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

**PROJECT PROPOSALS: MEXICO**

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

Phase out

- National CFC phase-out plan: 2<sup>nd</sup> tranche

UNIDO and  
World Bank

Production

- Sector plan for phasing out CFC-11 and CFC-12 production sector:  
third tranche

UNIDO

**PROJECT EVALUATION SHEET  
(MULTI-YEAR PROJECTS)  
MEXICO**

<b>PROJECT TITLE</b>	<b>BILATERAL/IMPLEMENTING AGENCY</b>
National CFC phase-out plan: 2 <sup>nd</sup> tranche	UNIDO and World Bank

<b>NATIONAL CO-ORDINATING AGENCY:</b>	SEMARNAT
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**LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT****A: ARTICLE-7 DATA (ODP tonnes, 2003, as of May 2004)**

Annex A Group I, CFCs	1,989		

**B: COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes, 2003, as of May 2004)**

ODS	Aerosol	Foam	Ref. mfg.	Ref. Service	Process Agent	TOTAL
CFC-11	0	137	10		0	147
CFC-12	70	55	30	1,634	0	1,789
CFC-113	0				33	33
CFC-114	0			20	0	20
CFC Total	70	192	40	1,654	33	1,989

<b>CFC consumption remaining eligible for funding (ODP tonnes)</b>	n/a
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**CURRENT YEAR BUSINESS PLAN:** Total funding US \$5,351,350: total phase out 40 ODP tonnes

PROJECT DATA		2004	2005	2006	2007	2008	2009	2010	Total
<b>CFCs (ODP tonnes)</b>	Montreal Protocol limits	4,625	2,312	2,312	694	694	694	0	n.a.
	Annual consumption limit	4,403	2,205	150	50	50	50	0	n.a.
	Total demand (reference)	1,932	1,667	1,190	725	425	195	140	6,274
	Annual phase-out from ongoing projects	40	165	77	15	0	0	0	297
	Annual phase-out newly addressed	0	100	400	450	300	230	55	1535
	Annual unfunded phase-out	0	0	0	0	0	0	0	0
<b>TOTAL ODS CONSUMPTION TO BE PHASED OUT</b>		<b>40</b>	<b>265</b>	<b>477</b>	<b>465</b>	<b>300</b>	<b>230</b>	<b>55</b>	<b>1832</b>
Final Project costs (US\$):									
	Funding for UNIDO	3,517,000	4,478,000	299,500	0	0	0	0	8,294,500
	Funding for World Bank	0	500,000	0	0	0	0	0	500,000
	<b>Total project funding</b>	<b>3,517,000</b>	<b>4,978,000</b>	<b>299,500</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,794,500</b>
Final Support cost									
	Support cost for UNIDO	263,775	335,850	22,463	0	0	0	0	622,088
	Support cost for World Bank	0	37,500	0	0	0	0	0	37,500
	<b>Total support costs</b>	<b>263,775</b>	<b>373,350</b>	<b>22,463</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>659,588</b>
	<b>TOTAL COST TO MULTILATERAL FUND (US\$)</b>	<b>3,780,775</b>	<b>5,351,350</b>	<b>321,963</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,454,088</b>
	Final project cost effectiveness (US \$/kg)								5.26

\*2004 consumption data are provisional

**FUNDING REQUEST:** Approval of funding for 2nd tranche (2005) as indicated above.

<b>SECRETARIAT'S RECOMMENDATION</b>	<b>Individual consideration</b>
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## PROJECT DESCRIPTION

1. On behalf of the Government of Mexico, UNIDO has submitted to the 45<sup>th</sup> Meeting of the Executive Committee a request for the second tranche of the National CFC phase-out plan for Mexico. The request was accompanied by a two-part document, with the sub-titles "Part 1: Achievement of the previous annual programme" and "Part 2: Annual Implementation Programme; Second Tranche".
2. The Agreement for the National CFC phase-out plan for Mexico was originally approved at the 42<sup>nd</sup> Meeting of the Executive Committee in 2004, with an associated level of funding of US \$8,794,500. Through this Plan, the Government of Mexico intended to achieve a phase out of its CFC consumption to 3.2% of its baseline in 2006, 1.1% in 2007 and a complete phase out by the end of 2009, starting at a consumption level of 4,403 ODP tonnes in 2004.
3. The Agreement between the Executive Committee and Mexico foresees that the Executive Committee will not provide the funding in accordance with the Funding Approval Schedule unless the Country satisfies the following conditions:
  - (a) That the country has met the target for the applicable year;
  - (b) That the meeting of the target has been independently verified;
  - (c) That the country has substantially completed all actions set out in the last Annual Implementation Programme; and
  - (d) That the country has submitted and received endorsement from the Executive Committee for an annual implementation programme in respect of the year for which funding is being requested.
4. UNIDO reported preliminary data for the consumption in 2004, which was well below the maximum allowable consumption for 2004. UNIDO informed the Secretariat that because of the submission deadline being early February 2005, it was not possible to submit a verification audit.
5. UNIDO reported about the progress in implementation of the 2004 Annual Implementation Programme. The comparison between the planned activities in the last annual implementation programme approved in 2004 and the activities carried out shows significant discrepancies. The awareness campaign planned for 2004 and the training programmes for refrigeration technicians have not yet been implemented. The activities planned for 2004 had associated expenditures of US \$3,517,000, of which US \$435,251 (12.4%) were actually obligated or spent until February 2005.
6. UNIDO included, with the submission of the funding request for the National CFC phase-out plan for Mexico, the 2<sup>nd</sup> tranche of the annual implementation programme for 2005. The annual implementation programme, submitted by UNIDO on behalf of Mexico, is following in principle the format provided in the agreement between Mexico and the Executive Committee.

Of the US \$4,978,000 foreseen for the 2005 programme, US \$1,378,000 (27.7%) are planned for a national project for training of service technicians, US \$2,500,000 (50.2%) for a national refrigerant recovery and recycling project, and US \$500,000 (10.0%) for an incentive programme for retrofitting and replacement of chillers, to be implemented by the World Bank. Certain characteristics of the different activities need to be taken into account:

- (a) The national project for training of service technicians planned for 2005 is a continuation of a 2004 programme. In 2004, the funding foreseen for this activity was US \$1,928,300, of which only 14% had been disbursed. The total funding foreseen for this particular activity in 2004 and 2005 amounts to 37.6% of the total funds approved in principle for the National Plan. The project document and annual plan do not specify in detail what activities are intended with this funding.
- (b) The national refrigerant recovery and recycling project planned for 2005 is a continuation of a 2004 programme. In 2004, the funding foreseen for this activity was US \$600,000, of which 3.1% had been disbursed. The total funding foreseen for this particular activity in 2004 and 2005 amounts to 35.2% of the total funds approved in principle for the National Plan. The project document and annual plan do not specify in detail what activities are intended with this funding.
- (c) The chiller component to be implemented by the World Bank is the second phase of a project approved by the 28<sup>th</sup> Meeting of the Executive Committee, and is modeled using the experience from this first phase. In the first phase, it was planned to address ten chillers and eliminate five tonnes of CFC. The first phase achieved more than originally planned, addressing twelve chillers, and eliminated 7.8 ODP tonnes. For the second phase, five chiller owners have already been identified, and discussions are ongoing with several more. The World Bank named a number of organizational activities to be conducted under the project, such as evaluation of projects, selection of equipment, management of finances, and ensuring recycling of CFCs and destruction of equipment. The World Bank was originally not mentioned in the Agreement between Mexico and the Executive Committee. Upon request of the Secretariat, UNIDO provided a written request from the Government of Mexico stating the desire to have the chiller component implemented by the World Bank. On the basis of a proposal submitted by the World Bank to the 41<sup>st</sup> Meeting, the Executive Committee endorsed in decision 42/10 that the implementation of this activity would be subsumed into the countries national implementation plan.

## **SECRETARIAT'S COMMENTS AND RECOMMENDATION**

### **COMMENTS**

7. At the time of writing this document, three of the four preconditions for approval of annual tranches as cited in paragraph 3 above are not considered as fulfilled, namely, the condition of verification, the implementation of the previous year's annual programme, and the

presentation of an approvable annual implementation programme for the current year. The issues related to those conditions which have not been met are being examined in the following paragraphs:

- (a) *Verification of consumption:* The verification of consumption targets requires, in the case of Mexico as a CFC producing country, the verification of production, imports and exports. Because of certain characteristics of the production sector agreement, Mexico is stockpiling a large amount of its production for future use; the additions to the stockpiles are according to the Montreal Protocol definitions part of the consumption in the year they are produced. UNIDO, being also responsible for the production sector project in Mexico, was able to submit a report for the 2004 production figures including their verification. The production and consumption sector phase-out objectives are well co-ordinated, thus the meeting of the production sector targets as well as detailed, unverified CFC sales and export data in the production report provide an indication that the consumption sector targets have been met as well.
- (b) *Implementation of the previous year annual programme:* The very low disbursements of the annual implementation programme for 2004, as well as the content of the reporting, indicates that the country has not substantially completed all actions as required. In the extended desk study on the evaluation of national phase-out plans, the senior evaluation officer points out that “disbursement is and should be tied to meaningful activities indicated in annual programmes, and the frontloading of most agreements should not result in a rush of spending for insufficiently prepared equipment intensive activities.” The Secretariat would like to point out that the decision of Mexico and UNIDO to consider carefully and proceed slowly with spending the funds for CFC phase out is, in the situation of Mexico, likely to be the most appropriate way forward.
- (c) *Approval-ready annual implementation programme for the current year:* The annual implementation programme for 2005 has two components: One component, implemented by the World Bank, is targeted to chillers, the other one, implemented by UNIDO, at the refrigeration-servicing sector and small and medium sized refrigeration systems.
  - (i) Approval for the chiller component of the project, implemented by the World Bank, had been sought as a stand-alone project 18 months ago as a second phase of an ongoing project. This second phase has been on hold since the 41<sup>st</sup> Meeting. The project description is detailed, and it is obvious both from the previous implementation experience as well as from the documentation submitted to the Secretariat what activities are planned, who is responsible, and who will be the beneficiaries. The Secretariat recommends this activity for approval without additional conditions.
  - (ii) At the time of writing of this document, the other component of the annual implementation programme to be implemented by UNIDO and targeted at the refrigeration-servicing sector is less well documented. The Secretariat

believes that the second annual implementation programme represents an important milestone, since country and agency had the opportunity to discuss matters, fill information gaps and update and complete the strategy of the original plan during the first year of implementation, having the benefit of exact knowledge of the available funding. Consequently, the programme presented should contain:

- in relation to the overall phase-out plan (insofar as not already contained in the project proposal) exact information about the roles of the stakeholders in the implementation process, including the description of responsibilities. A brief version of an overall assessment should also be provided consisting of the various potential activities and their contribution to a complete phase out as well as a list of all activities foreseen until 2010, their approximated funding requirements, a clarification of implementation management issues such as who are the beneficiaries, how much support they should receive, as well as a preliminary implementation schedule; and
- In relation to the annual planning, the list of activities planned and their anticipated funding requirements, as well as milestones and completion dates for each activity, characteristics of the beneficiary group such as location, size, method of identification of beneficiaries and delivering benefits.

8. In light of the US \$3.081 million funding remaining in UNIDO's accounts related to the last year's tranche, equalling 88% of the original funding, the Secretariat believes that no funding should be disbursed by UNIDO before a sufficient annual implementation programme has been submitted.

## **RECOMMENDATION**

9. In light of the explanations above, the Executive Committee might wish to consider deferring consideration of the request for the 2005 tranche of the National CFC phase-out plan for Mexico, until the conditions specified in the Agreement between Mexico and the Executive Committee have been met.

10. Alternatively, the Executive Committee might wish to consider:

- (a) noting with appreciation that Mexico has reported that the actual consumption in the country was substantially lower than the 4,403 ODP tonnes defined as maximum allowable consumption for 2004 in the agreement;
- (b) deciding to amend the agreement between Mexico and the Executive Committee to include the World Bank as co-operating implementing agency, as requested by Mexico;

- (c) approving funding of US \$4,978,000 for the second tranche of the National CFC phase-out plan for Mexico as follows:
  - (i) US \$500,000 plus US \$37,500 in support cost for the World Bank, to be utilized specifically for a chiller activity in Mexico; and
  - (ii) US \$4,478,000 plus US \$335,850 in support cost for UNIDO.
- (d) noting that disbursement of the funding approved for UNIDO under subparagraph (ii) above should not commence until agreement between the Secretariat and UNIDO has been reached that the following conditions are being met:
  - (i) Verification of the 2004 consumption and related annual phase out has been completed through the provision of an appropriate verification report; and
  - (ii) Submission of a satisfactory Annual Implementation Programme for 2005, taking into account the funding carried over from the first tranche, including a detailed description of responsibilities of the different stakeholders in the implementation as well as a detailed list of activities.
- (e) requesting the Secretariat to inform the Executive Committee about the progress achieved at its 46<sup>th</sup> Meeting as part of the report on implementation of approved projects with specific reporting requirements.

**SECTOR PLAN FOR PHASING OUT CFC-11 AND CFC-12 PRODUCTION SECTOR:  
2004 AUDIT REPORT AND 2005 ANNUAL IMPLEMENTATION PROGRAMME**

**Background**

11. The Executive Committee at its 40<sup>th</sup> Meeting in 2003 approved in principle a total of US \$31.85 million for the implementation of the Agreement for the Mexican CFC production sector, and disbursed the first tranche of US \$5.3 million to the project. Under the Agreement, the Government of Mexico is committed to a dual condition of a maximum level of total CFC production of 22,000 mt for the period 2003-2005, and at the same time not exceeding the maximum allowable production limit specified in the Agreement for each of the three years. Subsequently the Executive Committee released the 2004 tranche of funding of US \$10.7 million at its 42<sup>nd</sup> Meeting after a satisfactory verification of the 2003 CFC production that confirmed that the country produced 8,694 mt of CFC-11 and CFC-12 in 2003 and therefore met the two conditions specified in the agreement.

12. The essential elements of the Agreement are presented in the following table.

Country	Mexico
Project title:	Sector Plan for Phasing out CFC-11 and CFC-12 Production Sector
Year of plan	2005
# of years completed	2
# of years remaining under the plan	2
Maximum Allowable CFC Production between 2003-05	22,000 mt
Maximum Allowable Annual CFC Production in 2003 and 2004	12,355 mt
Actual CFC production in 2003	8,694 mt
Actual CFC production in 2004	8,044 mt
Maximum Allowable 2005 production proposed	5,262 mt
Total funding approved in principle for the CFC phase-out plan	US \$31.85 million
Total funding released as of Dec. 2004	US \$16 million
Level of funding requested for 2005 Annual Plan	US \$4.0 million

13. In accordance with the conditions of the agreement that the release of the funding tranches subsequent to 2003 requires the submission by UNIDO of the independent verification



of the production in the preceding year to be within the Montreal Protocol requirement and within the total allowable production limits of the Agreement, together with a work programme for the relevant year, UNIDO is submitting the verification of the 2004 CFC production in Mexico and the 2005 annual work programme at a funding level of US \$4.0 million plus US \$300,000 as support cost.

#### Verification of the 2004 CFC production in Mexico

14. The verification was carried out in January 2005 by Ess Jay Consultants, the same consulting firm which had performed the 2003 verification. The report included an executive summary, the report itself and the data presented in the format prescribed in the guidelines for verifying ODS production phase-out approved by the Executive Committee in 2000. The report first described in brief the history of the CFC plant Quimobasicos, which has two production units with capability to produce CFCs and HCFC-22. However due to the insufficient demand for CFCs and the relatively long and uneconomical mode of switching between the two product series, only one plant has continued producing CFCs since 1995 while the other is dedicated to HCFC-22 production. The verification team covered only the unit which has been dedicated to CFC production, and visited the HCFCs plant only to confirm that it produced HCFCs. The plant was reported to be continuing its test in 2004 to produce CFC-12 only by recycling CFC-11, presumably due to the decrease in the demand for CFC-11.

15. The verification team was reported to have access to all the plant premises and the documents needed for the exercise, including raw material purchase and issue records; daily production logs; stock transfer and records for storage; sales invoices; monthly VAT returns filed with revenue authority; and import quotas and actual imports of CTC and HF. The auditors randomly selected days from 4 months of the year as samples for checking. The team started by auditing the opening stock of CFC-11 and CFC-12, and the volumes of CTC and HF for feedstock from the financial records and the records of the warehouse for the year 2004. Then the report described the verification of the consumption of raw materials by checking the list of purchases from the finance department and cross-checking with a select number of invoices. There was a description of the process of daily production and movement of the finished product within the plant, the recording of actual production, the net production and the filling losses. The raw material consumption ratio was also checked against the historic record and industry norms and was reported as acceptable.

16. There was then the examination of the packaging of CFC products and a description of the process followed in the plant. There was a sample check of the accounting records of the packages, a check on the weight of the different packages, and of the gas quality through gas chromatography. The verification finally examined the sales records and the closing stock of CFC products and the feedstock. The report also included 7 annexes with copies of the original records that had been examined.

17. The results of the verification were that Quimobasicos produced 8,044 mt of CFCs in 2004 which was broken down into 1,177 mt of CFC-11 and 6,867 mt of CFC-12. This was below the annual maximum allowable production level of 12,355 mt, and after deducting the 8,694 mt produced in 2003 and the 8,044 mt produced in 2004 from the total maximum allowable production of 22,000 mt for 2003-2005, the remaining maximum allowable production for 2005

would be 5,262 mt. The plant recorded 23 mt as filling losses but accounted for the losses in the total allowable production. The total sales of CFCs by the plant in 2004 were 6,029 mt, which was broken down into 1,049 mt for domestic sales and 4,980 mt for export.

18. The data collected by the verification team are presented using the format 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 in CTC and HF for feedstock as a way of validating the CFC production.

#### The 2005 work programme

19. The 2005 work programme includes three parts, a project summary, 2004 annual work programme achievements and the objectives and activities of the 2005 work programme. The project summary includes the target and funding level for the 2005 work programme. A maximum allowable production level of 5,262 mt of CFCs is the target for the 2005 annual programme after deducting the actual productions in 2003 and 2004 from the maximum allowable production of 22,000 mt for the three years 2003-2005, as set in the agreement. The implementation of the 2005 programme requires a funding level of US \$4.0 million and US \$300,000 as support cost.

20. The 2004 work programme reported the achievement of a total CFC production of 8,044 mt by Quimobasicos, which was below the annual maximum allowable production of 12,355 mt prescribed in the Agreement. Of the US \$10.7 million disbursed for the 2004 work programme, US \$10.6 million was disbursed as compensation to Quimobasicos and the balance was allocated to technical assistance activities to be implemented by the government. There were a number of policy measures which were planned and implemented in 2004 to facilitate the implementation of the CFC production phase-out. This included a legally enforceable production quota system for CFC producers, which was introduced in January 2004. At the same time, the Government initiated the process to introduce a detailed regulation to gradually ban the use of CFCs in all sectors, and the production and import of CFC-containing equipment. The Government was promoting an agreement among the importers to ban the imports of CFCs and use CFCs stockpiled between 2003-2005.

21. The programme continued to monitor the production of Quimobasicos through mandatory reporting by CFC producers to the national ozone unit, periodic visits by government officials to CFC producers, and penalty clauses for exceeding the production quota or providing false information. A number of technical assistance activities which started in 2003 continued in 2004, including public awareness campaigns, training of CFC traders and customs officers, and establishing an information management system.

22. The 2005 target of a maximum allowable production level of 5,262 mt will be implemented through a mandatory CFC production quota introduced in January 2004 and the control on the import of CTC. The plant intends to complete the quota by the middle of the year and switch to HCFC production after that. On the basis of the consumption ratio of CTC to the production of CFC-11 and CFC-12, the Government of Mexico will authorize a maximum import quota of CTC of 9,300 mt in 2005. Of the total US \$4.0 million being requested for

2005, US \$3.81 million will be disbursed to Quimobasicos for keeping to the production quota, and the balance of US \$0.19 million will be allocated to technical assistance activities. The programme proposes a number of technical assistance activities, including setting up an ODS information management system, and activities which would assist in the implementation of the CFC national phase-out plan. The 2005 work programme concludes with a time schedule and estimated costs of the technical assistance activities for 2005 and 2006.

### **Comments**

23. The 2005 work programme proposes 5,262 mt as the maximum allowable CFC production in Mexico, which is the quota remaining from the 22,000 mt for the 3-year duration of 2003-05 after deducting the actual production in 2003 and 2004.

24. It is noted that the Government of Mexico is planning further policy measures for 2005, which include the gradual ban on CFCs in all sectors, the ban on the CFC-containing equipment and the ban on CFC imports. The initiatives would facilitate the CFC production closure project as well as the CFC national phase-out programme, which is also under implementation.

25. The verification of the 2004 CFC production at Quimobasico is carried out in accordance with the guidelines of the Executive Committee on verifying ODS production phase-out, and contains reasonable description of the methodology and documentation examined to confirm the achievement of the annual production reduction targets. The current verification also implemented the decision of the Executive Committee when approving the 2004 annual programme and included a financial consultant in the audit team.

26. In accordance with the practice of presenting the verification reports of CFC production phase-out, the Secretariat includes only the aggregate data and not the annexes or the monthly data on production and feedstock consumption. However the annexes and the monthly data could be made available to any member of the Executive Committee upon request.

### **Recommendations**

27. The Secretariat recommends that in light of the satisfactory verification indicating that the Mexico CFC production closure programme had achieved the CFC production reduction target in 2004 as set out in the agreement, the Executive Committee may wish to approve the 2005 work programme of the Mexican CFC production phase-out agreement at US \$4.0 million and US \$300,000 as support cost for UNIDO.

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**PROJECT COVER SHEET – MULTI-YEAR PROJECTS**

**COUNTRY: MÉXICO**

**PROJECT TITLE**

National CFC phase-out plan for Mexico, 2<sup>nd</sup> Tranche

**IMPLEMENTING AGENCY**

UNIDO  
SEMARNAT

**NATIONAL COORDINATING AGENCY:**

**LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT**

**A: ARTICLE-7 DATA (ODP tonnes, 2003, AS OF MAY 2004)**

Annex A Group I, CFCs	1,989.00
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**B: COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes, 2003, AS OF MAY 2004)**

ODS	Aerosol	Foam	Ref. mfg.	Ref. Service	Process Agent	TOTAL
CFC-11	0	137	10		0	147
CFC-12	70	55	30	1,634	0	1,789
CFC-113	0				33	33
CFC-114	0			20	0	20
CFC Total	70	192	40	1,654	33	1,989

CFC Consumption remaining eligible for funding (ODP tonnes)	n.a.
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**CURRENT YEAR BUSINESS PLAN:** Total funding US\$5,351,350 Total phase-out, 40 ODP tonnes

PROJECT DATA		2004	2005	2006	2007	2008	2009	2010
<b>CFCs (ODP tonnes)</b>	Montreal Protocol limits	4,625	2,312	2,312	694	694	694	0.0
	Annual consumption limit	4,403	2,205	150	50	50	50	0.0
	Total demand (reference)	1,932	1,667	1,190	725	425	195	140
	Annual phase-out from ongoing projects	40	165	77	15	-	-	-
	Annual phase-out newly addressed	-	100	400	450	300	230	55
	Annual unfunded phase-out	-	-	-	-	-	-	-
<b>TOTAL ODS CONSUMPTION TO BE PHASED OUT</b>		40	265	477	465	300	230	55
Project costs (US\$):								
	Funding for UNIDO	3,517,000	4,478,000	299,500				
	Funding for World Bank		500,000					
	<b>Total project funding</b>	3,517,000	4,978,000	299,500				
Support cost								
	Support cost for UNIDO	263,775	335,850	22,463				
	Support cost for World Bank		37,500					
	<b>Total support costs</b>	263,775	373,350	22,463				
<b>TOTAL COST TO MULTILATERAL FUND (US\$)</b>		3,780,775	5,351,350	321,963				

\* 2004 Consumption data are provisional

Project cost effectiveness (US\$/kg ODP)	5.26 USD/Kg
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**FUNDING**

Approval of funding for 2<sup>nd</sup> tranche (2005) as indicated above.

**REQUEST:**

**Prepared by:**

SEMARNAT / UNIDO

**Date:** 7 February 2005

**Reviewed by:**

n.a.

**Date:** n.a.

## Part 1. ACHIEVEMENT OF THE PREVIOUS ANNUAL PROGRAMME

### 1. Preface

National CFC phase-out plan (NPP) in Mexico was approved in April 2004 at the 42nd Meeting of Executive Committee of the Multilateral Fund for the implementation of the Montreal Protocol. The implementation of the project has started in June 2004. Major achievement for project implementation during June – December 2004 is described in this Chapter.

### 2. Targets

<b>Target achieved, 2004:</b> 3,207.17 ODP tonnes	<b>Target set in Agreement, 2004:</b> 4,403 ODP tonnes
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Indicators		Preceding Year, 2003	Year of Plan, 2004		Reduction (or increase)	
		Actual <sup>(1)</sup>	Actual <sup>(4)</sup> (provisional)	Annual program <sup>(2)</sup>	Actual	Annual program <sup>(2)</sup>
Supply of ODS by	Import	1,168	402.76	400	774.88	768
	Less re-export <sup>(5)</sup>	-	(9.65)	-		-
	Production	821 <sup>(3)</sup>	2,814.05	4,003	(1,993.05)	(3,182)
	<b>Total <sup>(1)</sup></b>	1,989	3,207.17	4,403	(1,218.17)	(2,414)
Demand of ODS	Manufacturing	335	191.61	292	143.4	40 <sup>(6)</sup>
	Servicing	1,654	994.30	1,640	659.7	0
	Stockpiling	n.a.	2,021.26	2,471	(2,021.3)	(2,471)
	<b>Total</b>	1,989.0	3,207.17	4,403	(1,218.2)	(2,431)

<sup>(1)</sup> Actual data reported to the Ozone Secretariat for 2003, however not stipulated in the Agreement.

<sup>(2)</sup> Data provided in the Agreement.

<sup>(3)</sup> Production (8,694.00 ODP tonnes) – Export (7,873.00 tonnes) as per reported to the Ozone Secretariat.

<sup>(4)</sup> Provisional data for 2004 based on audited production data and customs records and quotas (Production, 8,044 ODP tonnes; exports of produced CFC, 5,229.95 ODP tonnes).

<sup>(5)</sup> A part of imported CFC-114 and CFC-115 was exported.

<sup>(6)</sup> From on-going projects.

The data in the above table demonstrate that Mexico fulfilled the year 2004 maximum allowable CFC consumption level requirement of the Agreement calculated in accordance with Article 7 of the Montreal Protocol (consumption=production + import - export).

The CFC production data were audited and verified by independent auditors contracted by UNIDO. The import was slightly lower than planned taking into consideration of re-export of 9.65 ODP tonnes of CFC. Thus, the total supply of new CFCs to the domestic market amounted to only 3,207.17 ODP tonnes, i.e., 1,196 ODP tonnes less than the 4,403 ODP tonnes planned for 2004 under the Agreement. This was the result of the tight control of production, imports and exports under the well functioning licensing system.

### 3. Industry Action

#### 3.1. Data provided in the Annual Implementation Programme.

Sector	Consumption Preceding Year (2003)	Consumption Year of Plan (2004)	Reduction within Year of Plan (2003)-(2004)	Number of Projects Completed	Number of Servicing Related Activities	ODS Phase-Out (in ODP tonnes)
<b>Manufacturing</b>						
Aerosol	70	50.0	20	1	n.a.	20
Foam	192	192	0	0		0
Refrigeration	50	30	20	1		20
Solvents	-	-	-	0		0
Other	20	20	0	0		0
<b>Total</b>	332	292	40	2		40
<b>Servicing</b>						
Refrigeration servicing	1,640	1,640	0	0	1	0
<b>Total</b>	1,640	1,640	0	0	1	0
<b>GRAND TOTAL</b>	1,972	1,932	40	2		40

#### 3.2. Actual data.

Sector	Consumption Preceding Year (2003)	Consumption Year of Plan (2004)*	Reduction within Year of Plan (2003)-(2004)	Number of Projects Completed	Number of Servicing Related Activities	ODS Phase-Out (in ODP tonnes)
<b>Manufacturing</b>						
Aerosol	70	87.41	(17.41)	Partial compl.		(17.41)
Foam	192	104.2	87.8	1		87.8
Refrigeration	40	0	40	1		40
Solvents	-	-	-	-		-
Other	33	0	33	1		33
<b>Total</b>	335	191.61	143.39	3		143.39
<b>Servicing</b>						
Refrigeration	1,654	994.3	659.7	0	1	659.7
<b>Total</b>	1,654	994.3	659.7	0	1	659.7
<b>GRAND TOTAL</b>	1,989	1,185.91	800.66	3 + 1 partial		803.09

\* Preliminary data

According to the data available as of end January 2005, substantial reductions were achieved in the cumulative CFC consumption (manufacturing + servicing sector) in 2004. The actual CFC consumption in 2003 amounted to 1,989 ODP tonnes; the target for 2004 was set in the Annual Plan at 1,932 ODP tones; the actual consumption in 2004 was 1,185.91 ODP tonnes. The achieved reduction of 803.09 has been the result of completion and partial completion of on-

going projects in the foam, refrigeration and aerosol sectors as well as the progress of the legislation, management and awareness components of the Sector Plan, the CFC production closure Plan and the continuing institutional strengthening project.

#### 4. Technical Assistance Activities

##### 4.1. Achievement of activities listed in the annual implementation programme

- a) Proposed Activity: Workshop(s) and investment assistance for CFC user industry in refrigeration manufacturing sector  
 Objective: Achieve final phase-out of CFC use in the refrigeration manufacturing sector  
 Target Group: Enterprises in the above sectors  
 Impact: Phase-out of 50 ODP tonnes of CFC in 2005  
 Achievement: The remnant enterprises were surveyed by a consulting firm to evaluate and verify the use of CFC and the need of assistance for the CFC phase-out in the refrigeration manufacturing sector. The survey shows that no enterprise needs any additional support to convert their production processes.
- b) Proposed Activity: Awareness campaign  
 Objective: Assist phase out of CFC use on national level  
 Target Group: Enterprises and general public in the country  
 Impact: Increased public awareness on importance of ozone layer protection and its practical implications  
 Achievement: Terms of reference was prepared for the contract of a publicity agency to develop video and printed materials for promotion and publicizing the Ozone matter in public media and organizing other related activities. The contract will be signed in 2005.
- c) Proposed Activity: Training of national experts and key stakeholders on the implementation of the NPP  
 Objective: Strengthening of national capacity on project implementation and phase-out program  
 Target Group: NOU-SEMARNAT staff.  
 Impact: Effective implementation of NPP  
 Achievement: With UNIDO assistance, the selected NOU-SEMARNAT staff completed the fundamental training related to the refrigerant management plan in terms of legislation in industrialized countries, new alternatives and on good service practices as well as on the generally available and commonly used service and recovery equipment. After the fundamental training in the UK, the national team made a study-tour to Romania and Croatia to review the experience of implementation of RMPs in these countries. Right after this core personnel training event, NOU-SEMARNAT prepared the detailed plan of implementation of NPP.



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<b>d)</b>	Proposed Activity: Objective:	Training programs for the refrigeration service technicians Improvement of technical skills in detection and recovery of refrigerant gases, including information on good practices in refrigeration servicing and awareness on available alternative refrigerants
	Target Group:	Technicians of the disposal centres of old equipments, training institutions.
	Impact:	Increased CFC containment, strengthening of recovery, and storage and recycling system, reduction of CFC refrigerant consumption in the service sector.
	Achievement:	A national institute was selected as the national training center under the NPP for the training of FIDE (Fund for energy savings) Technicians to recover the refrigerant gases from old equipments. The international bidding for the procurement of the equipment for training center and FIDE technicians was done, and it will be delivered into the training centers in 2005.

#### **4.2 Establishment of national project implementation structure**

Through the execution of activities described in the previous section, the national project implementation structure was established. As stated in the Agreement, the NOU in SEMARNAT is the central coordination institute for the whole project. SEMARNAT assigned experienced staff as dedicated officers for the NPP implementation. Furthermore, SEMARNAT will assign several regional and national institutes for activities, including:

- Survey of refrigeration service sector,
- Development of the strategy for the management of recovered CFCs in Mexico,
- Selection and education of trainers for the training program for the service sector technicians,
- Preparation of national training manual for the service technicians,
- Selection and contracting of the training centre for the service technicians

#### **5. Manufacturing sector program**

The survey applied to the refrigeration manufacturing sector established that there is no more use of CFC in the remaining eligible companies, and the remaining budget will be reallocated for other programs of the plan.

This achievement has been the result of the application of an Emergent Norm, and the market control through the reduction of the CFC supply and the increase of the prices of these substances in Mexico.

#### **6. National project for training of service technicians**

In Mexico, there is a very successful incentive program for retirement of old refrigeration and air conditioning equipments through the Fund for Energy Savings Fund (FIDE). This program has accelerated the replacement of old equipments, resulting in reductions of the use of CFC, since

the new equipment are free of CFC and thus the release of CFCs is continuously reduced in the service sector.

Recovery of refrigerant gases is also included in this program. A national institute was selected as the national training center for the training of FIDE Technicians to recover the refrigerant gases from old appliances.

International bidding for the procurement of the equipment for training center and FIDE technicians was completed, and the equipment will be delivered into the training centers soon.

The Terms of Reference for the training of the service sector technicians as well as the specification of the equipment for the training laboratories and for the service technicians were already prepared. The international bidding will be carried out early 2005.

## **7. Customs training**

The Customs Training program will be initiated soon after the finalization and official publication of the Mexican Official Norm on the specifications of environmental protection measures for the elimination of the use of CFC in equipments and products of national or imported manufacture.

## **8. Other achievements through on-going projects**

With regard to the use of CFC in the manufacturing sector, during 2004 Mexico completed with full success the first tranche of the CFC phase out project in the foam sector. In this project investment part is fully completed and only pending activities are related to awareness raising.

Mexico will implement the second tranche of this project during 2005-2006, to complete the CFC phase out in the foam sector.

Likewise, the remaining aerosol sector companies still using CFCs, signed the respective contracts to phase out the use of these substances within the ongoing phase out program, by the first semester of 2006.

## 9. Government Action

Policy/Activity Planned	Schedule of Implementation	Achievement
<p><u>Ozone Depleting Substances (ODS) Regulations</u></p> <p>The Mexican Government is enhancing its regulation on the uses of CFCs in the Country. The proposed regulation aims for a gradual abandonment of the use of CFCs in all sectors consistent with the Montreal Protocol obligations, through:</p> <p>(i) The enactment of a norm that allows use of CFCs to satisfy only the basic internal needs and essential uses in the Country, and prohibits the production or imports of all kinds of refrigeration equipment, air conditioning equipment, propellant formulations, plastic foam or solvent cleaning operations that use or contain CFCs, except those related to essential uses as defined by the Montreal Protocol.</p> <p>(ii) The implementation of the “Total Annual Quota Program for the National Consumption of CFCs”, which establishes caps for the consumption of CFCs in the Country. The Program will be compulsory for producers and importers of CFCs.</p> <p>This policy is also consistent with the CFC Production Closure Project approved at the 40<sup>th</sup> ExCom Meeting.</p>	<p>During 2005</p>	<p>The Mexican Official Norm is already prepared as a draft and it has to be enacted under the official procedures.</p>

**10. Financial status (as of December 2004)**

Activity	Planned Expenditures (US \$)	Actual Expenditures As of Dec. 2004 (US \$)
a. Project management and technical assistance	350,000	147,000*
b. Refrigeration manufacturing program	300,000	
c. Customs training	338,700	0
d. National project for training of service technicians	1,928,300	269,913**
e. National refrigerant recovery and recycling project	600,000	18,338***
<b>TOTAL</b>	<b>3,517,000</b>	<b>435,251</b>

\* Contract with SEMARNAT, UNIDO mission, local experts, equipment.

\*\* Training equipment and training courses. (Part to be obligated in Feb.)

\*\*\* Core personnel training

**11. Conclusion**

All the milestones set for the first tranche in the national CFC phase-out plan for Mexico were achieved. The current legislation is effectively functioning and supporting the CFC phase-out programme of Mexico. The National Ozone Unit is tightly monitoring the phase-out programme and undertaking the necessary corrective measures if and when required. The ongoing awareness programmes contribute to the reduction of ODS consumption in the Country.

**PART 2. ANNUAL IMPLEMENTATION PROGRAMME ; SECOND TRANCHE****1. Data**

Country	:	Mexico
Year of plan	:	2005
# of years completed	:	1
# of years remaining under the plan	:	6
Target ODS consumption of the preceding year	:	4,403 ODP tones
Target ODS consumption of the year of plan	:	2,205 ODP tones
Level of funding requested	:	US\$ 4,978,000
Lead implementing agency	:	UNIDO

**2. Target**

<b>Target:</b>		2,205 ODP tonnes		
<b>Indicators</b>				
		<b>Preceding Year*</b> <b>2004</b>	<b>Year of Plan,</b> <b>2005</b>	<b>Reduction</b>
Supply of ODS by	Import	402.76	300	206.4
	(Less re-export)	(9.65)	-	-
	Production	2,814.05	1,905	909.9
	<b>Total (1)</b>	3,207.17	2,205	1116.3
Demand of ODS	Manufacturing	191.61	97	95.6
	Servicing	994.30	1,569	(456.1)
	Stockpiling	2,021.26	539	1,476.8
	<b>Total (2)</b>	3,207.17	2,205	1,116.3

\*Provisional data.

## 3. Industry Action

Sector	Consumption Preceding Year (2004) <sup>(1)</sup>	Consumption Year of Plan (2005) <sup>(3)</sup>	Reduction within Year of Plan (2004)-(2005)	Number of Projects Completed	Number of Servicing Related Activities	ODS Phase-Out (ODP tonnes)
<b>Manufacturing</b>						
Aerosol	87.41	30	47.41	0		47.41
Foam	104.2	47	57.2	1		57.2
Refrigeration	0	0	0	0		0
Solvents	-	-	-	-		-
Other	0	20	(20)	-		(20)
<b>Total</b>	191.61	97	94.61	1		94.61
<b>Servicing</b>						
Refrigeration	994.3	1,570	(575.4) <sup>(2)</sup>	0		(575.4)
<b>Total</b>	994.3	1,570	(575.4)	0		(575.4)
<b>GRAND TOTAL</b>	1,185.91	1,667	(481.09) <sup>(2)</sup>	0		(481.09)

<sup>(1)</sup> Preliminary Data

<sup>(2)</sup> An accelerated phase out was achieved in 2004

<sup>(3)</sup> As per Agreement

## 3. Technical Assistance Activity

- a) Proposed Activity: Awareness campaign (continued from the first tranche)  
Objective: Assist the phase-out of CFC use on national level  
Target Group: Enterprises and general public in the country  
Impact: Increased public awareness on importance of ozone layer protection and its practical implication
- b) Proposed Activity: Training programs for the refrigeration service technicians (continued from the first tranche) with following activities: -
- Selection of the training centre for the service sector technicians;
  - Procurement of training equipment;
  - Finalizing and printing training materials and text books.
- Objective: Improvement of technical skills, dissemination of information on good practices in refrigeration servicing, awareness on available alternative refrigerants
- Target Group: Refrigeration service technicians, training institutions
- Impact: Increased CFC containment, strengthening of recovery, recycling and reclamation system, reduction of CFC refrigerant consumption in the service sector
- c) Proposed Activity: Custom Training  
Objective: Improvement on the detection of CFC by the custom officers.  
Target Group: Custom officers  
Impact: Application of the Mexican Official Norm for the control and

- d) Proposed Activity:** ban of the imports of equipments and material containing CFC  
Final tranche of the ongoing incentive program for replacement of Chillers of the World Bank in line with the project document. The details are elaborated in the attached submission of the World Bank (Annex 1).
- Objective:** Improve the recovery of CFC in the chiller sector, incentive programme for the retirement and replacement of old equipments substituting them by new energy efficient and CFC free chillers..
- Target Group:** Owners of chillers
- Impact:** Reduction on the consumption of CFC in the chiller sector.
- e) Proposed Activity:** Incentive program for replacement of old refrigeration and air-conditioning equipments (This program is already developed by the Trust fund for energy savings - FIDE)
- Objective:** Improve the recovery of CFC in the domestic refrigeration and air conditioning sector and the retirement of old equipments substituting by new ones free of ODS.
- Target Group:** Owners of old refrigerant and air conditioning equipments (in use)
- Impact:** Reduction on the consumption of CFC in the domestic refrigeration sector.

#### 4. Recovery and recycling project

Development of a National Strategy for the Management of Refrigerant Gases, that will include a national inventory of equipments that contain CFC, a national inventory of the types and amount of CFCs contained in equipments and the strategy of storage, recycling, and the feasibility of the installation of a destruction technology.

#### 5. Government Action

##### Government action in the second tranche.

Policy/Activity Planned	Schedule of Implementation
Issue of the Mexican Official Norm that allows commercialisation of CFCs to satisfy basic internal needs and essential uses in the Country, and prohibits the production or imports of all kinds of refrigeration equipment, air conditioning equipment, propellant formulations, plastic foam or solvent cleaning operations that use or contain CFCs, except those related to essential uses as defined by the Montreal Protocol.	During 2005

**6. Annual budget**

Table 7 summarizes planned expenditures for the second tranche of the NPP, Mexico.

**Table 7. Project costs of the NPP, second tranche**

<b>Activity</b>	<b>Planned Expenditures (US \$)</b>
a. Project management and technical assistance	300,000
c. Customs training	100,000
d. National project for training of service technicians	1,378,000
e. National refrigerant recovery and recycling project	2,500,000
f. Incentive program for retrofitting and replacement of obsolete CFC containing refrigerators and air-conditioners	200,000
g. Incentive program for retrofitting and replacement of chillers (Co-operating Implementing Agency: World Bank)	500,000
<b>TOTAL</b>	<b>4,978,000</b>

7. Administrative fee, US\$ 373,350



**Annex 1.**

**Action Plan for the exercise of resources equivalent to \$ 500.000 USD for the execution of the Second Stage of the Program of Substitution of Cooling Air Systems (Chillers).**

I. Projects in Process of Formalization

Name of the Enterprise: Comercializadora de Hotelería Oasis, S.A. de C.V. (Palmar I)

Project: Substitution of two inefficient cooling air systems of 175 T.R. y 350 T.R. that actually operate with the R-11 refrigerating gas, for more efficient units which would use the R-134A ecologic refrigerating gas.

Amount of FIDE's investment: US\$104, 348.00

Estimate investment amount of the enterprise: US\$249,489.70

Name of the Enterprise: Comercializadora de Hotelería Oasis, S.A. de C.V. (Oasis Playa HCP)

Project: Substitution of three inefficient cooling air systems of 225 T.R. that actually operate with the R-11 refrigerating gas, for more efficient units, which would use the R-134A ecologic refrigerating gas.

Amount of FIDE's investment: US\$104, 348.00

Estimate investment amount of the enterprise: US\$111, 852.37

C) Name of the Enterprise: Instituto Nacional de Cardiología

Project: Substitution of inefficient cooling air systems of 200 T.R. that actually operate with the R-11 refrigerating gas, for a more efficient unit, which would use the R-134A ecologic refrigerating gas.

Amount of FIDE's investment: US\$104, 348.00

Estimate investment amount of the enterprise: Awaiting to define the total investment amount of the supplier.

D) Name of the Enterprise: Sinaloa Centro, S.A. de C.V. (Plaza Fiesta)

Project: Substitution of two central inefficient cooling air systems of 150 T.R. that actually operate with the R-11 refrigerating gas, for more efficient units which would use the R-134A ecologic refrigerating gas at the Comercializadora de Hotelería Oasis, S.A. de C.V. facilities.

Amount of FIDE's investment: US\$104, 348.00

Estimate investment amount of the enterprise: US\$78,260.87

E) Name of the Enterprise: Industria Química del Istmo, S.A. de C.V. (Grupo Cydsa)

Project: Substitution of central inefficient cooling air systems of 250 T.R. that actually operate with the R-11 refrigerating gas, for a more efficient unit which would use the R-134A ecologic refrigerating gas.

Amount of FIDE's investment: US\$104, 348.00

Estimate investment amount of the enterprise: Awaiting to define the total investment amount of the supplier.

## II. Additional enterprises in process of promotion

According to the information received by the manufacturers, the following enterprises are in process of promotion for the agreement of new projects: Marriot Hotel, Hotel Balboa Tower, Hotel Hayat Acapulco, Hotel Fiesta Americana - Leon Guanajuato, Group Modelo, among others.

On the other hand, FIDE is on charge of the promotion of projects with several enterprises of the country, which at their moment are canalized to the participant manufacturers in the program in order that they present their technical-economic proposals to them, offering the user the necessary elements to be able to go for the best option.

## III. Activities to implement in the projects to execute.

Elaboration of technical-economic evaluation of the projects.

Selection and final quotation from the suppliers of efficient equipment.

Compilation of administrative and financial information for the formalization of the financing and to make the corresponding evaluations.

Authorization process of the projects.

Elaboration and signature of the agreement and contracts.

Payment process of advance payment of 50% to the supplier for the initiation of the projects.

Requisition of the efficient equipment.

Retirement of the inefficient cooling units to proceed with the extraction of the cooling gas R-11 and oil for its recycling.

Physical destruction of the inefficient units.

Rise and signature of corresponding acts.

Supply, starting and putting in operation of the efficient equipment.

Payment process of advance of project by 35%.

Verification of the obtained savings of electrical energy.

Payment process of settlement of project by the last 15%.

Elaboration of the corresponding reports.

## ANNUAL IMPLEMENTATION PROGRAMME

### Sector Plan for Phasing out CFC-11 and CFC-12 Production Sector, Mexico MEX/PRO/40/INV/115

## 1. PROJECT SUMMARY

### 1.1 Project data

<b>Country:</b>	Mexico
<b>Year of plan:</b>	2005
<b># of years completed:</b>	2
<b># of years remaining under the plan:</b>	1
<b>Substances:</b>	Annex A Group I and Annex B Group I
<b>Target ODS production of the preceding year (maximum):</b>	10,400 metric tonnes
<b>Target ODS production of the year of plan (maximum):</b>	5,262 metric tonnes
<b>Target ODS aggregate production for the years 2004 and 2005 (maximum):</b>	13,306 metric tonnes
<b>Level of funding requested:</b>	\$ 4.0 million

**National coordinating agency:** SEMARNAT<sup>1</sup>

**International implementing agency:** UNIDO

### 1.2 Project target

<b>Target:</b>	5,262 METRIC TONNES
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<b>Indicators</b>	<b>Actual in preceding Year (2004)</b>	<b>Year of Plan (2005)</b>	<b>Total in years 2004 and 2005</b>	<b>Total in years 2003 to 2005</b>
<b>Production, metric tonnes</b>	8,044	5,262	13,306	22,000

The CFC production in 2004 according to the findings of the technical and financial audit was **8,044** metric tonnes. As per the Agreement (see Section 2), the aggregate CFC production in

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<sup>1</sup> Secretaria de Medio Ambiente y Recursos Naturales

years 2003 to 2005 shall not exceed 22,000 metric tonnes; therefore aggregate production for the years 2004 and 2005 shall not exceed **13,306** metric tonnes. Further in accordance with the Montreal Protocol, the CFC production in 2005 shall not exceed 50 % of the baseline production of 12,355 metric tonnes, i.e. 6,739 metric tonnes. Accordingly, the 2005 CFC production in Mexico shall be limited to maximum **5,262** metric tonnes.

## 2. BACKGROUND

The Agreement for the Sector Plan for Phasing out CFC-11 and CFC-12 Production Sector, Mexico (first tranche) was approved at the 40<sup>th</sup> Meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol in July 2003<sup>2</sup>.

By approval of the Agreement, Mexico agrees that in exchange for the funding level specified in Table below, it will reduce its total production of the substances of Group I Annex A and Group I Annex B in an accelerated manner as compared to the allowable production indicated in the same Table 1.

**Table 1. Agreement for the Sector Plan for Phasing out CFC-11 and CFC-12 Production Sector**

Year	2003	2004	2005	2006	2007	2008	2009	2010	Total
Maximum allowable production (metric tonnes)	12,355	12,355	6,739	6,739	2,808	2,808	2,808	0	
Maximum production levels agreed (metric tonnes)	22,000*			0	0	0	0	0	22,000
Verified actual CFC production (metric tonnes)	8,694	8,044	-	-	-	-	-	-	16,738
MLF funding US\$ million	5.3	10.7	4.0	11.85	0	0	0	0	31.85
Agency fees US\$	397,500	802,500	300,000	888,750	0	0	0	0	2,388,750

\* Total maximum production for the years 2003 to 2005. It is understood that Mexico may not exceed its allowable production limit during any one year.

Through the implementation of the 2004 Annual Program of the Sector Plan for Phasing out CFC-11 and CFC-12 in the Production Sector (second tranche), Mexico has met its year 2004 Annual Implementation Programme target of containing the maximum CFC production level below **10,400** metric tonnes, since the actual production of CFC-11 and CFC-12 was kept at the level of 8,044 metric tonnes.

<sup>2</sup> Decision 40/54 (h), UNEP/Ozl/Pro/ExCom/40/50 Annex V

In accordance with the Agreement, UNIDO, as the implementing agency, is submitting an Annual Program for the period "1 January - 31 December 2005" for the consideration at the 45<sup>th</sup> Meeting of the Executive Committee. This Annual Program has been prepared in cooperation with SEMARNAT.

This document describes the achievements of the 2004 Annual Program by Mexico and details the planned program and activities for 2005. It is being submitted for approval and release of the third tranche of funds amounting to US\$ 4.0 million including the enterprise compensation and the technical assistance (TA) component for the implementation of the 2005 Annual Programme.

### 3. 2004 ANNUAL PROGRAM ACHIEVEMENTS

#### 3.1 CFC Production phase-out and disbursement

CFC production in 2004 amounted to 8,044 metric tonnes, against the target production of 10,400 metric tonnes set in the 2004 Annual Implementation Programme.

The disbursement to a CFC producer, Quimobasicos, in 2004 amounted to US\$ 10,600,000, allocated for enterprise compensation.

The disbursement to the Government of Mexico in 2003-2004 for the implementation of the TA component was of US\$413,300. This grant is has been allocated for the TA activities to be organized by the Government with the assistance of UNIDO:

<b>Activity</b>	<b>Cost, US\$</b>
Project management, local experts	72,000
Design of an information collection system of ODSs	10,000
Equipment acquisition	17,500
Creation of the system to collect data and information of ODSs	253,300
Training, local and international travels	28,500
Technical and financial audit of Quimobásicos	32,000
<b>Total</b>	<b>413,300</b>

**Table 2. CFC Production phase-out and disbursement in 2003-2004**

Year	Production Phase-out		Grant Tranche (US\$)	
	Target (metric tonnes)	Achieved (metric tonnes)	Allocation (US\$ million)	Status of Obligations
2003	12,355	8,694 *	5,300,000	5,277,735
2004	10,400	8,044 *	10,700,000	10,646,999

\* The independent audit team administrated by UNIDO verified CFC production in 2003 and in 2004.

### 3.2. Policy measures

#### Overview of the past activity

Mexico holds one of the most advanced CFC phase-out programs among Article 5 Countries. Actions started as early as in 1988 and have become a permanent effort of the Government of Mexico. These actions have been coordinated through the Ministry of Environment (currently SEMARNAT). The Mexican CFC policy framework has been focusing on the use and supply of CFCs rather than on actions to control production. Some of the most important measures implemented, include:

- a) **Monitoring on trade of CFCs:** Starting from 1993, the Ministry of Environment has required the national CFC producing enterprises to voluntarily report domestic and international commercial activities such as production, imports and exports volumes. The industry is fully compliant with this requirement.
- b) **Import control on CFCs and CTC:** SEMARNAT has set up an import licensing system on CFCs and CTC, using an inter-ministerial mechanism called CICOPLAFFEST. The Ministry of Finance through the Customs Office enforces this regulation. Under the system, only the holder of import rights (namely Quimobásicos) is allowed to import the raw material (carbon tetrachloride) for the production of CFCs, and only the holders of import rights of CFC (namely Quimobásicos and Dupont) are allowed to import these substances. Allocation of rights is based on historical (1990) domestic sales data. Quotas are established according to the average sales of the years 1995-1997 and subjected to the internal goals of SEMARNAT.
- c) **Constraints for growth on industrial demand of CFCs:** Since 1993, SEMARNAT has played an active role to circumvent the installation of any new CFC consuming facility in the Country, with emphasis on the original equipment manufacturer (OEM) sector. For the installation of any new production facility in the Country Mexican law requires an operation's license, which is granted by SEMARNAT, in order to manage related environmental impact and risks, and to establish emission prevention and control requirements, as well as to define operational conditions and growth. To enable compliance with the Mexican obligations under Montreal Protocol, SEMARNAT has been able to discourage the use of CFCs, and negotiate in favour of CFC substitutes, thus avoiding new progress on CFC consumption in the OEM sector.

Notwithstanding the current degree of success of controlling and diminishing CFC consumption in the Country, the major concerns of the Government regarding further progress of the phase-out process enabling definite compliance with Montreal Protocol obligations are:

- a) Prohibition of import of CFC containing equipment: Since 1998 the Government has been setting up temporary prohibitions on import of refrigeration, air conditioning and water cooling equipment using CFCs in order to halt new additional CFC demand, and complement efforts in controlling manufacturing industry's demand. Permanent control measures will be established by SEMARNAT to prohibit import of equipment using CFC, including also used cars in addition to refrigeration equipment.
- b) Controlling availability of CFCs on the Mexican market: Although collaboration with CFC producers/importers have provided major advancements on control of CFC availability, an agreement on a definite CFC production and import phase-out schedule will be formalized as an integral part of the present project. Nevertheless, the Government of Mexico is concerned about the uncontrolled introduction of CFCs to the Country, and to that end, is preparing actions to strengthen regulations and enforcement to control illegal trade. Support from the international community is being received as part of this project to enhance and speed-up the implementation of such regulations and enforcement.

#### Planned activities

The Government of Mexico established additional supporting measures to promote CFC production phase-out in the Country, while considering domestic remnant necessities and consumption phase-out concerns as discussed in the previous chapter. The main objective of the formulation of the regulatory instruments is the strengthening of a policy framework to achieve complete ODS phase-out complying with the obligations under the Montreal Protocol in a gradual and orderly manner to minimize adverse economic affects to all sectors involved.

- a) Ozone Depleting Substances (ODS) Regulations: The Mexican Government has initiated formulation of a detailed regulation to monitor and control the production and uses of Ozone Depleting Substances in the Country. Proposed regulations include control mechanisms for several Ozone depleting substances, such as CFCs, carbon tetrachloride, halons, methyl chloroform, and methyl bromide. Salient features of the proposed regulation regarding CFCs are:
  - (i) Gradual abandonment of the use of substances that deplete the Ozone layer in all sectors consistent with the Montreal Protocol obligations. The rule would be compulsory for all producers, importers, exporters, distributors, vendors and commercial and industrial consumers of CFCs.
  - (ii) From the date of implementation of the norm, authorized commercialization of CFCs will be only permitted to satisfy basic internal needs and essential uses in the Country. The regulation will include schedules with maximum allowable quantities permitted for such uses on a yearly basis until 2010.

- (iii) From the date of implementation of the regulation, it will be prohibited to produce or import all kinds of refrigeration equipment, air conditioning equipment, propellant formulations, plastic foam or solvent cleaning operations that use or contain CFCs, except those related to essential uses as defined by the Montreal Protocol.
- (iv) The regulation will establish rules to control the commercialisation of recycled or reprocessed CFCs.

#### Achievement in 2004

A series of policy measures were adopted and implemented during the course of the year 2003 as summarized below.

a) Production Quota: The Government of México established a CFC production quota to the CFC producing enterprise, Quimobásicos. The production quota system is in place from January 2004.

The monitoring and enforcement mechanism for the production plan involve:

- (i) Quota system operation is established as a production cap issued to the Production Sector by SEMARNAT (production quota);
- (ii) Mandatory reporting of Production Sector on actual production figures to the National Ozone Unit;
- (iii) Monitoring and supervision of implementation of CFC production cap, and on import of raw material (carbon tetrachloride);
- (iv) Sanctioning of the production sector in case of exceeding its and/or import quota; in such cases the quota is correspondingly reduced for the following year taking into consideration also the production Sector phase-out Agreement with the ExCom (ANNEX IV).

b) Regulation for control of ban of production and import of CFCs: The Government of México is promoting an agreement between the CFC importers to close the importation, and only use in the next years the stockpiles produced during the period of 2003-2005.



**Table 3. Policy measures achievement in 2004**

<b>Legislation</b>	<b>Related Activity</b>	<b>Planned Timing in project proposal</b>	<b>Achievement in 2004</b>
Production Quota	Introduction of production quota	2003 - 2004	Production Quota was put in place. CFC Production has been controlled by import regulation of CTC.
Regulation for control and ban of production and import of CFCs	Enactment	By 2005	Draft regulation prepared

### 3.4 Technical assistance activities

#### Implementation modality

Following steps have been taken in order to execute the technical assistance activities.

- Project approval: July 2003
- Allocation of the grant for the compensation for the enterprise and the technical assistance activities determined: September 2003
- Detailed technical assistance activities determined: October 2003
- Budget allocation for each activities determined: October 2003
- Mechanism for the grant transfer determined: December 2003
- Recruitment of a national expert initiated: December 2003

Planned key activities and achievement in 2004

Table 4 summarizes achievements and the status of key activities in 2004.

**Table 4. Achievements and the status of key TA activities in 2004**

Activity item	Planned timing as per Project Document	Achievement and status in 2004
a) Design of public awareness campaign to promote phase-out of CFCs	2003 - 2004	Design of and awareness strategy was designed and approved by the social communication office of SEMARNAT. TOR for design of video and printed material is in preparation. The organization of an event to announce the CFC closure production in Mexico is in preparation.
b) Design and conduct market study to fully characterize remnant demand of CFCs in Mexico	2003 -2004	Contract of the national expert that will develop the National Strategy for CFC Management in México was issued. Implementation is continuous in 2004 and years after based on the grant to be provided in later tranches.
c) Prepare consumer sector phase-out plan to submit to MLF for approval of funds necessary for phase-out.	2003 - 2004	Refrigeration sector CFC phase-out plan (NPP) submitted to the 42 <sup>nd</sup> ExCom was approved.
d) Customs training programme to control illegal trade in harmony with NPP	2003 - 2004	The relevant project was included in the NPP submitted to the 42 <sup>nd</sup> ExCom for assistance from the Multilateral Fund. The training program has been deferred until the Mexican Official Norm is issued, this will occur during 2005.

Activity item	Planned timing as per Project Document	Achievement and status in 2004
e) Creation of information and monitoring system on the production, consumptions imports, exports of CFCs and other ODS including a remote communication system via internet.	2003 - 2004	The information and monitoring system is being designed by an information technology company under a contract already awarded; they will develop the software, procure the equipment, install the system and conduct a training campaign to all users of this system (Customs, Health Ministry and SEMARNAT).
f) Regular training programmes for the Government and Industry on regulations and enforcement regarding CFC phase-out matters.	2003 - 2004	Organization of Workshops for Government officials in Health, Agriculture, Economy and Environmental Ministries. Execution planned in 2005 using the third tranche of the grant.

### 3.5. Monitoring and reporting activities

The monitoring and reporting mechanism undertaken in 2004 is detailed in Table 5.

**Table 5. Monitoring and reporting activities in 2004**

Activity	By	Timing	Remarks
2nd Tranche approval	April 2004	April 2004	42nd ExCom
Contract with the enterprise for compliance, reporting as well as other obligation	UNIDO Enterprise	April 2004	UNIDO Contract No. 04/105
Progress report to UNIDO based on the contract above	Enterprise	May 2004	Satisfactory report received
Audit for verification of CFC production phase-out	Auditor	January 2004	Satisfactory report received. It was submitted to MFS for consideration for approval at the 42nd ExCom
Supervision	UNIDO SEMARNAT	January 2004	Supervision was undertaken in January 2004

## 4. 2005 ANNUAL PROGRAM: OBJECTIVES AND ACTIVITIES

### 4.1 ODS Phase-out objectives and disbursement allocation

The objective of the 2005 Annual Program is to ensure that the CFC production does not exceed **5,263** metric tonnes in the year, and the total accumulated production in years 2003 to 2005 does not exceed 22,000 MT.

UNIDO, on behalf of the Government of Mexico, is requesting the release of the third installment of US\$ 4.0 million to achieve this objective, which is to be disbursed to the following categories:

- US\$ 3.81 million, which will be disbursed to the beneficiary CFC producing enterprise for reducing keeping the production level in accordance with the annual production allowed for 2005; and
- US\$ 0.19 million for implementation of the TA component.

### 4.2 CFC production phase-out target

The Government of México will authorize a CFC production quota to Quimobásicos, the only CFC producer in México. The production level authorized is no more than **5,263** MT for 2005.

Further, the Government of Mexico authorizes the import Quota of CTC to the CFC producing enterprise up to 9,300 metric tonnes in 2005. Therefore, the enterprise can produce up to **5,263** tonnes of CFC-12 and CFC-11.

**Table 6. CFC Production target at the production enterprise**

Name of company	MAXIMUM 2005 ANNUAL PRODUCTION, (metric tonnes)
Quimobasicos	5,262*
Total	5,262*

\* With the condition that the maximum aggregate CFC production in 2003-2005 is 22,000 metric tonnes.

### 4.3 Policy measures

A series of policy measures is going to be implemented during the course of the year 2004 as summarized below.

**Production Quota:** The production quota system is in place from January 2004. The import Quota system of the ODS raw material, CTC is being continued to doubly control the CFC production in the production sector.

Regulation for control and ban of production and import of CFCs: The Government of México continues promoting an agreement between the CFC importers to close the importation, and only use for the next years the stockpile produced during the period prior to the cessation of CFC production at Quimobásicos.

**Table 7. Policy measures to be carried out in 2004**

<b>Legislation</b>	<b>Related Activity</b>	<b>Planned timing in project proposal</b>	<b>Plan in 2004</b>
Production Quota	Introduction of production quota system	2003 - 2004	Production Quota system will be used to continue to control CFC production through imposition of import Quota on CTC
Regulation for control and ban of production and import of CFCs	Enactment	In 2005	Proceeding for the approval by the Parliament

#### **4.4 Technical assistance activities**

Proposed technical assistance activities to be undertaken during 2005 are summarized below. These activities have been decided based on the priorities of the Government of Mexico with regard to the national ODS phase out strategy.

##### **a) ODS Information monitoring system.**

This system will consist of an instrument to monitor permanently the flows and related information of ODS that are imported and exported through all the Mexican customs. It will register the gross sales and use of ODS inside the country and will be capable to follow up the movements in the quota established for the importers of ODS.

The major activities of this item are:

- design and implementation of the ODS information and monitoring system.
- supervision of the implementation of the information system.
- acquisition of a remote communication system via internet to facilitate training activities and linkage with stakeholders involved.

**b) Technical assistance and training of relevant ministries and agencies.**

It consists of technical workshops for officials of governmental agencies related to ODS management (Environmental Federal Attorney, Customs, etc.) with the aim to train them in ozone layer protection issues and specifically in detection and identification of ODS.

In the courses the participation of national and international experts is envisaged. It will utilize the specific material developed by UNEP. For the environmental attorney officials, it will include the supply of infrared identifiers of ODS.

Major activities are:

- recruitment of national and international experts;
- acquisition of existing training materials;
- acquisition of infrared identifiers;
- organization of training courses and workshops

**c) Technical audit, supervision**

It is planned to carry out technical audits at Quimobásicos at the end of each year during the period of 2003-2006, to authenticate compliance with the agreement with the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol. Through this instrument SEMARNAT verify the quantity of CFC produced in Mexico each year and take the necessary measures to ensure compliance with the Montreal Protocol.

**d) Development and implementation of a communication strategy**

This item will allow the Government of Mexico and SEMARNAT through the National Ozone Unit to communicate to specific publics the advances of México in the process of implementation of the Montreal Protocol and in particular, the closure of CFC production in México. This program is implemented in close coordination with the Social Communication Office of SEMARNAT.

The major activities are:

- Design and development of a communication strategy;
- Design of materials;
- Special events.

**e) Local and international travels**

This item is related to the local travels of the national experts, governmental officials and national ozone unit personnel for the different activities related to this technical assistance program.

**f) General project management**

Assist the ozone Protection Unit in coordinating and managing the technical assistance project for the CFC Production Sector Phase-out Plan, specifically in the preparation of reports, design, development and implementation of the different programs included in this project, development and management of databases for ODS and support the technical audits of CFC production closure.

Major activities:

- Recruitment of national experts
- Following up on the Monitoring system, the National Strategy for CFC Management and other related programs.

**g) Time schedule**

The tentative time schedule is given as in the table below.

**Table 8. The tentative time schedule for TA activities in 2005-2006**

	Activity	2005												2006
		J	F	M	A	M	J	J	A	S	O	N	D	
<b>A</b>	<b>ODS Information and Monitoring System</b>													
	Signing of contract.													
	Design and operation of the ODS Information and Monitoring System													
	Send to UNIDO for revision and initiate the process of acquisition of Remote communication system via internet to facilitate training activities and linkage with stakeholders involved.													
	Acquisition of Remote communication system.													
<b>B</b>	<b>Technical assistance and training of relevant ministries and agencies</b>													
	Design of workshops													
	Preparation of workshop													
	Training workshop													

	Activity	2005												2006
		J	F	M	A	M	J	J	A	S	O	N	D	
<b>C</b>	<b>Technical Audit supervision</b>													
	Audit to a CFC production factory													
<b>D</b>	<b>Development and implementation of a Communication strategy</b>													
	Design of the communication strategy													
	Implementation of the communication strategy													
<b>E</b>	<b>Local and international travels</b>													
<b>F</b>	<b>General project management</b>													
	Recruitment of a national experts													
	<b>Report</b>													

**g) Estimated costs of activities**

The estimated cost of the project by activity is listed in the table below.

**Table 9. Estimated costs of TA activities**

	<u>Activity</u>	<u>2003-2004</u> <u>US\$</u>	<u>2005</u> <u>US\$</u>	<u>2006</u> <u>US\$</u>
<b>A</b>	<b>ODS Information and Monitoring System</b>			
	Elaboration of Terms of Reference of the project for ODS Information and Monitoring System	3,500		
	Design and implementation of the ODS Information and Monitoring System	227,000	40,000	80,600
	Acquisition of Remote communication system via internet to facilitate training activities and linkage with stakeholders involved.	30,000		
<b>B</b>	<b>Technical assistance and training of relevant ministries and agencies</b>			
	Training workshop	37,300	10,000	10,000



	<b>Activity</b>	<b>2003-2004 US\$</b>	<b>2005 US\$</b>	<b>2006 US\$</b>
<b>C</b>	<b>Technical Audit supervision</b>			
	audit to a CFC production factory	16,000	16,000	16,000
<b>D</b>	<b>Development and implementation of a Communication strategy</b>			
	Implementation of the communication strategy	37,500	89,000	105,100
<b>E</b>	<b>Local travels</b>	12,000	5,000	5,000
<b>F</b>	<b>General project management</b>			
	Recruitment of a national experts	50,000	30,000	30,000
	<b>TOTAL</b>	413,300	190,000	246,700

#### 4.5. Monitoring and reporting activities

The similar steps will be taken for the monitoring and reporting schedule for 2005 as undertaken in 2004. Table below summarizes the relevant activities.

**Table 10. Monitoring and reporting activities in 2005**

<b>Activity</b>	<b>Responsible</b>	<b>Timing</b>	<b>Remarks</b>
Approval of Annual Tranche programme 2005	-	April 2005	45th ExCom
Contract with the enterprise for compliance, reporting as well as other obligation	UNIDO Enterprise	May 2005	Modality for preparation of the contract and the contractual obligation to be decided by UNIDO after the approval of the 2004 annual programme
Progress report to UNIDO based on the contract above	Enterprise	To be decided in the Contract	-
Audit for verification of CFC production phase-out	Auditor	January 2006	-
Supervision and regular monitoring	UNIDO SEMARNAT	During 2005	Periodically



**MEXICO**

**CFC PRODUCTION  
SECTOR AUDIT  
REPORT**

**(FOR 2004)**

**ESS JAY CONSULTANTS:**

Mr. T. K. Padmanabhan, Team Leader  
Mr. V. K. Trehan, Engineer, Technical Expert  
Mr. Hitesh, Mahajan, Chartered Accountant,  
Financial Expert

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Mr. A. Sanchez-Guevara, Ozone Protection Unit  
Coordinator

**UNIDO:**

Dr. T. Gróf, Unit Chief, Project Manager  
Mr. Rodrigo Serpa, Consultant

**DATE OF SUBMISSION: 27.01.2005**

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**Technical and Financial Audit of the CFC plant Cydsa / Quimobasicos Monterrey, Mexico for the MEX/PRO/40/INV/115, “Sector Plan for Phasing out of CFC-11 and CFC-12 in the Production Sector” (third tranche)”**

**BACKGROUND**

1. The Executive Committee entered into an Agreement with Mexico, by which the only plant producing CFCs in Mexico will be assisted with funds to meet international obligations under the Montreal Protocol.
2. The Agreement (UNEP/OzL.Pro/ExCom/40/50) stipulates the CFCs production that is permissible to Mexico for specified years and the funding that will be made available for compliance.
3. The cited Agreement uses the following terms to describe the CFC production permitted for the plant.
  - a. **“Maximum Allowable Production”** 2003 to 2010. Year wise production limit in accordance with the Montreal Protocol.
  - b. **“Maximum Production Levels Agreed”** 2003 to 2005. This stipulates the maximum production (22,000 MT) permitted under the cited Agreement for the Mexican Production Sector. The Plant will cease CFC production thereafter.
4. The Agreement stipulates a “Maximum Allowable Production” of 12,355 MT in 2004, which is a part of the “Maximum Production Levels Agreed” limit of 22,000 MT in the years 2003-2005.

The plant produced 8,694 MT of CFCs in 2003 against the “Maximum Production Levels Agreed” of 22,000 tonnes for the years 2003, 2004 & 2005. Hence, the permitted total production for CFCs in 2004 and 2005 is 13,306 MT. Of this total, the plant is allowed to produce a maximum of 12,355 MT in 2004.

## **EXECUTIVE SUMMARY**

## **EXECUTIVE SUMMARY**

### **1. Objective of the audit**

Verification of CFC-11 and CFC-12 production in 2004 at Quimobasicos Factory, Monterrey, Mexico with a verification team to study the financial and technical data on the site to establish that the production of this enterprise is in accordance with the Agreement, UNEP/Ozl.Pro/ExCom/40/50 .

The disbursement of funds under this Agreement to the beneficiary enterprise is contingent on independent verification and report of CFC production.

### **2. Verification Team**

The audit was carried out by Ess Jay Consultants who were accompanied by persons from the Government of Mexico and UNIDO to ensure the right process under Ex Com Guidelines was followed.

### **3. Two plants producing ODS**

The Quimobasicos Plant at Monterrey has two refrigerant production units of Allied Signal Technology. Both plants have a common control room with sophisticated PLC based integrated control systems. Plant 1 (commissioned in 1963) produces only HCFC- 22, and Plant 2 (commissioned in 1983) produces CFC-11 and CFC-12. Both plants have a swing-over capability but are running in the modes indicated, since 1995. The average swing-over time from CFC-11/CFC-12 to HCFC-22 or vice versa is 15 days and the plant deems the swing over time as uneconomical and has decided to dedicate product manufacture in Plants 1 & 2 as indicated above.

Thus, only the plant producing CFCs (Plant 2–commissioned in 1995) was audited in detail & audit of Plant-1(producing HCFC) was carried out only to confirm that it produced only HCFC 22.

#### **4. Summary outcome of Audit**

a. The field verification on 2004 CFCs production at Quimobasicos' factory confirms the production, inventory and sales data submitted by the Plant in response to the questionnaire sent to them prior to the audit. The plant produces CFC-11, CFC-12 and HCFC-22.

b. The actual production of CFC-11 and CFC-12 is well within the "Maximum Allowable Production", (i.e., the CFC Production Freeze Target for Mexico under the Montreal Protocol) of 12,355 MT for the year 2004.

c. The Enterprise Quimobasicos has produced only 8,044 MT of CFC-11 and CFC-12 against the 2004 "Maximum Allowable Production" limit of 12,355 MT. This represents utilisation of 65.10 % of the production limit for the year 2004.

d. The plant has also committed to a total production of 22,000 MT in the period 2003-2005 under the Agreement. Against this commitment, the production was 8,694 MT in 2003 and 8,044 MT in 2004, i.e. a total of 16,738 MT, which is 76.08% of their 3 year "Maximum Production Levels Agreed" limit. Thus, Quimobásicos, as the only CFC producer in Mexico, has a provision to produce 5,262 MT of CFCs in the year 2005. The management is contemplating to complete this production limit by May 2005 and cease CFC production thereafter.

e. The CFC-11 & CFC-12 closing stock verified at the end of December 2004 is 2,435 MT, which will be the opening stock for 2005. The plant, in addition to its own storage capacity for finished goods, has used bulk storage on contractual basis outside the Plant.



**5. CFC-11 and CFC-12 production audit summary  
(January 2004 – December 2004), MT**

<u>Item</u>	<u>Data</u>	<u>Remarks</u>
Maximum Production Level Agreed for 2004 (MT)	12,355	(Production freeze target for Mexico)
Actual Production 2004 (MT)	8,044	(Gross production)
Difference +/- (MT)	4,311	(Under produced)
Actual Production in 2003 (MT)	8,694	
Total Production in 2003-2004 (MT)	16,738	
Max. Allowable Production 2003-2005 (MT) under the Agreement (MT)	22,000	(In accordance with the Agreement)
Max production level under Agreement 2005 (MT)	5,262	
% of 2004 “Maximum Production Level Agreed” utilized (%)	65.10	
% of 2003-2005 Max Allowable Production under the Agreement utilized (%)	76.08	
Opening Stock as of 1 <sup>st</sup> January 2004 (MT)	443	
Other additions	0	
Total opening stock as of 1 <sup>st</sup> January 2004 (MT)	443	
Gross production (MT)	8,044	
Filling & other losses (-)/ Surplus(+)*(MT)	-23	Filling loses are accounted as a part of gross production and adjusted against Max. Production Level Agreed
Net production (MT)	8,021	Gross Production minus Losses
Domestic Sales (MT)	1,049	
Export sales (MT)	4,980	
Total sales (MT)	6,029	
Closing stock Dec 2004 (MT)	2,435	Opening stock plus net production minus sales.

**6. Any unusual occurrences, which have an effect on the CFC production in 2004**

In the month of April 2004, production in the CFC plant was NIL as the plant was stopped for attending to a rupture in the reactor. During this period, the catalyst was also changed.

It was reported that there was no incident or occurrence leading to major loss of raw material/ finished product, as a result of this plant stoppage. The auditors verified this by examining records before, during and immediately after the shutdown period.

**7. Any CFCs other than CFC-11 or CFC-12 produced or purchased by the plant**

Only CFC-11 and CFC-12 is produced by the plant. However, there is import of other CFCs e.g. CFC-113, CFC-114, CFC-115, CFC- 124 etc to cater to domestic demand.

**8. Major modifications and equipment change in Plant 2:**

No major modification or equipment change was carried out in this plant in the year 2004. As per un-audited balance sheet as on December 2004 no major equipments were purchased by the company, which increase the CFC production capacity.

**9. Future Plans for the production of CFC and alternative use of Plant 2**

The management of the Plant informs that they plan to produce the balance under the CFC “Maximum Production Levels Agreed” for the year 2005 by May 2005 (i.e. a maximum of 5,263 MT) and thereafter cease CFC production for consumption as ODS. They propose to use the plant for HCFC 22 production.

## EXECUTIVE COMMITTEE FORMATS & COMMENTS

The Formats as given in Doc No 32/33 Dated 24 October 2000 were filled and submitted by the plant prior to the physical verification and were verified at the time of location audit.

Major observations:

(Ex-Com Forms 1, 2, 3 and 4 annexed)

- a. Data on plant location, names of respondents etc. were given by the plant
- b. The combined capacity of both the plants, in CFC terms is 23,652 MTA. Both plants have equal capacity in CFC terms.
- c. Data submitted for CFC-11 and CFC-12 from 1995 onwards are for Plant 2 as there has been no swing over in the two plants.
- d. HF in-house production was discontinued from Dec. 2001.
- e. CTC was always imported after getting the import permission/license from the Government of Mexico.
- f. The enterprise has reduced production in 2004 by around 7.50% over the year 2003. (2004 production: 8,044 MT; 2003 production: 8,694 MT). The decrease in production in 2004 was due to reduction in the number of operating days. However, the plant has been operated at 30.69 TPD in 2004 against the nominal rate of production of 36 TPD (11,826 TPA/330 days). The average production per day for the year 2004 is higher than the average production per day for the year 2003 (28 TPD).
- g. Net Loss is 23 MT, which is 0.29% of Gross production. This loss is comparable to the best plants in the world. The loss is taken as a part of gross production.
- h. CTC and HF norms are consistent over the years and comparable with good plants in the world. Only in the month of January 2004, the norms are higher than the rest of the year due to the low number of operating days (4.5 days).
- i. The ratio of production of CFC-11 and CFC-12 in the years 2003 and 2004 has remained the same.

Year	CFC-11 (MT)	CFC-12 (MT)	Ratio (CFC-12 / CFC-11)
2003	1,291	7,401	5.73
2004	1,177	6,867	5.83

- j. The total consumption of CTC in the year 2004 as verified was 10,482.34 MT.
- k. The verification audit of 2004 production at Quimobasicos plant according to the Agreement between Mexico and the Executive Committee for the phase-out of CFCs in the production sector was carried out. Both plants are in good condition and well maintained. Based on the data supplied by the enterprise and random checks, the verification team from Ess Jay Consultants confirm the monthly and annual production, sales and inventory data as given in Ex-Com formats attached as Forms 1, 2, 3 & 4.
- l. In 2004 the production was accounted in both gross and net basis and the losses were calculated as the difference between the two.
- m. Data of Plant 1 producing HCFC-22 is included in Sheet ExCom F4. The HF consumption balance was verified for both plants as they have a common storage of the raw material.
- n. The total consumption of HF in the year 2004 (CFC & HCFC both) as verified was 7,086.40 MT. Verification of consumption of the 2 plants is given in the detailed portion of the report.

Raw Material Consumption ratio	<u>CFC-11</u>	<u>CFC-12</u>
Carbon tetrachloride (tones/ ton of product)	1.1676	1.3265
Hydrogen fluoride (tones/ton of product)	0.1665	0.3780

CTC and HF norms are consistent over the years and comparable to good plants in the world.

**Ex-Com Form 1**

**Questionnaire for ODS production Phase Out Verification (Including Gradual Closure)**

**A. Plant identification**

Name of enterprise : Quimobásicos, S.A. de C.V.  
Plant reference number : N.A  
Sector plan number : MEX/PRO/40/INV/115  
SRI # : N. A  
Address of the plant : Ave. Ruiz Cortínes # 2333 Pte, Monterrey, N.L. México  
Contact person(s) and functional title : Sergio Lozano García, General Manager  
Ing.Walter Hugler Quintanilla, Manager Planning  
Telephone number : (52) 8158-2695  
Fax number : (52) 8351-3582  
E-mail address : selozano@cydsa.com

**B. Verification Team Composition**

Ess Jay Consultants : Vibhash Kumar Trehan, engineer, technical expert  
Hitesh Mahajan, chartered accountant, financial expert  
Accompanied by :  
SEMARNAT : Agustin Sanchez -Guevara, Ozone Protection Unit  
Coordinator  
UNIDO Multilateral Environmental : Dr. Tamas Grof, Unit Chief, project manager  
Agreement Branch : Mr. Rodrigo Serpa Fonnegra, consultant  
Date of plant visit : 11<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup> January 2005  
Duration of visit : Three and half days

**Ex-Com Form 2****2. Questionnaire for ODS production Phase Out Verification (Including Gradual Closure)**

## A. Plant history

**Date of construction: Plant 1 = 1963, Plant 2 = 1983**

ODS Products	No of lines	Capacity in baseline year (for both plants)	Production										
			Baseline year (aver. 95-97)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CFC-11	2 <sup>(1)</sup>	<b>23,652</b>	2,586	2,411	3,051	2,297	1,020	1,225	1,307	851	757	1,291	1,177
CFC-12	2 <sup>(1)</sup>		7,714	9,473	7,156	6,513	4,658	4,305	6,238	5,790	4,894	7,402	6,867
CFC-13													
CFC-113													
CFC-114/115													
Raw material production													
HF <sup>(2)</sup>	1 <sup>(3)</sup>		5,774	5,021	6,203	6,098	4,344	5,210	4,956	4,166	-	-	-
CTC													

(1) Site contains 2 swing plants. Actual capacity of each is 11,826 Tons/year of CFC-11/12 (minimum relation 12/11 = 9/1)

(2) Include HF production for both CFC 11/12 and HCFC-22.

(3) Production of HF at the site was discontinued from December 2001.

<b>3. Questionnaire for ODS production Phase Out Verification (Including Gradual Closure)</b>												
Annual CFC-11/12 quotas, production, sales and stocks since the baseline year												
<b>CFC-11</b>	<b>Baseline year (aver. 95-97)</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000<sup>(2)</sup></b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Quota <sup>(1)</sup>	11,232	None	None	None	None	None	None	None	None	TOTAL CFCS: 22,000 MT		
Opening stock at beginning of year		143	164	142	78	157	212	175	175	322	82	
Production	2,586	2,411	3,051	2,297	1,020	1,225	1,307	851	757	1,291	1,177	
Purchases					167							
Sales	2,604	2,397	3,068	2,349	1,100	1,173	1,342	838	603	1,534	662	
Loss (Surplus)		(7)	5	13	7	(3)	3	(13)	(7)	3	(4)	
Closing stock at end of year		164	142	78	157	212	175	175	322	82	593	
<b>CFC-12</b>	<b>Baseline year (aver. 95-97)</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000<sup>(2)</sup></b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Quota <sup>(1)</sup>	11,232	None	None	None	None	None	None	None	None	TOTAL CFCS: 22,000 MT		
Opening stock at beginning of year		751	236	398	212	1,095	273	405	316	271	361	
Production	7,714	9,473	7,156	6,513	4,659	4,305	6,238	5,790	4,894	7,402	6,867	
Purchases					668							
Sales	7,880	9,983	6,994	6,663	4,426	5,134	6,105	5,860	4,918	7,310	5,367	
Loss (Surplus)		5	(0)	36	18	(7)	1	(19)	(21)	(2)	(19)	
Closing stock at end of year		236	398	212	1,095	273	405	316	271	361	1,842	
<sup>(1)</sup> Total CFC production baseline												
<sup>(2)</sup> Quota includes 10% additional allowance for basic needs of Art V Countries												

**Ex-Com Form 3 (contd.)**

Annual HF/CFC ad CTC/CFC ratios											
Ratio	Baseline year (aver. 95-97)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>CFC-11</b>											
HF/CFC-11 ratio	0.1622	0.1603	0.1626	0.1638	0.1636	0.1654	0.1665	0.1643	0.1661	0.1661	0.1665
CTC/CFC-11 ratio	1.1850	1.1816	1.1821	1.1912	1.1971	1.1999	1.1999	1.1742	1.1694	1.1539	1.1676
<b>CFC-12</b>											
HF/CFC-12 ratio	0.3686	0.3643	0.3693	0.3721	0.3686	0.3689	0.3687	0.3725	0.3757	0.3772	0.3780
CTC/CFC-12 ratio	1.3367	1.3554	1.3009	1.3539	1.3576	1.3523	1.3285	1.3324	1.3242	1.3116	1.3265

Operational days per year											
Type of production	Baseline year (aver. 95-97)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CFC-11		310	303	296	219	226	232	265	217	312	262
CFC-12		310	303	296	219	226	232	265	217	312	262



# **DETAILED REPORT ON THE AUDIT**

## **DETAILED REPORT ON THE AUDIT**

### **1. Audit team, dates of location audit, broad verification steps**

The audit was undertaken in line with the Guidelines of Executive Committee for verification of ODS production phase out (UNEP/Ozl.Pro/ExCom/32/33, dated 24th October 2000).

#### a. Location audit team

Mr. V. K. Trehan, Ess Jay Consultants

Mr. Hitesh Mahajan, Ess Jay Consultants

The following persons from the Government of Mexico and UNIDO accompanied the audit team to ensure that the right process was conducted in terms of ExCom Guidelines for verification of CFC production phase-out and the Agreement:

Mr. A. Sanchez-Guevara, Ozone Protection Unit Coordinator, SEMARNAT

Dr. T. Gróf, Unit Chief, Multilateral Environmental Agreement Branch, UNIDO

Mr. Rodrigo Serpa Fonnegra, Multilateral Environmental Agreement Branch, UNIDO

UNIDO prepared a Terms of Reference for the verification mission. The Auditor was selected in an open international bidding process performed according to UNIDO's financial rules and based on the Terms of Reference. Prior to the field visit UNIDO made available to the selected Auditor the Production Sector Closure Agreement, the Guidance Document UNEP/Ozl.Pro/ExCom/32/33, dated 24th October 2000, the results and data of the previous audit, the baseline information and annual data reported by the enterprise.

Cydsa / Quimobásicos made duly completed the Questionnaire prepared by UNIDO and Ess Jay Consultants in line with UNEP/Ozl.Pro/ExCom/32/33, dated 24th October 2000 and returned it to the auditor prior to the site inspection.

During the site visit, the enterprise made available to the team of auditors (one technical expert and one chartered accountant) the required managers and experts who answered all queries in an open and professional way. Access was provided to all premises of the Plant and to all documents, daily production logs, sales and financial records requested by the auditors for the purpose of the audit and validation of the data provided by the Plant in the Questionnaire.

b. Dates of Audit:

The Audit was undertaken on 11<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup> of January 2005 (three and a half days on site).

c. Broad methodology adopted for audit:

Plant round was taken for precise understanding of operations and record keeping. The system of measurement for raw material receipt, issues, production, sales and closing stock was reviewed. The following operational and statutory records were examined:

- Raw material purchase and issue records
- Daily Production logs and production records
- Process parameters records
- Quality control records
- Stock transfer and record for storage of stocks at strategic location (storage on contractual basis outside the Plant), consignment storages, storages at all points of sales (Monterrey and Mexico City).
- Stock register in value as per books of accounts for the year 2003 to check the opening stock and also Audited Balance Sheet for the year 2003 for cross checking.
- Sales Invoices
- Monthly VAT returns filed with revenue authority for claim of IVA, which gives the monthly purchase of raw materials and sales of finished goods.
- Import quotas issued for CTC and HF and actual import entered into Mexico based on the records of Customs.

The verification of the data provided by the enterprise is annexed as a part of this report.

- Random dates (in March, May, August & December) were selected in CFC and HCFC plants for studying in- process parameters, laboratory and analytical records.
- Volume and value of opening and closing stock was verified.
- Verified purchase invoices (all invoices for CTC and HF in the year 2004), on randomly selected dates, incoming and issues from plant stores were checked.

- On randomly selected dates (in March, May, August & December) Hourly production records were integrated to arrive at daily production.
- From the filled stocks samples from CFC and HCFC were taken for vapour pressure, weight and gas chromatography analysis.

## **2. Verification of Plant records and process adopted**

### a. Overview

A brief presentation was made by the enterprise about the systems of operations and maintenance. Plant visit was taken for precise understanding of operations and record keeping in various Departments.

Each department is maintaining material accounting records, and the final consumption of raw materials is arrived through purchase, opening and closing stock at the enterprise level. The overall method of record keeping is found satisfactory. Entries in books of account are matching with the plant records which was ascertained through random verification.

The enterprise has two plants located in the same premise. One plant (Plant 1) was commissioned in 1963 and the other (Plant 2) was commissioned in 1983. Each plant has the capacity to produce 11,826 Tonnes / year of CFC11/12. Both plants have a common control room with sophisticated PLC based control system. The hazardous material handled in the plant's equipment and pipelines are located in a closed chamber connected to a central absorption system to handle any emergency safely. Though each plant can be operated in both the modes of CFC-11/CFC-12 or HCFC-22, from 1995 the old plant operates solely on HCFC-22 and the new plant on CFC-11/CFC-12. The feedback from the Plant personnel was that swing-over time is 15 days to get the right quality material. Based on the requirement and economics of operation the enterprise decided to operate the plants without swinging over. The Plant 2, which was operating on CFC-11/CFC-12 in 2004, has produced 8,044 MT. This is about 68% of capacity utilization of this plant. (8,044 /11,826).

The plant is ISO 9001 and ISO 14001 certified. Both plants are very well maintained. CFC-11 and CFC-12 are co-produced from CTC and HF reaction from a single reactor. The ratio of CFC-11 and CFC-12 can be varied as per requirement of production. The enterprise has taken trials for production of CFC-12 only, by recycling CFC-11.

The raw material storage of HF (Hydrofluoric Acid) is common for both the plants. However, flow meters are installed to measure the quantity sent to each plant. HF handling is carried out in an enclosed chamber. HF sensors are installed at various points for sounding alarm signals to detect leakage for timely action. The plant manufacturing CFCs was audited in detail. The methodology adopted and the process verification along with the copies of documents are listed below:

b. 2004 Opening Stock Verification

The closing stock of December 2003 was verified for CFC-11 and CFC-12. The stock records for the stocks in the plant warehouse were checked. Balance Sheet & Statement of operations Account duly audited by an external auditor for the year ending December 2003 was checked and co-related with inventory valuations (both in quantity and value) with the stock records as per the company's books of account. The financial records verified for CFC-11 and CFC-12 for the month of December 2003 are the Audited balance sheet, stock register and last year's data audited by Ess Jay Consultants. Based on these financial records and verification of raw material purchases, issues and inventory, the following are the accepted stock values in tons.

Attached as **Annexure 1** is the audited Balance Sheet for the year 2003 showing the inventory valuations as on January 1, 2004.

Opening Stock of raw material CTC in Jan. 2004	=	27 MT
Opening Stock of raw material HF in Jan. 2004	=	8.5 MT
Opening Inventory of CFC-11 in Jan.2004	=	82 MT
Opening Inventory of CFC-12 in Jan.2004	=	361 MT

c. 2004 Raw Material (RM) Verification

Both the major raw materials HF and CTC used for manufacturing of CFC-11/CFC-12 are procured from outside. The material procured is unloaded in raw material tanks, but if there is no space, the cargo is not unloaded but kept waiting; the stock at any given point of time includes stock in raw material tanks and the cargo waiting to be unloaded.

The list of total raw material (CTC and HF) purchases was taken from the finance department based on the approved quota from Government of Mexico to import the same. All the invoices for import of raw materials were checked; the quantity on the invoices was cross checked with the purchase figure in the purchase account and also the amount shown in the VAT returns submitted by the company to Revenue Authorities to claim IVA back from the Government and were found to be consistent. The system for raw material consumption accounting was also reviewed and found satisfactory.

The monthly consumption is calculated as the difference in inventory and purchases during the month. The allocation of raw material consumption combined for CFC-11 & CFC-12 is done by readings on flow meters. The allocation of raw material consumption between CFC-11 and CFC-12 is done by way of norms. The monthly raw material accounting report for the entire year is enclosed as **Annexures 2A & 2B**.

Total Purchase of CTC in the year 2004	= 11,219 MT
Total Purchase of HF in the year 2004	= 7,356 MT

d. CFC Production Verification:

The hourly feeds on the randomly selected days (26th March, 21st May, 22nd August and 30th December 2004), was integrated on a day-basis to verify the daily production, which is stocked in a ‘day tank’ and found to be consistent with records.

The daily production is recorded by reading the level gauge installed in day tanks. The day tanks have a level measurement facility and with the help of a pre-calibrated level-to-weight chart for each tank, production is calculated for every shift. Daily production is recorded by

cumulating such records for all three shifts of the day. Each product has two-day tanks and before transferring to the main tank, quality is approved by quality control lab.

All final records are based on month-end accounting. The monthly reported production comes from inventory difference in the day tanks, main tanks and the material transferred from plant to filling station. This is counted as gross production. Saleable filled stock is counted as net production and difference is considered as losses/ surplus.

Gross production is measured at the main tank and net production on the sales and final inventory. The enterprise has a good recovery system in the filling station for CFC-12 and HCFC-22, which ensures losses of only insignificant quantity (0.29%). The Plant has an excellent recovery system of residual gases in the filling pipeline, returned packages for refilling and the sampling point. Such gases, which are sucked back, are accounted as part of production.

On these dates, (26th March, 21st May, 22nd August and 30th December 2004) verification of process parameters and quality analysis data were checked and found satisfactory. Sample sheets of production logbook, quality records are included as Annexures 3A & 3B.

The raw material consumption norms for HF and CTC were verified and found to be consistent in 2004 over the months except for the month of January 2004 which was due to the low number of operating days. The raw material consumption norms for the year are comparable to the past years.

**Raw Material Consumption ratio**

<b>Raw Material</b>	<b>CFC-11</b>	<b>CFC-12</b>
Carbon tetrachloride (tones / ton of product)	1.1676	1.3265
Hydrogen fluoride (tones / ton of product)	0.1665	0.3780

The norms are comparable to good plants in the world. The trends of production plotted with CTC and HF consumption over the months in 2004 is shown graphically at the end of the Ex-Com Form 4.

e. Production to packaging transfer

Based on requirement, various packages are filled and transferred to the warehouse immediately. No stock is maintained in the filling station. The packaging bottles and cylinders are first evacuated and filled with the required gas. The system is connected for recovery of held up gas in tubes and pipelines. The following non-returnable packagings are used:

Jugs - 15 lbs, 30 lbs & 50 lbs

Bottles / cans 340gms, 1kg

The recycled packaging materials are cylinders, tonners and ISO container for filling bulk quantities. The process for filling bulk containers is the same except that the packaging are cleaned, inspected and painted if needed. The enterprise's products brand name is Genetron. However, for export purpose, generic packaging is also used. The filling system is semi-automatic. Records of filled material with different packaging are maintained on daily basis and entered in the system on the next day. The cumulative figure at the end of the month gives the total quantity of material filled during the month. This figure is used for calculating the monthly net production. A sample review of the system of record keeping for filled material was carried out at stores and filling station and found matching.

Samples of filled material were taken, one each of CFC-11, CFC-12 and HCFC-22. The pressure, weight and gas chromatography analysis was done and found the result matches the characteristics of the product. A copy of the GC analysis is enclosed as **Annexure 4**.

f. Sales and Closing Stock

The actual invoices raised in the month are accounted as sales. The monthly statement of sales is enclosed as **Annexure 5** (Month wise break-up of productwise CFC sales for Domestic and Export markets). Verification was done by randomly selecting invoices and verifying their accounting in sales register and also the VAT return. Closing Stock of raw materials and finished goods are computed and verified based on data given and verified as per the stock records and the un-audited balance sheet prepared by the company. The closing stock figures in financial records were then crosschecked with the quantities audited by the technical consultant. The



same are shown in **Annexure 6** (Monthly plant report, quantity and value of closing stock as per un-audited balance sheet).

Closing Stock of raw material CTC in Dec 2004	=	763 MT
Closing Stock of raw material HF in Dec 2004	=	278 MT
Closing Inventory of CFC-11 in Dec 2004	=	593 MT
Closing Inventory of CFC-12 in Dec 2004	=	1,842 MT

g. VAT Returns

The company files VAT returns on a monthly basis with the Revenue Authorities. An external auditor duly audits this every month. The return is being filed to claim IVA (the difference between tax paid and tax collected) from Government for extra taxes paid by the company. The data confirms the sales (both domestic and exports), purchases (both domestic and imports) made by the company during the month. The month of November 2004 was chosen for detailed verification of all the sales invoices to check the authenticity of the data. The VAT return for the month of November 2004 was checked by us during the course of the audit and found that the data for purchase and sales were matching with the figures shown in the books of accounts. Copy of the duly audited monthly VAT returns for the month of January to November 2004 as **Annexure 7** is attached. (Till the date of audit, the December 2004 VAT return was not audited by the external auditor)

**Annexure 8** shows the checklist of the audit process followed in keeping with the Guidelines and step taken in addition to the Guidelines.

**ANNEXURES**  
(1 to 8)

**Annexure 8****a. Check list of the audit process with the Guideline**

Sl.	Verification steps	Check by Ess Jay Consultants	Ess Jay Consultants observation
1	Confirm production and raw material consumption from production logs	Done	Production logs and financial records (purchase account, import licence etc.)
2	Verify sales and procurement of ODS products against financial records	Done	Sample verification done with the sales accounts, VAT return, Import of raw materials
3	Verify stock at the beginning and the end of year against financial records	Done	Found satisfactory and also confirmed the same with the audited balance sheet.

**b. Steps to be included in the audit**

Sl.	Verification steps	Check by Ess Jay Consultants	Ess Jay Consultants observation
1	Review system of record for adequacy	Done	Daily, Monthly record keeping is satisfactory
2	Observe plant condition and apparent operational status	Done	Well maintained plant
3	Audit daily production records and key feedstock consumption data	Done	Daily production logs verified to check process parameters and corresponding quality reports
4	Confirm monthly and annual production production = sales - change in inventory	Done	Matches
5	Confirm cumulative inventory change of ODS product corresponds to annual production	Done	Checked and found correct as per above report
6	Confirm cumulative inventory change of key raw material is consistent with production both overall and per campaign	Done	Very Consistent
7	Integrate hourly in-plant flow rate data over time to get an independent value for production	Done	Flow rate data compared with the daily production and found OK
8	Compare the changes in reported feed and product tank levels, integrated with the appropriate correction factor to report raw material usage and CFC production	Done	Raw material consumption accounting is on monthly basis.
9	On a spot basis, rationalize hourly plant logs with raw material consumption and production.	Done	System not in place
10	Review logs for periods of high hourly throughput and compare to reported production. Investigate any possible inconsistency	Done	Found consistent
11	Review hourly plant logs during non-campaign time periods to verify non-production	Done	Found consistent
12	Monthly VAT returns made by plant were audited	Done	Found satisfactory, through monthly VAT returns sales, (domestic & exports) & purchase checked against book of account.

**c. Steps taken in addition to the requirements of the Guideline**

13	Sampling for analysis, CFCs & HCFC-22	Done	Purity, Product verification, satisfactory
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