

- ☐ Provide expert advice on aspects of fire prevention.
- ☐ Provide a fire abatement service to homes, establishments, industries and ships.
- ☐ Act as an enforcing agency in applying fire protection regulations.

- ☐ Investigate into all cases of fire and damage to property by fire.

Even before the Seychelles ratification of the Montreal Protocol, the SFB has been actively involved in considering other alternatives to halons. They have carried out intensive surveys and have stopped giving recommendations for the use of halons. The SFB has also identified 'sensitive' areas and plans are being drawn up to ensure that fire safety standards are maintained.

The Seychelles Polytechnic (School of Engineering)

The Seychelles Polytechnic is a secondary school, under the Ministry of Education and Culture, involved in the formation of students for university and vocational employment. The School of Engineering runs the City and Guilds course in Refrigeration engineering, and all graduates are absorbed by the private sector. The school is presently considering starting to introduce courses in refrigerant recycling and handling. However, the School has requested that the Seychelles Country Program addresses this important issue, due to severe financial constraints.

2.4 POLICY FRAMEWORK

The Republic of Seychelles is now in its third constitution (since July 1993) and this Section is based on changes in Government policy since to improve the economic situation of the country. Policy measures undertaken by government involves

2.4.1. General

1. Privatisation of Public Enterprises

Due to changes in the economic structure the Government has decided to privatise certain public enterprises to provide a freer market. This will allow more private sector participation in the implementation of the Montreal Protocol.

2. Measures to attract foreign investment

Measures to attract foreign investment have been announced by the Ministry of Finance.

3. Revision of Trade Taxes and Regulations

At the beginning of the year 1994, taxes on imported products that have impacts on the environment were substantially increased to discourage consumption. This included increased taxes for the consumption of CFC deodorant aerosols, and decreased taxes on CFC-free products. Other incentives introduced encompass reduced taxes for Ozone friendly technology alternatives, but this is strict scrutiny, taking into consideration the technology transfer capability of the country.

4. Adoption of the Harmonized System of Trade Coding

For about four year the Government of Seychelles has been involved in the task of transmoving from the SITC system to the Harmonized System. The introduction of the system will allow greater opportunities for control and monitoring of imported goods, and also facilitate importers.

5. Review of existing regulations and procedures.

Due to the small size of the country, Government has always been sensitive to the inefficiency of certain command and control methods. Therefore, the Government has always been reviewing policies or regulations which do not accomplish the countries objectives. Under current review is the Environment Protection Act and the Town and Country Planning Act. The Trade Tax Act has just been reviewed, which incorporates new powers given on the control on imports, etc.. Under the revised version of the Environment Protection Act, specific mention of the Montreal Protocol signifies the Governments commitment to fully comply to the Montreal Protocol phase-out programs. It is envisaged that drafting of ODS phase-out regulations will be done soon. Enforcement of the Governments policies and control measures are done by bodies empowered to do so, e.g. the DoE, the Seychelles Licensing Authority and the Seychelles Bureau of Standards. All of these bodies are staffed with an inspectorate and enforcement team, with legal powers to enforce.

2.4.2. Government and Industry Responses to the Protocol

The concern for Seychelles to sign the Montreal Protocol was emphasised in the 'Environmental Management Plan for Seychelles 1990-2000 (EMPS) in 1990 when it was

first published. Seychelles has also signed the London and Copenhagen Amendments to the Montreal Protocol in 1993. Seychelles also became party to the Vienna Convention on the Protection of the Ozone Layer in May 1993. Seychelles as a developing country is classified as an 'Article 5 Country' under Article 5 (1) of the Montreal Protocol. In pursuance to Article 7 of the Protocol, Seychelles has already submitted its first set of data to the Ozone Secretariat in September 1993. Seychelles is also in full compliance with Articles 2, 2A-E and Article 4 of the Protocol since it does not produce any ODS and all demand is met through imports.

In April 1993, a National Working Group for the Montreal Protocol (NWGMP) was set up under the aegis of the Division of Environment. The Working Group consisted of representatives from the Ministry of Industry, Ministry of Foreign Affairs, Planning and Environment, Seychelles Fire Brigade, and the Private Sector.

Since its inception the Working Group has organised a National Workshop (October 1993) on the Montreal Protocol, published numerous articles, TV-Audio presentations on the ozone layer and the Montreal Protocol, survey for the reporting of Data, customs restrictions on ODS imports, preparation of policies and guidelines for certain projects. Most of the finance were drawn out of the DoE budget (about \$ 3,700), but the private sector also contributed financially (about \$ 1,000). A computerized database of all participating agencies has been set up by the Pollution Control Unit (DoE), for easy dissemination of information.

As from the beginning of 1994, all imports of ODS will require a Certificate of Clearance from the NWGMP. In this manner, the Government will be able to monitor the consumption of ODS. The importation of halons has been completely restricted as from January 1994.

In March 1994, a new committee was formed under the auspices of Seychelles Bureau of Standards (SBS) to develop a code of practice for the phase-out of ODS, and formulation of Standards for Refrigeration practice. This is estimated to cost the Government about \$ 2,000 for publishing.

In all the costs already incurred by the Government of Seychelles is about \$ 10,500.

Industry Response

Initially industry response has not been good, but as the issues become more and more pertinent, most refrigeration contractors are now expressing some interest in reclaiming refrigerants, alternatives and practicing better maintenance practices, e.g. the disuse of CFC-11 in leak-testing.

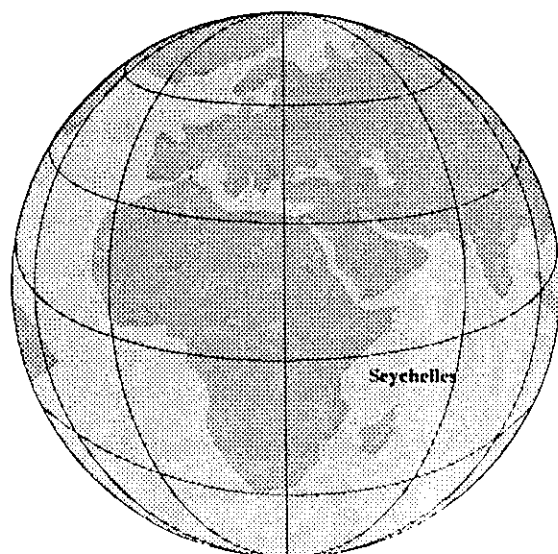
In September 1993, a private company brought in the first refrigerant reclaim and recycling portable system in Seychelles, and trials have shown that refrigerant recycling is a viable option for the Seychelles. This was done at a cost of \$ 15,000. Through an initiative addressed in this country program, the manager has been identified to undertake the City & Guilds assessors course in Refrigerant handling and retrofitting, so as to certify suitable engineers in Seychelles as well as in the Region. It is believed that there is no one in the region with this qualification at present.

Most establishments are now moving away from halon-based fire extinguishers, and Air Liquide is providing advice to consumers on this issue.

Members from the private sector have committed their time to participate in the NWGMP, which meets every two weeks.

The hotel sector is now using better planning techniques, especially when purchasing new refrigeration equipment, in renovations and extensions.

Retailers are also ensuring that their products are CFC-free, and even before restrictions were imposed, certain retailers were already importing CFC-free aerosols as a matter of course. Apparently, there is no significant changes in FOB prices of these goods, which shows that the Government incentives are working.



Implementing Phase Out

3.1 Strategy Statement by Government

The Government of Seychelles has provided a clear statement of the strategic objectives on which the Action Plan will be based.

- The Government has already initiated phase-out and will continue to do so in the light of availability of technical options and economic feasibility.
- The Government will work closely with the private sector to study aspects of technology transfer and economic viability, and propose an implementation plan to enact an earlier phase-out than that proposed by the Montreal Protocol.
- The Government has already started, and will continue, its efforts to foster public awareness at all levels of the society, through the use of the media, a resource centre set up under the DoE, the production of informative materials and the use of interactive workshops.
- The Government has reviewed its existing Environmental Protection Act and specific regulations implementing an early phase-out will be done, and will continue strict control on imports through the enforcement of the Trades Tax Regulations.

3.1.1. Phase Out Schedule

A phase-out schedule for each group of substances has been formulated in consultations between the Government, the private sector and the user sector. The different options considered are also described including the implementation schedule. Since different ODS are used in different sectors, the discussion involves the presentation of alternative options for all sectors.

ANNEX A Group I Substances

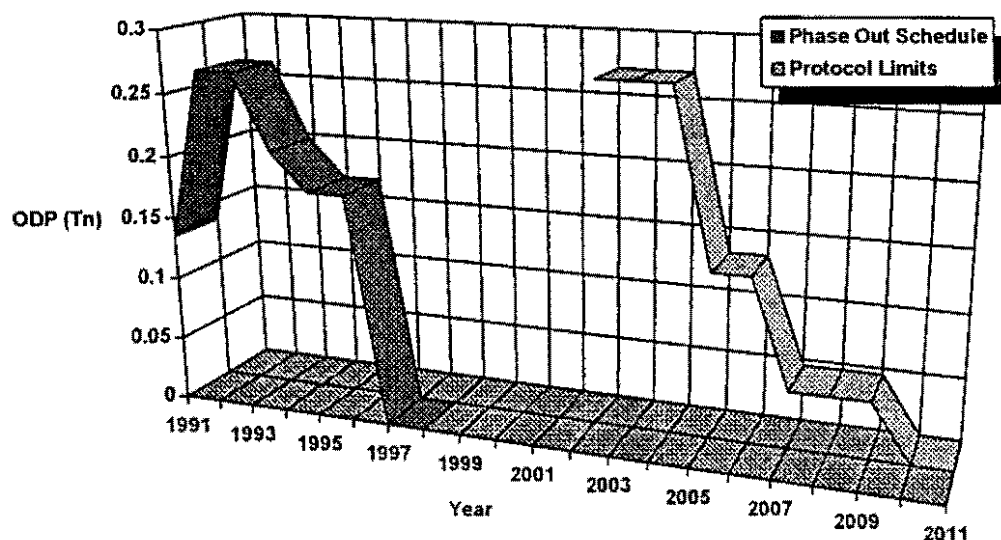
CFC-11, CFC-12 and CFC-115 (as R-502) are the only ANNEX A Group I substances imported by Seychelles. Since their use encompasses a multitude of sectors, effort has been placed on determining the phase-out timetable for CFC-12 in the refrigeration and cold storage sector and R-502 in the industrial cold storage sector. To match with the alternative options, these are grouped according to sector.

CFC-11

CFC-11, although used extensively in the past is now being progressively phased out. But this will depend upon the availability of other flushing substances to replace CFC-11. Consumption is also expected to be met through recycling of the refrigerant.

ODS	1991	1992	1993	1994	1995	1996	1997	1998
CFC-11	0.135	0.270	0.270	0.210	0.180	0.180	0	0

Planned Phase Out Schedule
CFC-11 in ANNEX A Group I



CFC-12

CFC-12 is still extensively used in the Seychelles, mainly as a recharge refrigerant in domestic and retail refrigerators and freezers, industrial cold stores and automotive airconditioners.

Domestic and Retail Refrigeration

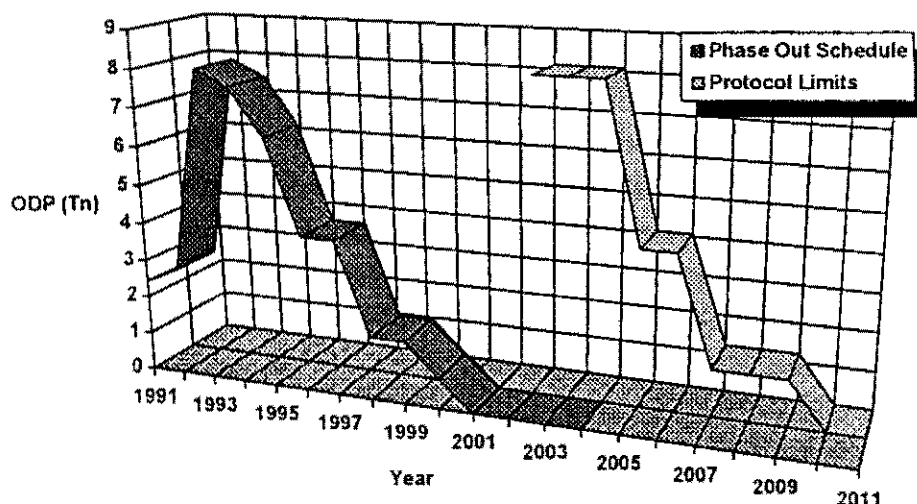
Seychelles being a tropical island archipelago, with seasonal variation of fish resources is fully dependent upon the necessities afforded by the refrigerator and deep freezer. In addition there are currently no affordable alternatives to the present type of refrigerator and deep freezer. As a result, a phase-out action plan has been very difficult to substantiate and the various actions that have been proposed will have to be continuously evaluated in the light of current developments and changes in phase out dates.

All automotive airconditioner systems also run on R-12 in Seychelles, and therefore face more or less the same problems as refrigeration. Automotive manufacturers are already equipping new cars with the 134a refrigerant, and therefore phase out in this sector has already started with a few cars being imported with the HFC-134a refrigerant. Since it is now illegal to import cars older than three years in the Seychelles, it is envisaged that all new cars will come equipped with the 134a system and therefore would not necessitate a special regulatory requirement under the action plan. However, due to the sensitivity of automotive air-conditioning units, it is expected that there would be a demand for qualified 134a qualified engineers soon.

Phase Out Schedule

ODS	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CFC-12	2.430	2.835	8.100	7.69	6.48	4.05	4.05	1.62	1.62	0.81

Planned Phaes Out Schedule
CFC 12 in ANNEX A Group I



Proposed Action

With a life-time of about ten years, all the refrigeration units will be allowed to run out their useful life, with subsequent recuperation of any CFC-12.

- ☐ Restrict all imports of CFC-11 starting from January 1994 and investigate all other available options on the market. Study the possibility of recycling CFC-11.
- ☐ Restrict all imports of CFC-12 starting from January 1994, reduce to 7.69 tonnes in 1994, reduce imports by 6.48 tonnes by January 1995, 4.05 tonnes by 1996, 1.62 tonnes by 1998, 0.81 tonnes by 2000, and consider banning all imports in January

2001. This can be achieved partially by improving standards of maintenance, refrigerant reclaim and the use of alternative refrigerants for all new installations.

- ❑ Set up a national CFC-12, R-22, R-502, R-134a reclaim centre and bank to spread out the cost of replacement. The government has already allocated the site for the proposed project, but financial assistance would be required under the multilateral fund. With a collection and reclaim efficiency of 20 % of CFC-12, it is expected that the bank would possess a potential pool of 0.02 tonnes (based upon a refrigerant charge of 200 g/unit and a scrap rate of 540 units/yr.), during its first year of service. The implementation date has been placed at June 1994. Reclaim done during repair is not accounted for above. However, reclaim of refrigerants has already been implemented on a low scale since June 1993.

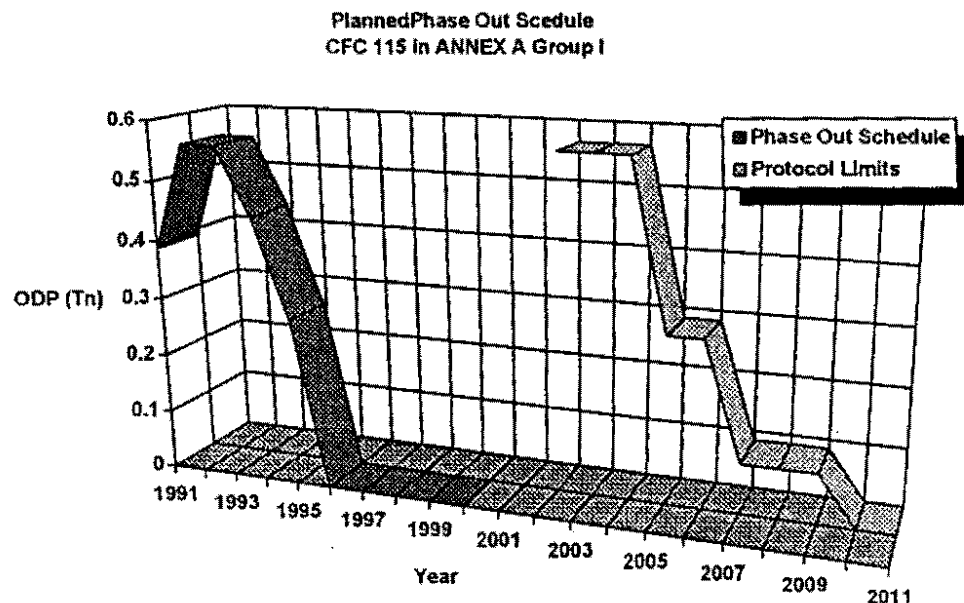
- ❑ Set up a regional centre of excellence for training technicians in refrigerant handling, retrofitting systems with alternative refrigerants. Discussions with the Mauritian government has established that a prominent refrigeration engineer in the region (based in Seychelles) has been trained in all those fields (CITB & City and Guilds), and on the point of becoming an assessor, so that technicians in the region, encompassing Mauritius, Comoros, Madagascar, Maldives, Kenya, Tanzania, Somalia and Seychelles, could be trained cost-effectively. Funds for the setting up of this centre will be sought from the Multilateral Fund of the Montreal Protocol. The project should be ready for implementation in August 1994.

CFC 115 (R-502)

Cold stores in Seychelles use R-12, R-502 or HCFC-22 and ammonia as refrigerant. Cold stores running on R-12 will either follow the phase out schedule for refrigerators but undergo retrofitting to 134a at an earlier stage, probably beginning of 1995. In view of the unavailability of alternatives to permanently replace the existing systems, it is envisaged that HCFC-22 would be used in the interim period to replace R-502. This interim period has been estimated to be about 10 years, and therefore would be economically feasible in the context of Seychelles. Although ammonia-based cold stores are also used in the Seychelles (only by the Seychelles Marketing Board), there may be plans to use more, but this will require careful study.

Phase Out Schedule

ODS	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
R-115	0.388	0.564	0.564	0.451	0.282	0	0	0	0	0



Proposed Action

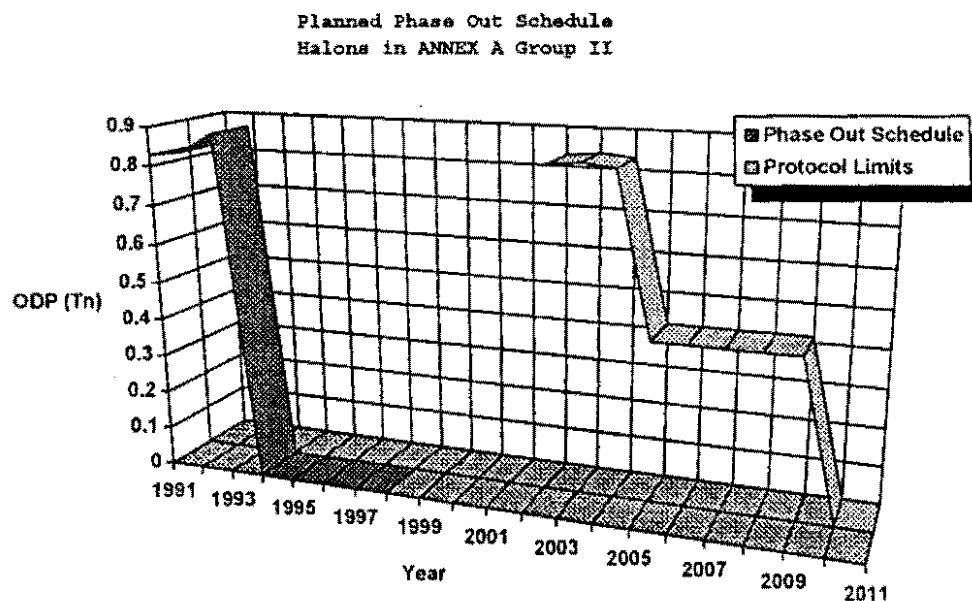
- ☐ Retrofit existing industrial systems to HCFC-22. Already certain cold stores have been retrofitted to work with HCFC-22, but more studies are required to determine viability. It has been estimated that all retrofits can be done within two years, i.e. by the end of 1995, with an 80% reduction in 1994, 50% reduction in 1995, and probably ban in 1996. This delay is important in the context of Seychelles considering the transitional nature of HCFC-22.
- ☐ Import new systems based on HCFC-22. The importation of these systems will also be closely monitored to establish recharge needs in the future, since those systems can have an estimated lifetime of 15 to 20 years. It is envisaged that any new technologies within the sector will be reviewed by the National Working Group for the Montreal Protocol every year to determine feasibility of implementation.
- ☐ Study the feasibility of purchasing ammonia-based cold stores or use other blends, e.g. KLEA 66 (ICI). Training would be required in refrigerant handling.

ANNEX A Group II (Halon 1211)

An assessment of essential uses has already been carried out. The Seychelles Fire Brigade determined that only telecommunication and big computer installations will require halon fire extinguishers, but recent investigations show that most can be effectively protected using powder or carbon dioxide technology if considered on a case by case basis. Therefore a ban on all importation of halons has been imposed as from January 1994.

Phase Out Schedule

ODS	1991	1992	1993	1994	1995	1996	1997	1998
Halon 1211	0.828	0.839	0.890	0	0	0	0	0

**Proposed Actions**

- ☐ A ban on all importation of halons and halon fire extinguishing systems has been imposed as from January 1994.
- ☐ The set up of a small halon bank is necessary until better facilities to protect the types of sensitive equipment identified are available at reasonable prices, and to minimise venting into the atmosphere.

- ☐ The Seychelles Fire Brigade will intensify its fire protection services, and offer a more specialised case by case approach.

Implementation Timetable

Options	Implementation Date	External Financial Assistance required
Ban imports	January 1994	No
Halon Bank	August 1994	Yes
Intensify Fire Protection	June 1993	No

3.2. Action Plan

3.2.1. Government Actions

The Government intends to take a firm commitment in meeting the goals and strategy set in Section 3.1 by:

Maintaining the National Working Group for the Montreal Protocol to oversee the favorable implementation of the strategy. This will ensure that the Government remains in touch with all developments.

Restricting the importation of CFC-12, CFC-115 as from the beginning of 1994, and banning Halon 1211 importation as from January 1994. All importers of ODS would have to account for sales before another permit would be issued. The effect would result in an earlier phase-out of ODS, and hence motivate the private sector to seriously consider the options proposed in the strategy.

Introducing reduced tax on goods containing ozone friendly chemicals and higher tax on ODS containing goods. For, example aerosol deodorants containing CFC attract a trades tax of 200%, whilst those without CFCs only attract 40% trades tax. As a result consumers buy deodorants which do not contain CFCs. Since the enforcement of this policy, about 80% of the retailers now import only non-CFC deodorants.

Providing the private sector with all assistance required in the implementation of the phase out strategy, e.g. priority for loans. Recently, the government has allocated a parcel of land at the industrial estate for the setting up of the National Reclaim Centre (Project P5).

Organising Seminars and Workshops for end-users. During the first national seminar on 'Impact of the Montreal Protocol', private sector participants voiced their commitment to voluntarily assist in the implementation of the strategy. The seminar organised in October 1993, gathered participants from the importers, engineers, hoteliers, government and numerous public enterprises.

Setting up a permanent national secretariat for the Montreal Protocol in the DoE, which will be equipped with resource facilities and open to all citizens and companies. A small library has been set up in the Documentation Centre of the DoE, and it is envisaged that interested members would be able to access the Ozone Action (Ozone Clearinghouse, UNEP IE/PAC) database, and search for up to date information.

Continuing its public sensitisation programs through the television, radio and newspapers and to publish guidelines for implementation of the Phase-out strategies in Seychelles. There has already been about twenty articles published and about five television and radio programs. A series of three informative leaflets will be published in Kreol ,the mother tongue, soon.

Aims to set Standards for refrigeration practice, and introduce an appropriate system of certification for refrigeration engineers. This project has already started. It is expected that there will be a Standard of refrigeration practice in Seychelles. This has numerous implications in assisting the implementation of the phase out by : (1) reduction of unnecessary venting by up to 80%, (2) better maintenance, therefore increased lifetime and efficiency, (3) allowing easier assessment of ODS wastage.

Foster regional cooperation through the setting up of a Regional Training Centre. Regional cooperation is an important government policy since it paves the way for more concerted action. Experiences can effectively be shared by countries in the region. Projects identified for implementation can be shared so that costs remain as economical as possible.

3.2.2 Projects

A series of projects has been identified through discussion with all concerned and through a seminar with the private sector. All these projects are well in accordance to the action plan proposed by the government. Detailed project proposal can be found in the last chapter of this study. The projects have been classed into three areas, each with an order of priority. The order of priority code starts from 1 = extremely urgent; 2 = urgent; 3 = not so urgent.

Project Summary

Training and Information Transfer

- P1 Institutional Strengthening. **Priority = 1**
Government Sector.
- P2 Setting-up a Regional Centre of excellence for Refrigeration Technicians and Engineers. **Priority = 1**
Private Sector.

Regulations, Guidelines and Standards

- P3 Drawing up of Statutory Regulations, Import Regulatory Requirements and Enforcement Procedures. **Priority = 2**
Government Sector.
- P4 Preparation of Standards and Codes of Practice. **Priority = 3**
Government and Private Sector

Ozone Depleting Substances Phase-Out Projects

- P5 Setting up of a National Refrigerant Reclaim & Recycling Centre. **Priority = 1**
Private Sector.
- P6 Setting up of a National Halon Bank. **Priority = 1**
Private Sector.

Detailed descriptions of the projects are outlined in the chapter entitled ' Projects Proposed within the Seychelles Ozone Action Program.

3.3 Roles in Implementing the Strategy

The Ministry of Foreign Affairs, Planning and Environment will remain as the leading and enforcing agency for the implementation of the country program. However, UNEP will remain as the major implementing agency.

Discussions have already been undertaken by representatives of the Division of Environment with representatives of :

- The Ministry of Industry
- The Ministry of Finance
- Customs and Excise Division
- Attorney General Chambers
- Seychelles Chamber of Commerce
- Seychelles Development Bank
- Leading private companies involved
- Importers of ODS
- Environment Steering Committee

All these Ministries, companies and organisations will be involved in the implementation of the Country program. The Ministry of Finance, through the Division of Foreign Affairs will handle all financial assistance received. The Seychelles Development Bank will then implement the terms of the project as is currently done with other financial assistance received for other projects.

3.4. Timetable and Consumption Implications

All phase-out schedules and Protocol Limits on consumption (in graphical form) are presented in Section 3.1.1 , and all forecast consumptions are presented in Section 2.1.2, as expressed in ODP tonnes.

Incremental Costs

In general the incremental costs envisaged by Seychelles are :

Government Costs : Substantial costs are involved in the implementation of the Montreal Protocol directives. Costings are based on 1994 figures. All options proposed for the planned phase-out were considered.

Cost (\$)/Year	1994	1995	1996	1997
Staff	6,000	6,000	6,000	6,000
Training	500	500		
Documentation	500			
Paper & Other Consum.	1,000	600	400	400
Communication Costs	1,000		1,000	
Operating Costs	1,000	1,000	1,000	1,000
Total (\$)	10,000	8,100	8,400	7,400

Based on actual figures as provided by the DoE.

Private Sector Costs : This encompasses three types of investments namely, training, new equipment, and technology transfer costs. Estimates are based on 1993 figures. All options for the planned phase-out was considered.

Cost (\$)/Year	1994	1995	1996	1997
Extra Staff	2,000	5,000	6,000	6,000
Training	4,000	4,000		
New Equipment	8,000	3,000	1,000	
Technology Transfer	1,000	1,000	1,000	1,000
Total (\$)	24,000	13,000	8,000	7,000

Based on a survey amongst the largest companies. Prices correct for 1993.

Consumer Costs : In the case of Seychelles, it is the consumer who will incur the greatest costs. These include : increased prices & taxes on ODS, and costs of technology transfer. Estimates were based on forecasted consumption, introduction of the R-134a refrigerant, retail prices in 1991, prices of new equipment, and costs on increased power consumption. All options for the planned phase-out were considered.

Cost (\$)/Year	1994	1997
ODS Consumption (including taxes)	50,100	78,000
New Equipment	188,000	213,000
Total (\$)	238,100	291,000

Based on information presented in the statistical bulletin.

In conclusion the total incremental costs to the country until the year 2002 will be \$615,000 (about SR. 3,259,500 million). This incremental cost is mainly due to the increasing costs of refrigerants, and cost of new technology.

3.5. Budget and Financing Program

The table presented in Section 3.4 shows the costs to be incurred by the Government for the various activities covered under the action plan for the period 1994 - 1997. Part of these costs, e.g. staff and consumables would be incorporated into the DoE current budget, but other aspects will require funding under the Multilateral Fund. Although the financial aspects of implementing the country program is extensively described in the last chapter, a summary of financial assistance required is presented below :

Project	Priority	Capital Costs	Recurrent Costs
P1	1	32,700	In kind- Government
P2	1	8,000	In kind- Private Sector
P5	1	263,000	Operation Costs- Private
P6	1	30,000	Operation Costs- Private
P3	2	0	In kind- Government
P4	3	0	In kind - Gov. & Private
Total		333,700	

The planned financial actions are such that at least \$ 300,000 is needed during the year 1994. Therefore the implementation of these projects, and hence the implementation of the phase out schedule is strongly dependent on the availability of these funds in 1994.

The table below summarises the grant assistance being sought from the Fund, as analysed by industry sector.

Sector	Purpose	Start Date	Funds Sought (\$)	Effective ODS reduct. 1994-1997 (tns)
Refrigeration and Air-conditioning	Reclaim Facilities for R-11, R-12, R-502, R-22 and R-134a	June 1994	263,000	3.809
Halon Users	Halon Bank	June 1994	30,000	0.273
Refrigeration Technicians	Regional Training	Aug. 1994	8,000	3.809

3.6. Monitoring Arrangements

Monitoring of the country program would be by the Ministry of Foreign Affairs, Planning and Environment (MFAPE). The Governments proposals to monitor the different action strategies are presented below :

Monitoring of annual consumption of ODS

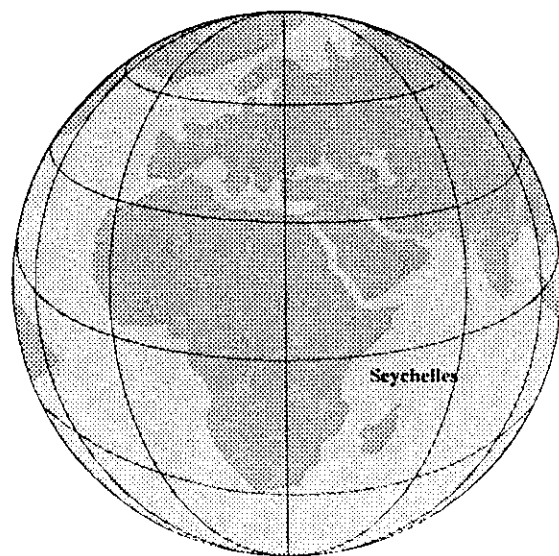
MFAPE in collaboration with the Ministry of Finance, has already set up a mechanism, effective January 1994, to monitor consumption. This involves the compulsory requirement of an import certificate, and providing MFAPE with details of sales.

Monitoring Government Actions

This is already being performed by the National Working Group of the Montreal Protocol, through advise and periodical review of planned government actions.

Monitoring of Projects

The monitoring of projects will fall under the auspices of the National Working Group as well as the Environment Steering Committee. Periodical audits would be carried out to ensure implementation and report to the fund.



Projects

Projects Proposed within the Seychelles Country Program

In the framework of the Seychelles Country program, the Division of Environment would be the focal point and coordinating agency for all projects considered in this chapter. However, implementing agencies will be appointed from recommendations of the National Working Group to implement the projects. Any projects involving the transfer of funds to the private sector would be done on an agreement basis between the Government and the private party involved.

The projects have been divided into three areas as addressed in the action plan : Training and Information Transfer; Policies , Regulations and Standards; and ODS Phase-Out Projects.

Projects Summary

Training and Information Transfer

- P1 Institutional Strengthening.
- P2 Setting up a Regional Centre of excellence for Refrigeration Students, Technicians and Engineers.

Regulations, Guidelines and Standards

- P3 Drawing up of Statutory Regulations, Import Regulatory Requirements and Enforcement Procedures.
- P4 Preparation of Standards and Codes of Practice.

Ozone Depleting Substances Phase-Out Projects

- P5 Setting up of a National Refrigerant Reclaim & Recycling Centre.
- P6 Setting up of a National Halon Bank

P1 Institutional Strengthening

Country	SEYCHELLES
Sector(s) Covered	ALL SECTORS
ODS Consumption in Affected Sectors (ODP Tones)	4.051
Project Duration	4 MONTHS
Project Impact	INFORMATION DISSEMINATION & LOCALISING IMPLEMENTATION
<u>Proposed Budget</u>	
Local Contribution	In kind
External Assistance	\$ 32,700
TOTAL	\$ 32,700
External Implementing Agency	UNEP IE/PAC
National Coordinating Agency	DOE
Local Implementing Agency	DOE

Project Summary

Since the formation of the **National Working Group for the Montreal Protocol (NWGMP)** in April 1993, the **Division of Environment, Pollution Control Unit**, has been involved in documentation and meeting the administrative needs of the NWGMP. Since the Unit has many other portfolio responsibilities and projects to oversee, this has added to the existing workload. As part of the Country's commitment to the phase out of ODS, the Pollution Control Unit will remain the Focal Point within the National Coordinating Agency. However, there is a need for the institutional strengthening, and development of an appropriate documentation and information retrieval facility, to assist in the implementation of the Action Programme.

The Pollution Control Unit, within its administrative framework, already has a Project Officer, and another is expected to be recruited within the next two years. In addition to other corporate responsibilities, the Project Officer would be responsible for the day-to-day coordination of the projects, and maintenance of the documentation facility.

Funding and assistance would be required to facilitate the administration of the Action Programme, and it is envisaged that the Government of Seychelles would meet the cost of the day to day management of the Action Programme, and provide existing computing facilities.

Project Description

Documentation and Information on issues relating to the phase out of ODS is necessary for the effective implementation of the Montreal Protocol.

Rationale

Being a rather isolated country, it is not always easy to obtain pertinent information quickly, or keep abreast of international developments in the various sectors.

It is also essential that appropriate information is readily available, not only to technicians but also to the public and other sectors.

Effective decisions and strategies can only be implemented through adequate availability of information.

External Technical assistance can be significantly reduced if the Documentation Facility is well established and equipped.

Moreover, there is an increasing need for Seychelles to establish national and regional networks for the exchange of information.

Short-Term Objectives

Facilitate the Activities of the NWGMP.

Equip the DOE, as the Coordinating Agency.

Make available information Support for the implementation of the Action Plan.

Up-to-date information necessary in the implementation of the individual projects.

Long-Term Objectives

Provide an up-to-date documentation facility to the concerned Sectors.

Increase Public Information and Awareness.

Establish sustained Information on the Protection of the Ozone Layer.

The framework of the project encompasses the provision of :

- In-country Training : Project Management & Computer Information Systems.
- Acquisition of Books, Audio Visual Aids, Technical Training Manuals, Publications.
- Subscriptions to technical, informative journals for up-to-date information.
- Photocopier for dissemination of information and production of educational materials.
- Fax Machine for acquisition and dissemination of information.
- CD ROM & Software, and other Computer Consumables for efficient storage, manipulation and retrieval of information.
- Operating Costs for the day-to-day implementation of the activities.

The costs for all the items above are necessary for a speedy compliance to the Protocol and the Action Programme, and would therefore constitute an incremental cost.

Proposed Budget

The figures are based on 1994 cost estimates.

Cost (\$)/Year	1994	1995	1996	1997
Training	5,000	5,000		
Documentation	6,000	-	2,000	-
Subscription	500	500	600	600
Photocopier	5,000	-	-	-
Fax Machine	1,000	-	-	-
Computer Acc.	2,000	-	1,000	-
Operating Costs	2,000	2,000	2,000	2,000
Total (\$)	21,500	3,000	5,600	2,600

Total Funds Required under the Multilateral Fund : \$ 32,700

Non-monetary inputs would involve assistance from the Government, as in office space, seminar rooms, etc. and the private sector, in terms of provisions of specific technical materials and advisory notes.

Project Timeframe

In principle, certain aspects of the project will extend beyond the implementation of the present Action Programme, as the Country is firmly committed to support the Montreal Protocol Agreement for the protection of the ozone layer. It is expected that the country would benefit from better management practices which will require maintaining long after the goals of the Action Plan has been achieved.

Within the Action Programme, concerted effort to implement the project would be spread over four years, i.e. from 1993 to 1996, at which all of the projects will receive the required information support. Documentation materials are already being collected and documented, and provision of the necessary funds and assistance at the earliest, would accelerate the project.

Implementation Arrangements

The External implementing agency for the project will be UNEP, with technical assistance from the IE/PAC Sector and IPIC database sector. The Division of Environment Documentation Centre and the Pollution Control Unit will offer the services of its staff and facilities for successful implementation of the project.

Institutional Framework

Coordination of the project from the Division of Environment would be executed by the NWGMP. The Documentation Facility will fall under the Pollution Control Unit, as the local implementing agency. The documentation facility would be available for consultation by any member of Government, Private sector, Students, NGOs and anyone who may require technical assistance. After implementation the database would be available on a local area network for easier access.

P2 Setting up a Regional Centre of excellence for Refrigeration Students, Technicians and Engineers.

Country	SEYCHELLES
Sector(s) Covered	REFRIGERATION SECTOR
ODS Consumption in Affected Sectors (ODP tones)	3.223

Project Duration	1 Year
Project Impact	IMPROVED, EFFECTIVE MEASURES TO REDUCE EMISSIONS
Proposed Budget	
Local Contribution	In kind
External Assistance	\$ 8,000
TOTAL	\$ 8,000
External Implementing Agency	UNEP
National Coordinating Agency	DOE
Local Implementing Agency	Private sector, MOE

Project Summary

Strategies for the complete phase-out of CFCs does not only involve restrictions on use, but also on better commissioning, maintenance, repair practices, and emission reduction measures. The project has been presented to bring all service engineers together and to provide specialised training of refrigerant handling, especially those offered by the City & Guilds (London) , the C & G 2077 Certificate in the "Safe Handling of Refrigerants" and by the Construction Industry Training Board (CITB). The Seychelles already has an experienced engineer with these qualifications who is ready to offer these courses locally. However, our survey has shown that there are no qualified assessors, even within the region. Therefore a first step would be to arrange for a City & Guilds assessor to be qualified through a grant from the Multilateral Fund.

Project Description

From the study it has been observed that there is indiscriminate use of CFCs in repair and maintenance of refrigeration equipment. This wastage is due to improper training and certification and lack of appropriate standards. An assessment of potential participants for this certification program was done. An estimated total of 120 refrigeration technicians in Seychelles would require the training. A total of 12 students is expected every year. From the Western Indian Ocean region it is expected that at least 200 potential participants would benefit from such a certification program. Upon the implementation of the particular project, the action plan has proposed the setting up of a regional training centre for refrigeration engineers, not only in refrigerant handling but also in retrofitting and other aspects, as discussed under project P5.

Rationale

There is a need for certification to understand and implement regulations and standards effectively.

There is a lack of properly qualified personnel in the refrigeration sector.

To implement the Montreal Protocol guidelines and that of the country program, there is a need for specialised training.

Cost of training abroad can be very expensive on an individual basis.

The regional perspective of training is necessary to ensure compliance, especially in the developing world context.

Short-Term Objectives

Draw up a certification program.

Establish standards for refrigeration practice.

Facilitate enforcement of the government actions.

Provide a training opportunity to companies who cannot afford otherwise expensive courses.

Long-Term Objectives

Ensure the implementation of the phase out schedule.

Provide a foundation for the subsequent technology transfer involved in the phase out of ODS.

The framework of the project encompasses the provision for:

- training abroad (probably the United Kingdom) for one month, for one person for the City & Guilds Assessors course. The grant would include course, living and certification expenses.
- training materials in the form of teaching aids.
- training rooms and facilities would be incorporated into project P5.

Proposed Budget

Cost (\$) /Year	1994
Training of one engineer abroad to be ASSESSOR (1 month , UK)	7,000
Training Equipment	1,000
Infrastructure	see P5

Total Funds Required under the Multilateral Fund : \$ 8,000

Project Timeframe

This project should be implemented immediately as there is currently a great need for these qualified personnel. After the successful qualification of an assessor, the courses could then be run locally, as well as regionally with minimal costs, throughout the entire action plan.

Implementation Arrangements

The External implementing agency for the project will be UNEP. The Division of Environment will act as the local coordinating agency. A potential candidate from the private sector, for this course has already been identified. Upon the completion of project P5, all courses would be run on location, and using the relevant equipment available for the particular project.

Institutional Framework

Coordination of the project from the Division of Environment would be executed by the NWGMP. The Certification Faculty will be from a panel of examiners in collaboration with the Ministry of Education and the private sector as the implementing agencies. The certification program would be available to all persons involved directly or indirectly with refrigeration maintenance, etc., and all students graduating from the Seychelles Polytechnic, School of Engineering. It is envisage that the courses would be extended to other countries in the region.

**P3 Drawing up of Statutory Regulations, Import
Regulatory Requirements and Enforcement Procedures.**

Country	SEYCHELLES
Sector(s) Covered	ALL SECTORS
ODS Consumption in Affected Sectors (ODP tones)	4.051
Project Duration	1 YEAR
Project Impact	COMPLIANCE PROCEDURES TO ACHIEVE PHASE-OUT SCHEDULE
<u>Proposed Budget</u>	
Local Contribution	In kind
External Assistance	\$ 0
TOTAL	\$ 0
National Coordinating Agency	DOE (NWGMP)
Local Implementing Agency	DOE / AGO

Project Summary

In the new revised Environment Protection Act, there is the specific provision for the development of regulations to implement the action plan. The regulations would regulate the import and disposal of ODS substances, the phase-out measures as stipulated in the Standards, and provide a mechanism for ensuring that ODS are not deliberately released into the atmosphere.

Rationale

No local regulations to implement action plan.

Ensure phase out schedule is maintained.

Short-Term Objectives

Proper control and accountability on imports and disposal of ODS.

Ensure established standards are maintained.

Reduce consumption of ODS through better control

Project Timeframe

Finalisation of the new environment protection act is imminent, it is expected that the regulations could be drafted towards the end of 1994, and become regulations by the beginning of 1995. The regulations would also be dependent on the amount of assistance received from other countries in terms of relevant available regulations which can be incorporated and modified. However, under the new Trades Tax Act, the DOE is already regulating the importation of ODS substances through the issue of import certificates.

Implementation arrangements

Since the project would be implemented without necessitating any external funds, the Division of Environment would be the leading implementing agency in collaboration with the Attorney General's Office (AGO). The regulations would be gazetted under the new Environment Protection Act by the government.

Institutional Framework

The enforcement of the regulations would fall under the responsibility of the Division of Environment in collaboration with the Seychelles Bureau of Standards. The DOE would be assisted with a refrigeration expert on site inspections and investigations.

P4 Preparation of Standards and Code of Practice.

Country	SEYCHELLES
Sector(s) Covered	REFRIGERATION SECTOR
ODS Consumption in Affected Sectors	3.223 ODP Tonnes
Project Duration	1 YEAR
Project Impact	IMPROVED, EFFECTIVE MEASURES TO REDUCE EMISSIONS
Proposed Budget	
Local Contribution	In kind
External Assistance	\$ 0
TOTAL	\$ 0
External Implementing Agency	UNEP
National Coordinating Agency	DOE
Local Implementing Agency	SBS

Project Summary

The formulation of specific standards for refrigeration practice has already been initiated in February 1994. The recommendation was received from a national seminar that was organised in October 1993. These documents would be made available to every one as a tool to ensure better commissioning and maintenance standards. Aspects of planning for the future would be strongly emphasised in the documents.

Project Description

Current practices of refrigeration maintenance in Seychelles leads to the release of refrigerants into the atmosphere. It is therefore imperative that all repair and maintenance sectors are prepared and informed, to ensure uniform enforcement. The project involves the formulation of a general document on implementing the phase out schedule, and a second technical document which will set standards for refrigeration practice.

Rationale

A precursor to compliance to enforced regulations.

Need for consolidatory and standard practices.

Short-Term Objectives

Provide a simple layman format for implementation of the action plan.

Ensure compliance to the Montreal Protocol Resolutions.

Institute better maintenance practices

Ensure the success and practicality of the refrigerant pool.

Proposed Budget

No major financial costs has been imposed for this project as it involves cross-sectoral participation under the auspices of the Seychelles Bureau of Standards, which is the empowered body to set up standards. However, to allow for extensive readership, the budget proposed in Project P1 incorporates printing costs for the same.

Non-monetary contributions would be time devoted by the experts in the preparation of the Standard.

Project Timeframe

Due to public demand the formulation of these documents has already started and a first publication is expected soon. This project would require at least one year to complete as it involves private sector experts as well as SBS personnel.

Implementation arrangements

A technical committee has already been set up under the auspices of the Seychelles Bureau of Standards (SBS) and meets fortnightly. UNEP IE/PAC has already played an important role by providing the working group with information on other similar documents done by other countries. Upon completion of the documents SBS will proceed with publication and accreditation as a code of practice or as a Standard.

P5 Setting up of a National Refrigerant Reclaim & Recycling Facility

Country	SEYCHELLES
Sector(s) Covered	REFRIGERATION SECTOR
ODS Consumption in Affected Sectors	3.223 ODP Tonnes
Project Duration	2 YEARS
Project Impact	PROVIDE A REUSABLE POOL OF CFCs AND REDUCE ECONOMIC IMPACT OF PHASE-OUT SCHEDULE
Proposed Budget	
Local Contribution	Operating Costs
External Assistance	\$ 263,000
TOTAL	\$ 263,000
External Implementing Agency	UNDP
National Coordinating Agency	DOE & MOI
Local Implementing Agency	Cooling Plus Limited

Project Description

In Seychelles the use of CFC refrigerants is widespread in most economic sectors such as tourism, fishing, medical services, industry and domestic establishments. Since it is expected that domestic refrigerators would be phase-out rather quickly (i.e. as they break-down), it is expected that the bank will be able to provide refrigerants only to the commercial sector. The government has already allocated the site for the proposed project, but financial assistance would be required under the multilateral fund. With a collection and reclaim efficiency of 20 % of CFC-12, it is expected that the bank would possess a potential pool of 0.02 tonnes (based upon a refrigerant charge of 200 g/unit and a scrap rate of 540 units/yr (data obtained from the official scrap metal dump site)) of CFC 12, during its first year of service which would otherwise have been destined for disposal through venting. Reclaim during repair is not accounted for above, since it could induce double-counting but it is envisaged that the pool could double overnight as greater reclaim efficiencies can be achieved during maintenance, hence reducing the need for

recharge from the bank. Reclaim of refrigerants has already been implemented on a low scale since June 1993. The reclaim centre would also be equipped with small, portable reclaim units for loan to refrigeration companies. The reclaim centre would be equipped to recover all the types of refrigerants used in Seychelles. The project would also involve setting up a R 22 bank to ensure a speedy phase-out date on importation of R 22.

Rationale

Complete replacement of all refrigeration equipment which is presently not economically or technically feasible.

Retrofitting systems require more detailed study at this stage, especially as regards to individual systems in place.

A transitionary period is required for capacity placement and building.

Phase-out of CFCs.

Short-Term Objectives

Ensure the availability of a reusable pool of refrigerants for existing equipment.

Ensure compliance to the Montreal Protocol.

Reduce importation of all ODS, including R 22.

Long-Term Objectives

Complete phase out of ODS substances

Reduce the economic burden of technology transfer and the rising costs of refrigerants.

Encourage and promote programs for conservative consumption of ODS.

Proposed Budget

The proposed budget involves the procurement of recovery and reclaim equipment, and infrastructure. The capital expenditure is for consideration for financial assistance under the Multilateral Fund.

The study has shown that only one small recycling unit is necessary. To ensure proper recovery and management of the pool a few portable units and a transport will be needed for use by contractors on the field. The building will house the recycling unit, the refrigerant bank, and equipment with other facilities such as training.

Cost (\$)/Year	1994
1 Central Refrigerant Reclaim/Cleaning Unit	19,000
3 Mobile Reclaim Units	40,000
Reclaim/Cleaning Accessories	4,000
Transport - 1 ton pick-up	40,000
Building - 300 sq.m infrastructure	150,000
Consultancy & Commissioning Costs	10,000
Total (\$)	263,000

Pricing and cost control of the reclaimed CFCs will be managed by the Ministry of Finance, in accordance to government procedures and regulations, as a controlled commodity.

Project Timeframe

In view of the urgency of the situation, because of the Montreal Protocol phase out dates, the project has been under consideration by the government since December 1993. A special site has already been by government to implement the project. It is expected that financial assistance will be required as soon as possible, e.i. by August 1994, to ensure that the phase out schedule proposed is met.

Institutional Framework and Implementation Arrangements

The leading implementing agency for this project would be UNDP with the DOE acting as the local coordinating agency. Modalities for disbursement of funds to the local implementing agency would be according to current procedures. The Ministry of Finance will handle all financial aspects. The implementing agency, which has currently been identified as Cooling Plus Ltd., has been in regular communication with the DOE, and it has been agreed that the company would be responsible for all recurrent costs.

P6 Setting up of a National Halon Bank

Country	SEYCHELLES
Sector(s) Covered	HALON SECTOR
ODS Consumption in Affected Sectors	0.828 ODP Tonnes
Project Duration	1 YEAR
Project Impact	PROVIDE A REUSABLE POOL, REDUCE EMISSIONS,
Proposed Budget	
Local Contribution	Operating Costs
External Assistance	\$ 30,000
TOTAL	\$ 30,000
External Implementing Agency	UNDP
National Coordinating Agency	DOE
Local Implementing Agency	AIR LIQUID LTD

Project Description

The management of the existing halon stocks available in Seychelles is one way to ensure that all essential uses of the substances are met to minimize risks of fire susceptibility, and that existing fire extinguishers do not lose existing contents. A halon bank system requires the cooperation of all responsible agencies. Since the beginning of 1994 it has been government policy not to approve any recommendation for the use of halon fire extinguishers, so the recycled halons would only be used to support essential uses. The halon bank is envisaged to store about 1200 kg (derived from portable units in non-essential areas) and about 200 kg (surplus from previous imports), making a total of 1400 kg of Halon 1211 in the bank. Halon 1211 will be used as recharge for essential areas. There is also the need to setup a small Halon 1301 bank, about 250 kg (recovered from abandoned systems) to sustain the Cable & Wireless Central Communications Facility.

Rationale

There has been a total phase-out of halons in 1994

There is a special need to protect certain communication, medical and computer equipment.

There are limited means of disposal of existing stock

The cost of total replacement is not economically feasible.

Short-Term Objectives

To extend the life of existing halon systems

To maintain a reusable pool of halons

Long-Term Objectives

To promote better fire prevention engineering practices.

To spread out the economic burden of replacement.

To eliminate the requirement for the importation of recycled halons

Proposed Budget

To implement the project a small reclaim unit is required. The capital expenditure is for consideration for financial assistance under the Multilateral Fund.

The study has shown that only one small reclaim unit is necessary. Since there is only one company dealing with halons in the Seychelles there is no necessity for portable units. The building will house the reclaim unit and the halon bank. The company has pledged to meet all the operating costs of the operation as it would like to integrate the bank into its existing activities.

Cost(\$)/Year	1994
1 Central Halon Reclaim Unit	10,000
Infrastructure	11,000
Storage Cylinders	9,000

Project Timeframe

The project is expected to be initiated in August 1994. Since there is already a ban on imports halons by Seychelles, it is important that the project is executed as soon as possible to avoid the need for importation should there be an essential need requirement.

Institutional Framework and Implementation arrangements

The leading implementing agency for this project would be UNDP with the DOE acting as the local coordinating agency. Modalities for disbursement of funds to the local

implementing agency would be according to current procedures. The Ministry of Finance will handle all financial aspects. The implementing agency, which has currently been identified as Liquide Air Ltd., has been in regular contact with the DOE, and it has been agreed that the company would be responsible for all recurrent costs.

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