



**United Nations
Environment
Programme**

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/46/36
3 June 2005

ORIGINAL: ENGLISH



EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Forty-sixth Meeting
Montreal, 4-8 July 2005

PROJECT PROPOSAL: VENEZUELA

This document consists of the comments and recommendations of the Fund Secretariat on the following project proposal:

Production

- Phased reduction and closure of the entire CFC production: 2005 annual programme

World Bank

**CLOSURE OF THE CFC PRODUCTION SECTOR IN VENEZUELA: VERIFICATION
OF THE 2004 CFC PRODUCTION IN PRODUVEN AND 2005 ANNUAL
IMPLEMENTATION PROGRAMME**

Introduction

1. The Executive Committee at its 44th Meeting in 2004 approved in principle a total of US \$16.5 million for the implementation of the Agreement for the Venezuela CFC production sector, and disbursed the first tranche of US \$3.3 million to the project. Under the Agreement, the Government of Venezuela is committed to closing down the entire CFC production capacity at Produven, the country's sole CFC producing plant by the end of 2006. The main elements of the Agreement are presented in the following table.

Year	2004	2005	2006	2007	2008	TOTAL
Max. annual allowable production (MT)	4,400	2,913	2,913	0	0	10,226
TOTAL MLF grant (US\$ million)	3.30	8.1	1.75	2.3	1.05	16.50
PRODUVEN (*)	3.2	8	1.65	2.2	1	16.05
TA (FONDOIN)	0.1	0.1	0.1	0.1	0.05	0.45
Agency fees	0.2475	0.6075	0.1312	0.1725	0.0787	1.2375

(*) Labor compensation will be paid according to the requirements of the Venezuelan laws, and will be absorbed by PRODUVEN.

2. The World Bank is submitting to this meeting the request for the release of the 2005 tranche of US \$8.1 million and the associated support cost of US \$607,500. In accordance with the terms of the Agreement which required an independent verification of the achievement of the target in 2004, the World Bank has submitted a report on the verification of the CFC production of Produven in 2004 as well as the 2005 annual work programme (both are attached).

Verification of the 2004 CFC production in at Produven

3. The verification was carried out in March 2005 by Jorge Corona, a technical consultant and Dr. Juan de Dios Naveda, a certified accountant from Venezuela. Mr. Vogelsberg Jr. who has been conducting CFC production verifications for the World Bank in China and was involved in the audit of Produven in 2002, supervised to the preparation of this verification report. The report includes a summary; a report of the technical consultant on the inspection of the plant and his conclusions; the report of the financial consultant on the results of the financial audit; and finally, the presentation of the data using the format provided for in the guidelines on conducting verifications in the ODS production sector approved by the Executive Committee.

4. The summary described the approach adopted by the audit and overall conclusions. The inspection of the plant included the description of the production process and the point of production where reliable data could be collected for the purpose of production verification. The plant was designed with the capability of a "swing" operation between CFC-11 and CFC-12 and HCFC-22. Although it had a capacity of 12,000 Mt/year in 2002, the Government approved a production capacity of 9,000 Mt, which was split into 2,500 Mt for HCFC-22 and 6,500 Mt for CFCs. In 2004 the plant tried to recycle CFC-11 to increase the production of CFC-12 in response to demand. In the control room the verification team observed the possibility of

obtaining readings on the flow of input and reaction, however it was considered impossible to obtain accurate daily input and output by extrapolating these readings since they were only intended as process control mechanism. The daily log book was determined to be more reliable once being checked against accounting data.

5. The verification focused on the purchase and consumption of CTC as the main checking point for validating the CFC production level, because Produven was the only authorized importer of CTC for the production of CFCs and was not allowed to sell it on the market. This was controlled by the Ministry of Environment and Natural Resources under import quota. By concentrating on the CTC imports and the consumption ratio of CTC for CFC-11 and CFC-12 production, it was possible to calculate the maximum volume of CFCs that could be produced and confirm the level of CFC production reported by the plant.

6. The financial audit reconstructed and presented in the tables the monthly figures on sales, the production of CFCs and HCFC-22, the consumption of CTC and HF, and the purchase of CTC. Data on HCFC-22 was included to account for the total consumption of HF, which was a common raw material for CFC-11/12 and HCFC-22. Both the data for 2003 and 2004 were presented, with those from 2003 being audited to serve as the basis for the 2004 audit.

7. The results of the verification showed that Produven produced 3,566 MT of CFCs in 2004 which was broken down into 289 MT of CFC-11 and 3,267 MT of CFC-12. This was significantly below the annual maximum allowable production level of 4,400 MT as provided for in the Agreement for 2004.

8. The data collected by the verification team were presented using the format set out in the guidelines for verifying ODS production phase out, which includes month-by-month production of CFCs and HCFC-22, number of days in production, consumption ratios of feedstock to CFC and HCFC-22 production, inventory change of feedstock of CTC and HF as a way of validating the CFC production.

The 2005 work programme

9. The 2005 work programme included two parts, an introduction on the 2004 annual programme and the proposed 2005 annual work programme. As part of the report on the 2004 annual programme, the submission reported the signing of the grant agreement between the World Bank and the Government and between the Bank and Produven. The Government issued Presidential Decree 3228 which banned the import/export of all ODS.

10. In 2005 the plan foresaw a number of policy activities and technical assistance initiatives. The most important objective of the plan was to ensure the achievement of the CFC production reduction target for the year. Fondoin was authorized to continue the enforcement of the CFC production cap for Produven and would allocate one professional staff on a full-time basis to visit the plant and review the records no less than once every 4 weeks. There would be public awareness campaigns to assist in this and other ozone related activities. There would also be efforts to develop guidelines for the eventual dismantling of the CFC production facility at the plant. Annex I provides in tabular form the proposed activities in 2005 and a cost estimate and date of completion.

11. Of the total US \$8.1 million being requested for 2005, US \$8 million would be disbursed to Produven to maintain the production quota and the balance of US \$0.1 million will be allocated to technical assistance activities.

Comments of the Secretariat

12. The 2005 work programme proposed the target for the maximum allowable CFC production, which was consistent with the Agreement. The Government of Venezuela had introduced in 2004 the decree to ban the import/export of all ODS, including CTC, a key feedstock for CFC production, and exercised control on the amount of CTC that Produven could import for CFC production. There would also be a number of other facilitating measures adopted by the Government for the implementation of the production phase out, including monthly visits by Fondoin to the plant to check the production logs.

13. This was the first verification exercise implemented under the Venezuela CFC production agreement. Although it was conducted by the same consultant who had implemented the audit in Argentina, the World Bank reinforced the verification team this time by including another consultant who had relevant expertise and extensive experience in carrying out verifications. We would encourage the World Bank to continue its effort to standardize the verification exercise across the countries where they are implementing production sector projects.

14. There was an effort to comply with the guidelines for verifying ODS production phase out. The methodology of using CTC import and consumption data as the main check point for CFC production was a valid one. However it would have provided a greater level of assurance if the verification had included more information on the enforcement of the ban on CTC and other ODS imports recently introduced by the Government in 2004.

15. In accordance with the practice of presenting the verification reports on CFC production, the Secretariat included only the aggregate data, and not the detailed monthly breakdown of the CFC production and consumption of CTC and HF. However the data could be made available to any member of the Executive Committee upon request.

Recommendations

16. The Secretariat recommends that the Executive Committee:

- (a) Takes note of the verification report of the CFC production at Produven in Venezuela for the year 2004; and
- (b) Approves the 2005 work programme of the Venezuela CFC production phase-out Agreement at US \$8.1 million with US \$607,500 support costs for the World Bank, in view of the fact that Venezuela had achieved the CFC production reduction target in 2004 as confirmed by the verification.

**STRATEGY FOR GRADUAL PHASE-OUT OF
CFC-11 & CFC-12 PRODUCTION IN
VENEZUELA**

2005 ANNUAL PROGRAM

FONDOIN / PRODUVEN

AND

THE WORLD BANK

APRIL 2005

1. DATA

Country	Venezuela		
Year of plan	2005		
No. of years completed	0		
No. of years remaining under the plan	4		
Total ODS to be phased-out through the Strategy for Gradual Phased out of CFC - 11 & CFC -12 Production in Venezuela	CFC – 11 + CFC – 12 : 10,226 MT		
ODS Production for the Previous year (2004) (MT)		Target	Actual
	CFC 11/12	4,400	3,564.73
CFC production independently verified	Yes		
Target ODS Production for the year of the plan (MT)	CFC 11/12 : 2,913 MT		
Total MLF funding approved for the Plan	US\$ 16.50 Million		
Total funds released so far	US\$3.3 Million*		
		Funding	Disbursed (*)
Total funding disbursed on annual plans	Year 2004	3,300,000	3,300,000
	Year 2005	8,100,000	0
	Year 2006	1,750,000	0
	Year 2007	2,300,000	0
	Year 2008	1,050,000	0
	Total released	16,500,000	3,300,000
Level of funding requested for this AP	US\$8,100,000		
Support costs	US\$ 607,500		
Lead implementing agency	The World Bank		
Local Co-operating agency (ies)	FONDOIN		
	PRODUVEN		

(*) Disbursements will start after the signing of the Grant Agreements

A: INTRODUCTION

Provide a brief general overview on the status of the implementation of the NOPP/SOPP and recent progress, new initiative, achievements etc.

- 1 In compliance with the Montreal Protocol, the Government of Venezuela (GOV) should fulfill the obligations on phasing-out CFC-11&12 production by 2010. The CFC Production Phase-out Plan for Venezuela was approved at the 44th meeting of the Executive Committee (ExCom) of the Multilateral Fund for the implementation of the Montreal Protocol and involves a sole production facility at Productos Halogenados de Venezuela C.A. (PRODUVEN). The table below summarizes the phase out schedule as per the Agreement between the ExCom and the GOV:

Table1: Phase-out schedule as per the Agreement with ExCom:

Year	2004	2005	2006	2007	2008	TOTAL
Max. annual allowable production (MT)	4,400	2,913	2,913	0	0	10,226
TOTAL MLF grant (US\$ million)	3.30	8.1	1.75	2.3	1.05	16.50
PRODUVEN (*)	3.2	8	1.65	2.2	1	16.05
TA (FONDOIN)	0.1	0.1	0.1	0.1	0.05	0.45
Agency fees	0.2475	0.6075	0.1312	0.1725	0.0787	1.2375

* Labor compensation will be paid according to the requirements of the Venezuelan laws, and will be absorbed by PRODUVEN

- 2 Along with the Annual Plan, the World Bank has submitted the findings of the independent external audit for the 2004 CFC production at PRODUVEN. This report includes information to support the accomplishment of the proposed maximum production targets in this period.
- 3 Measures required by the GOV and PRODUVEN during the review of the Annual Plan 2005 were comprehensively addressed by the company.
- 4 The Grant Agreement between the GOV and the Bank, as well as the Grant Agreement between the Bank and PRODUVEN were signed on May 5, 2005.
- 5 Venezuela will reduce its maximum CFC production level as agreed for 2005 to 2,913 MT, and will maintain this production level through 2006.

B: 2005 ANNUAL PROGRAM

1. ACTIVITIES EXPECTED TO BE IMPLEMENTED DURING THE 2005 ANNUAL PROGRAM

The phase-out plan under implementation includes the following activities:

- (a) Phasing out CFC production by 2007;
- (b) Dismantling PRODUVEN's CFC production capacity;
- (c) Monitoring achievement of each year's production under the maximum cap agreed with ExCom
- (d) Implementation of policy measures and technical assistance activities to support the plan in a sustainable permanent manner

For 2005, the following activities are expected to take place:

1.1 Policies, regulations etc. and governmental actions and initiatives

- (e) Import / Export licensing System: The presidential Decree 3228 (Nov 2004) bans the imports of all controlled substances. The system is enforced by the Ministry of Environment and Natural Resources, and the Customs Office. Technical assistance is required to strengthen the Customs Officers to avoid illegal traffic.
- (f) Annual Production caps: Venezuela has been in compliance with the Montreal Protocol phase-out schedule for 2004, which has been enforced by FONDOIN and the Ministry of Environment and Natural Resources; this monitoring and enforcement will continue during 2005.

1.2 Technical assistance activities for 2005

The technical assistance component (\$450,000) will be implemented throughout the project implementation (through 2008). The following activities will be implemented during 2005:

- *Supporting the GOV to strengthen technical capacity of local staff*: This will include training of GOV staff, plus workshops for various participants in the phase-out program, including training in reclamation and re-cycling;

- *Public Awareness campaign:* This activity will support the ozone protection communication strategy prepared by FONDOIN, and is linked to other activities currently being implemented by FONDOIN;
- *Develop environmental guidelines for dismantling of the PRODUVEN CFC production capacity:* A set of environmental guidelines to address environmental friendly activities regarding the plant's CFC production capacity dismantling will be developed by FONDOIN.
- *Technical assistant to PRODUVEN:* This component aims at supporting PRODUVEN to explore production of substitutes to CFCs in.

The terms of reference and work schedule will be agreed with World Bank prior to initiating work.

1.3 Project Management Unit

The existing project coordination unit established at FONDOIN will continue its activities. However, FONDOIN will allocate one professional staff position on a full-time basis for maintaining technical, financial and statistical records to manage this phase-out program. The consultant will visit the plant on a regular basis, at least once every four weeks, to verify production logs.

2.4. Compensation to PRODUVEN

There are several tranches under the ExCom agreement which will be disbursed accordingly. A total of US\$3,200,000 will be disbursed to the enterprise as per the signing of the Grant Agreement with the Bank, and US\$100,000 will be disbursed to FONDOIN also as per signing of the Grant Agreement with the Bank.

US\$8.0 Million were approved to be disbursed to the enterprise in 2005, as per compliance with the 2004 production target. Additional \$100,000 approved by the Executive Committee would be disbursed to FONDOIN for the Technical Assistance component to be carried out by the GOV, also as per compliance with the 2004 production target.

For this Annual Plan 2005, a request of US\$8.1 Million is being made according to the Agreement between the GOV and the ExCom. These resources will be disbursed based on the accomplishments by PRODUVEN of the 2004 CFC production caps of the same agreement. These accomplishments were certified by an independent team of auditors, of which its report is annex to this plan.

ANNEX 1
PROPOSED ACTIVITIES IN THE 2005 ANNUAL PROGRAM

TABLE 1A: POLICIES AND REGULATIONS

Proposed policy/regulation	Estimate costs	Ministry/Agency to be in charge	Planned date of effectiveness
Banning of ODS Imports (Decree 3228 / 04)		Ministry of Environment and Natural Resources	Done (Nov 2004)
Production caps		Ministry of Environment and Natural Resources & FONDOIN	Accomplished in 2004 / Continuing during 2005

TABLE 1B TECHNICAL ASSISTANCE ACTIVITIES AND TRAINING ACTIVITIES

Name of TA/Training activity	Estimated costs	Duration
Supporting the GOV to strength technical capacity of local staff;	15,000	1 Year
Public Awareness	20,000	1 Year
Develop environmental guidelines for dismantling of the PRODUVEN's CFC production capacity	15,000	1 Year
Strengthening of Customs Office to prevent illegal traffic of CFCs	15,000	
Facilitating monitoring capabilities and compliance with the agreement between Venezuela and the Executive Committee of the MLF.	20,000	1 Year

TABLE 1C: PROJECT MANAGEMENT UNIT

Name of activity	Estimated costs	Duration
One professional staff full-time	15,000	1 Year

TABLE 1D: COMPENSATION TO PRODUVEN

Name of activity	Estimated costs	Duration
Compliance with 2004 production target	8,000,000	2005

ANNEX 2

Contact Agency/Organization and person in charge of managing the national import/export licensing system.

Ministerio del Ambiente y de los Recursos Naturales Dirección General de Calidad Ambiental

Sr. Douglas Marin, General Director

Phone: (58 212) 408 1116

Fax: (58 212) 408 1136

E-mail: fdiaz@marn.gov.ve

Address: Centro Simon Bolivar, Torre Sur, Piso 28,
Caracas, Venezuela

Fundación Fondo Venezolano de Reconversión Industrial y Tecnológica (FONDOIN)

Osmer Castillo, President

Phone: (58 212) 731 3932/2992

Fax: (58 212) 731 0015

E-mail: Fondoin@Cantv.Net

Address: Avenida Libertador Centro Comercial Los Cedros Piso 5
La Florida Sur - Apartado Postal 1050
Caracas, Venezuela

**AUDIT PROCESS FOR THE CLOSURE OF THE CFC PRODUCTION
SECTOR IN VENEZUELA (PRODUCTOS HALOGENADOS DE
VENEZUELA, C. A.; PRODUVEN) PLANT IN COMPLEJO
PETROQUÍMICO MORÓN, CARRETERA NACIONAL MORÓN-
CORO, MORÓN, ESTADO CARABOBO, VENEZUELA)**

**Prepared for:
WORLD BANK
FONDOIN**

Edited and critiqued by:
FAVogelsberg,Jr
World Bank Consultant on
China CFC Phaseout program and involved in Feb 24-28, 2002 audit of PRODUVEN Plant

Prepared by:

**Jorge Corona (Technical Consultant)
Dr. Juan de Dios Naveda (Certified Public Accountant; Naveda, Castillo & Asociados,
Venezuela)**

Caracas & México, D.F. , April 30, 2005

1. OBJECTIVE

To conduct an Audit on the production of CFCs at PRODUVEN in accordance to the Agreement for the Venezuelan Production Sector and the Guidelines of the Executive Committee for the Implementation of the Montreal Protocol (ExCom), with regards to monitoring CFC Production closure for the year 2004 according to the Terms of Reference supplied by the World Bank, the "Draft Guidelines and Standard Format for Verification of ODS Production Phase-Out", and in agreement with the documents signed by the Government of Venezuela with the ExCom during its 44th meeting in accordance with the schedule indicated below.

Table 1

Year	2004	2005	2006	2007	2008	TOTAL
Max. annual allowable production (MT)	4,400	2,913	2,913	0	0	10,226
TOTAL MLF grant (US\$ million)	3.30	8.1	1.75	2.3	1.05	16.50
PRODUVEN (*)	3.2	8	1.65	2.2	1	16.05
TA (FONDOIN)	0.1	0.1	0.1	0.1	0.05	0.45
Agency fees	0.2475	0.6075	0.1312	0.1725	0.0787	1.2375

Thus, the Audit had as its main purpose to certify that the production of CFC-11 plus CFC-12 during 2004 was lower than the amount agreed of 4,400 MT to comply with Venezuelan Government Commitment.

**Note:* PRODUVEN is the only manufacturer of CFC in Venezuela. No imports of CFC by PRODUVEN were reported in 2004.

In order to have precedents for this Audit, the results of the 2003 Audit are also considered, as well as the production of HCFC-22 in 2003 and 2004, although the CFCs were not yet controlled under the Agreement, and the production of HCFC-22 is still allowed by the Montreal Protocol for Article 5(1) countries. Venezuela did not exceed the maximum CFC production allowed for 2003 as per the Montreal Protocol control measures.

2. PERSONS CONTACTED

FONDOIN

Osmer Castillo
President

PRODUVEN

Carlos Cubeddu
Director General

Antonio Estrada
Plant Manager

Mauro G. Castro
Administration Manager

3. SUMMARY

Of the total 10,226 MT of CFC production PRODUVEN is committed to not exceed during the period 2004-2006, the target for 2004 is a maximum of 4,400 MT, of CFC-11 and CFC-12 (there are no other CFCs produced in Venezuela). PRODUVEN also produces HCFC-22 in the same equipment .HCFC-22 production is included in the present Audit to document the use of HF, which is feedstock for both.

In order to ascertain the compliance of PRODUVEN with the Agreement signed between the Venezuelan Government and the Executive Committee for the Implementation of the Montreal Protocol, an Audit was made by Jorge Corona (Technical Auditor, Chemical Engineer) and Juan de Dios Naveda (Certified Public Accountant), visiting the PRODUVEN plant located in the road Morón- Coro, in the State of Carabobo, Venezuela, on March 14 and 15, 2005.

It is important to mention that besides HF, the other important feedstock for producing CFC-11 and CFC-12 is CTC. PRODUVEN is the only importer of CTC, and all imports are used for CFC production. No CTC is sold as such. CTC imports are subject to very strict supervision by the authorities, mainly the "Ministerio del Ambiente y de los Recursos Naturales" (Ministry of Environment and Natural Resources). This Ministry has fixed a yearly import quota to PRODUVEN, in agreement with Article 3 of the Decree Num. 3,228 of 08/11/2004, about "Normative to Regulate and Control the Consumption, Production, Imports, Exports and Use of Ozone Depleting Substances". The product is controlled from the arrival to the port, Puerto Cabello, until it reaches the plant. CTC importers also require to be registered as Importers of Ozone Depleting Substances.

Due to record keeping required for CTC it is reasonable to accept the record of CTC purchases, adjusted for year end inventories of CTC in the CFC plant, as indicative of CFC

production in 2004, which was 3,564.73 MT, or 19% below the maximum allowable for 2004 (see details of the calculations in Items 5.0 and 7.0) This was confirmed during the Plant Visit (Item 4.1) and the Accounting Audit (attached). Therefore, it is concluded that PRODUVEN is in compliance with its Commitments with the ExCom for import and use of CTC and the indicative below target CFC 11/12 production in 2004. In round numbers the plant produced 289 MT of CFC-11 plus 3,267 MT of CFC-12 for a total CFC production of 3,566 MT, as well as 808MT of HCFC-22, by operating 179 days, or 50% of the calendar time. The combined 4,375MT of CFCs and HCFC-22 is roughly 40% of the plant's official capacity, if operated at the maximum daily rate. Therefore the reported production is in line with actual operating days. In view of the stringent controls on importation and use of CTC, as mentioned above, it would have not been possible for this facility to produce more than 3,844MT of CFCs even if the conversion were 100% of theoretical.

4. PLANT INSPECTION

PRODUVEN is a very well managed firm, and the plant visit was accompanied by Antonio Estrada, Plant Manager, who was very cooperative in supplying all requested information. The plant is in a very good working condition, and care is taken to follow good maintenance procedures.

Occasional leaks occur due to corrosion, and when this happens all equipment is sealed, pumps stopped, and precautions taken for workers safety. Of course, during plant shut downs, some unavoidable feedstock and finished products can be lost, even though the plant has a well designed equipment evacuation recovery system (this also happens when they swing from CFC to HCFC-22 production, which during 2004 occurred 4 times). The plant has not been modified since the beginning of 2003, except for normal maintenance practices.

4.1 Plant Visit

The plant was toured during the inspection and equipment layout verified using the plant's flow chart.

The Plant is designed as a "swing" plant capable of producing 12,000 MT of a 50/50 mixture of CFC-11 and CFC-12 or 6,000MT of HCFC-22. In 2002 the official Venezuelan government approved capacity was 9,000MT, assuming 2,500 MT of HCFC-22 and 6,500MT of a 20/80 CFC 11/12 ratio. The plant has one line and CFC-11 and CFC-12 are co-produced. To operate with a high CFC-12 ratio as was done in 2004 it is necessary to recycle unneeded CFC-11 back to the reactor .When producing CFC-11 and 12, the CTC and HF are fed from the large storage tanks to the process feed tanks, which are mounted on piezoelectric scales, and readings are made during production and at the beginning and end of the day to determine the amount of initial and final inventories and as an aid to process control

Cl_2 is added to sustain the catalyst, antimony pentachloride, (SbCl_5) in the fully oxidized state, as it tends to degrade to antimony trichloride (SbCl_3 which is not a catalyst for the reaction of $\text{CTC} + \text{HF} = \text{CFC-11} + \text{CFC-12} + \text{HCl}$, and also has the noxious effect to stick to the walls of the reactor, affecting heat exchange, and other problems.

No details of the distillation, purification and recovery of HCl will be given, however it is an important byproduct and its production and sale is also strictly supervised by the Authorities, because of its potential use by drug manufacturers

After neutralizing, drying and purifying the intermediate product, it is compressed and sent to the distillation columns. There are three of them. The first one is used only to produce HCFC-22 and it is made of stainless steel. In the second, CFC-12 is separated, and in the third CFC-11.

The day product receivers collect the refining system distilled CFC-12 and CFC-11 which are on piezoelectric scales that accurately measure the daily production. The figures for feedstock used and CFC produced are sent to the accounting department in the daily logs, and the figures reported are identical to the accounting books (see Control Room in item 4.2)

The measurements of the feedstock (CTC and HF) in the large tanks, is made through an external sight glass. Daily measurements made by operators, may have some inaccuracies, which are compensated for in the long run. At month end, the measurements are made by skilled personnel, accounting for the chemical vapors contained in the tank corrected for temperature and pressure, thus making the monthly consumption and production very accurate.

HCFC-22 is produced in the same reactor, using Chloroform and HF. One of the three distillation towers is made out of stainless steel, and is dedicated to HCFC-22 distillation.

4.2 Process Control Room

During the plant inspections, special attention was directed to the Process Control Room. The chief chemist, Rómulo Muñoz, explained the activities performed there, including quality control. In this room they have flow meters for important flows for reaction and distillation, as well as pressure and temperature indicators. However, the instantaneous readings cannot be extrapolated to calculate the day's raw material consumption or production values, as they are used for process control only and periodic flow rate changes occur throughout the day. Thus, these figures are not used to measure the CFC produced. These values must be obtained from the daily logs, which as mentioned, some were compared with accounting records and they were found to be accurate as reported. The Auditor claims that bookkeeping in PRODUVEN is in order, and he found no inconsistencies (see below Accounting Auditors Reports for 2003 and 2004).

4.3 CFC-13

Plants producing CFC-11 and CFC-12 produce very small amounts of CFC-13. Plant Chemists performed some tests using a gas chromatograph, on samples taken of the non condensable exhaust gases and the intermediate products, and the amounts of CFC-13 found were negligible (they found an almost undetectable peak in the graph, where CFC-13 was supposed to be found).

5.0 Summary of CFCs Production and Inventories Variation of Finished Products and Feedstock. Chemicals.

Year 2004(all figures are kilograms)

Finished Products	CFC-11	CFC-12	Total
Initial Inventory	55,546	107,041	162,587
Production	288,603	3,276,128	
Transfers for CFC-12 Production	43,238		
Used in the Plant		2,460	
Sales	299,950	3,267,333	3,567,283
Final Inventory	961	113,376	114,337

Feedstock	CTC (CCl₄)	HF
Initial Inventory	1,921,094	107,759
Purchases	2,914,999	1,846,740
Consumption for Production	4,790,285	1,807,995
Sales (if any)	0	11,471
Losses	39,208	8,413
Final Inventory	6,600	126,620

Feedstocks per Product	CFC-11	CFC-12
HF	46,536	1,199,084
CCL₄ (CTC)	347,298	4,442,987

CTC Purchases (year 2004)

July	1,000,014
October	1,010,935
November	216,620
December	<u>687,430</u>

Total **2,914,999**

YEAR 2003 (for reference purposes only, since the Agreement with the ExCom had not been signed at the time)

Finished Products	CFC-11	CFC-12	Total
Initial Inventory	130,419	444,038	574,457
Production	244,117	1,780,151	2,024,268
Transfer for CFC-12 production	114,871		
Recovered from returned sales		-346	
Sales	194,120	2,117,494	2,311,614
Final Inventory	55,545	107,041	162,586

Feedstocks	CTC (CCl₄)	HF
Initial Inventory	575,804	55,770
Purchases	4,010,543	1,025,720
Consumption for Production	2,651,763	955,276
Sales (if any)	0	14,396
Losses	13,490	4,059
Final Inventory	1,921,094	107,759

6.0 Reasons for Considering CTC Imports and Consumption as the “Key Factor” to Verify CFC-11 and CFC-12 production by PRODUVEN.

As mentioned earlier, PRODUVEN is the only importer of CTC in Venezuela, and all of it is used for CFC production (they are not allowed to sell it). Besides the requirement of being registered in the “Registry of Imports of Ozone Depleting Substances”, where they have an annual quota which allows them to get import permits from the “Ministerio del Ambiente y de los Recursos Naturales” (Ministry of Environment and Natural Resources) according to the “Norms to Regulate the Consumption, Production, Imports and Use of Ozone Depleting Substances”, established in the “Decree Num: 3,228 of 08/11/2004”, they are also controlled by the “CADIVE”, depending from the “Finance Ministry”, which controls the amount of dollars required for any transaction including the amount of product imported. There is also the Customs Control”, and the “National Guard” also supervises the application of the product, because of its potential use to extract psychothropic agents.

Because of the above mentioned controls, the following has to be taken into account: The stoichiometric ratio of CTC/CFC-11 is 1.12 and that of CTC/CFC-12 is 1.27. In actual production at the plant, because of efficiency and losses, the CTC/CFC-11 ratio is 1.21 and the CTC/CFC-12 ratio is 1.37. This falls within the common ratios in other CFC manufacturing plants Since CFC-11&12 are co produced at the same time there is no

measurement of CTC consumed in each species. The reported consumptions are calculations to assure a reasonable allocation of the CTC to each CFC produced. Based on this allocation the CTC yields to CFC-11 and CFC-12 are 92.6% and 92.7% of theoretical, respectively for 2004.

7.0 Conclusions

Taking into account all mentioned considerations, it is possible to confirm that the reported production of CFC-11 of 288.6 MT plus CFC-12 of 3,276.13 MT, totaling 3,564.73 for the year 2004 are correct and 835.27MT or 19% below the maximum allowable amount of 4,400 MT.

The amounts of CFC-11 and 12 produced and amounts of raw materials consumed during 2003 and 2004 can be seen in the Accounting Auditors Report, and in more detail in the Annex I attached. The figures on HCFC-22 are reported outside Annex I, as this report makes reference to CFCs only.

YEAR 2003 ACCOUNTING AUDIT OF PRODUVEN

Attention:
 EXECUTIVE COMMITTEE OF
 THE MULTILATERAL FUND FOR THE
 IMPLEMENTATION OF THE MONTREAL PROTOCOL

We have performed the audit. Corresponding to the period from 01/01/2003 with respect to Sales, Production, Raw Materials Consumption, Inventories Control of Finished Products and Raw Materials Purchases, in PRODUVEN plant located on the National Road Moron-Coro, Km 1 at the Petrochemical Complex Morón in the State of Carabobo, registered in the "Registro de Información Fiscal" under the number J-00077526-5, referring to the products denominated "Refrigerante 11, 12 and 22" (Technical Names (CFC-11, CFC-12, and HCFC-22). Our Audit was made according to the Generally Accepted Accounting Rules, and therefore included those tests of the accounting registries and all other audit procedures deemed necessary according to the circumstances, obtaining the following results:

Monthly CFC-11 production and raw material consumption (Kg)

CFC-11 production and CTC consumption: (Yearly CTC/CFC-11 ratio=1.20, for a 93.3 % of theoretical yield.)

Month	CFC-11	No. Of operating days	CFC-11 Production	CTC/CFC-11 Ratio	CTC Opening Stock	CTC Consumption	CTC Closing Stock
Jan			0,000			0,000	
Feb			0,000			0,000	
Mar		12	30,375	0,99		29,931	
Apr			0,000			0,000	
May		5	23,251	1,29		29,919	
Jun		7	46,295	1,23		57,105	
Jul		5	33,017	1.18		39,098	
Aug			0,000			0,000	
Sept		9	36,054	1.17		42,342	
Oct			0,000			0,000	
Nov			0,000			0,000	
Dec		13	75,125	1.26		94,339	
TOTAL			244,117			292,734	

CFC Production and HF consumption:

Month	CFC-11	No. Of operating days	CFC-11 Production	HF/ CFC-11 Ratio	HF Opening Stock	HF Consumption	HF Closing Stock
Jan			0,000			0,000	
Feb			0,000			0,000	
Mar		12	30,375	0,15		4,417	
Apr			0,000			0,000	
May		5	23,251	0,16		3,697	
Jun		7	46,295	0,17		7,799	
Jul		5	33,017	0,16		5,349	
Aug			0,000			0,000	
Sept		9	36,054	0,18		6,315	
Oct			0,000			0,000	
Nov			0,000			0,000	
Dec		13	75,125	0,19		14,440	
TOTAL			244,117				

Monthly CFC-12 production and raw material consumption (kg)

CFC-12 Production and CTC consumption: (CTC/CFC-12 ratio of 1.26 or 100% of theoretical yield)

Month	CFC-12	No. Of operating days	CFC-12 Production	CTC/ CFC-12 Ratio	CTC Opening Stock	CTC Consumption	CTC Closing Stock
Jan			0,000			0,000	
Feb			0,000			0,000	
Mar		12	297,562	1,12		333,011	
Apr			0,000			0,000	
May		5	132,902	1,46		194,223	
Jun		7	180,681	1,40		253,115	
Jul		5	121,213	1,34		163,018	
Aug		8	204,731	1,32		270,784	
Sept		9	229,648	1,33		306,306	
Oct		11	279,473	1,30		362,312	
Nov			0,000			0,000	
Dec		13	333,941	1,43		476,260	
TOTAL			1,780,151			2259,029	

CFC Production and HF consumption:

Month	CFC-12	No. Of operating days	CFC-12 Production	HF/ CFC-12 Ratio	HF Opening Stock	HF Consumption	HF Closing Stock
Jan			0,000			0,000	
Feb			0,000			0,000	
Mar		12	297,562	0.33		98,103	
Apr			0,000			0,000	
May		5	132,902	0.36		47,904	
Jun		7	180,681	0.38		69,005	
Jul		5	121,213	0.37		44,519	
Aug		8	204,731	0.35		71,976	
Sept		9	229,648	0.40		91,191	
Oct		11	279,473	0.35		98,673	
Nov			0,000			0,000	
Dec		13	333,941	0.44		145,523	
TOTAL			1,780,151				

Monthly HCFC-22 production and raw material consumption (kg)

HCFC Production and Chloroform Consumption:

Month	HCFC-22	No. Of operating days	HCFC-22 Production	Chloroform HCFC-22 Ratio	Chloroform Opening Stock	Chloroform Consumption	Chloroform Closing Stock
Jan			0,000			0	
Feb			0,000			0	
Mar			0,000			0	
Apr		5	77,002			159.1	
May		2	33,473			48.3	
Jun		1	12,317			30.2	
Jul		3	52,913			74.3	
Aug			0,000			0	
Sept		8	123,090			198.1	
Oct		2	30,989			53.5	
Nov			0,000			0	
Dec		7	113,657			190.5	
TOTAL			443,441				

HCFC-22 Production and HF consumption:

Month	HCFC-22	No. Of operating days	HCFC-22 Production	HF/ HCFC-22 Ratio	HF Opening Stock	HF Consumption	HF Closing Stock
Jan			0,000			0,000	
Feb			0,000			0,000	
Mar			0,000			0,000	
Apr		5	77,002	0,74		56,680	
May		2	33,473	0,41		13,750	
Jun		1	12,317	0,74		9,057	
Jul		3	52,913	0,49		26,052	
Aug			0,000			0,000	
Sept		8	123,090	0,60		74,002	
Oct		2	30,989	0,46		14,317	
Nov			0,000			0,000	
Dec		7	113,657	0,46		52,509	
TOTAL			443,441				

It is our opinion that according to the indicated analysis we can determine that PRODUVEN C.A. keeps an adequate control of the abovementioned points.

(We would like to make reference to the attached "Annex 1" for the complete figures of Products and Raw Materials Stocks. Some figures may differ because of the reporting requirements of the Annex, since it is difficult to discriminate Raw Materials consumptions for the different products, when most of them are common to all reported products, stored in the same tanks, and used in the same reactors, and for the case of CFC-11 and CFC-12, simultancously).

NAVEDA CASTILLO & ASOCIADOS

Lic. Juan de Dios Naveda
 CONTADOR PUBLICO COLEGIADO
 (Registered Public Accountant)

C.P.C. 7.431

YEAR 2004 ACCOUNTING AUDIT OF PRODUVEN

Attention:
EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL

We have carried out the accounting audit corresponding to the period from 01/01/2004 to 31/12/ 2004, taking into account Sales, Production of CFC-11 and CFC-12, Raw Materials Consumed, Opening and Closing Stocks of Raw Materials and Finished Products and Purchases, in the PRODUVEN Plant (Productos Halogenados de Venezuela C.A.), which is located on "Carretera Nacional Morón Coro Kilómetro 1 Complejo Petroquímico Morón" in the State of Carabobo, Venezuela, registered under the Number J-00077526-5 in the "Registro de Información Fiscal", in what respects to the products Refrigerante-11, 12 and 22 (CFC-11, CFC 12 and HCFC-22 in the worldwide accepted nomenclature). Our Audit was made under the generally accepted accounting practices and therefore included those tests of the accounting registers and all other auditing principles considered necessary according to the circumstances.

Our revision was extended to the accounting registers, production reports and Financial Statements. To satisfy the object of this Audit, we included the product HCFC-22, to have 100% control of raw materials consumed. Random tests of production reports were executed.

It is important to point out that the main objective of the audit was to verify the compliance of PRODUVEN with its commitments with the Agreement with the Executive Committee of the Multilateral Fund for the Montreal Protocol, which for the year 2004 sets a production limit of CFC-11 plus CFC-12 of 4,400 MT. The following were the audits results:

CFC & HCFC-22 Sales, Year 2004 (kg)

Month	HCFC-22	CFC-11	CFC-12
Jan	0	8,000	250,360
Feb	165,130	5,080	91,310
Mar	62,140	35,000	208,120
Apr	16,780	6,000	190,499
May	23,458	26,000	198,825
Jun	65,438	7,440	195,225
Jul	93,020	16,800	252,820
Aug	81,496	7,640	195,509
Sept	109,050	13,840	220,316

Oct	51,498	3,440	285,680
Nov	7,800	35,730	292,492
Dec	132,200	134,980	886,177
Total	808,010	299,950	3267,333

Monthly CFC-11/12 and HCFC-22 production and raw material consumption (kg)

CFC Production and CTC and HF consumption: (Using figures from the 2004 data tables it is possible to arrive at the following ratios and yields for CTC to respective CFC species. 1.158 CTC/CFC-11 ratio or a 103.6 % of theoretical yield and a 1.36 CTC/CFC-12 ratio or a 93.4%of theoretical yield. In view of the low volume of CFC-11 vs CFC -12 produced in 2004 and knowing that the CTC allocation is arbitrary this is not disturbing since on balance the overall yield from CTC to both CFCs is normal.)

Month	CFC-11	No. of operating days	CFC-11 Production	CTC Consumption	HF Consumption
Jan		0	0,000	0,000	0,000
Feb		0	0,000	0,000	0,000
Mar		17	56,576	67,384	9,228
Apr		15	24,230	28,944	3,813
May		8	5,556	6,747	0,905
Jun		0	0,000	0,000	0,000
Jul		18	40,766	48,747	6,745
Aug		7	11,741	14,898	1,740
Sept		0	0,000	0,000	0,000
Oct		8	18,905	23,177	3,241
Nov		19	38,321	46,571	5,959
Dec		21	92,508	110,830	14,905
TOTAL		113	288,603	347,298	46,536

Monthly CFC-11/12 and HCFC-22 production and raw material consumption (Kgr)

CFC Production and CTC and HF consumption:

Month	CFC-12	No. of operating days	CFC-12 Production	CTC Consumption	HF Consumption
Jan		9	249,619	296,135	95,799
Feb		0	0,000	0,000	0,000
Mar		17	481,629	651,494	178,099

Apr		15	402,623	546,232	143,625
May		8	220,343	303,893	81,333
Jun		0	0,000	0,000	0,000
Jul		18	472,307	641,424	177,160
Aug		7	184,887	266,429	62,127
Sept		0	0,000	0,000	0,000
Oct		8	220,501	307,009	85,716
Nov		19	489,013	674,939	172,415
Dec		21	555,206	755,432	202,810
TOTAL		122	3,276,128	4,442,987	1,199,084

Monthly CFC-11/12 and HCFC-22 production and raw material consumption (Kgr)

CFC Production and CTC and HF consumption:

Month	HCFC-22	No. of operating days	HCFC-22 Production	CTC Consumption	HF Consumption
Jan		8	143,082	0,000	76,098
Feb		12	212,071	0,000	126,620
Mar		3	45,041	0,000	20,809
Apr		0	0,000	0,000	0,000
May		1	5,852	0,000	2,703
Jun		8	134,794	0,000	80,375
Jul		3	51,939	0,000	31,226
Aug		7	128,360	0,000	77,170
Sept		10	182,045	0,000	104,116
Oct		5	90,625	0,000	49,154
Nov		0	0,000	0,000	0,000
Dec		0	0,000	0,000	0,000
TOTAL		57	993,809	0,000	568,271

Finished Products (CFCs) (Kgr)

	CFC-11	CFC-12	HCFC-22
Opening stock	55,546	107,041	63,789
Production	288,603	3,276,128	993,809

Transfers for CFC-12 Prod. Used in Plant	43,238		
		2,460	
Sales	299,950	3,267,333	808,010
Closing Stock	961	113,376	249,498

Raw Materials (kg) (The loss of 39,208 kg of CTC represents only .082% of CTC handled and very realistic)

	CTC	HF
Opening stock	1,921,094	107,759
Purchases	2,914,999	1,846,740
Consumption for production	4,790,285	1,807,995
Sales	0,000	11,471
Losses	39,208	8,413
Closing Stock	6,600	126,620

CTC Purchases during Year 2004 (kg)

	CTC
Jul	1,000,014
Oct	1,010,935
Nov	216,620
Dec	687,430

In our opinion, according to the above mentioned analysis, we can certify that the Firm PRODUVEN complied during the period with the Agreement with the Montreal Protocol, where maximum CFC production quota of 4,400 MT is specified, whereas the production during year 2004 was of 3,564.7 MT.

Atentamente.
NAVEDA CASTILLO & ASOCIADOS

Lic. Juan de Dios Naveda
 CERTIFIED PUBLIC ACCOUNTANT
 C.P.C. 7.431