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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Forty-second Meeting
Montreal, 29 March - 2 April 2004

PROJECT PROPOSALS: MEXICO

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

Foam

- CFC phase-out plan for the foam sector (second tranche) — UNDP

Fumigant

- Technical assistance to comply with 2005 phase-out of 20% of methyl bromide — Canada/Spain/UNIDO

Phase-out

- National CFC phase-out plan (first tranche) — UNIDO

Production

- CFC production sector audit report for 2003 and sector plan for phasing out CFC-11 and CFC-12 production sector: 2004 annual implementation programme — UNIDO

PROJECT EVALUATION SHEET
MEXICO

SECTOR: Foam ODS use in sector (2002): 192 ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A

Project Titles:

(a) CFC phase-out plan for the foam sector (second tranche)

Project Data	**Multiple**
	National Plan
Enterprise consumption (ODP tonnes)	484.0
Project impact (ODP tonnes)	339.0
Project duration (months)	24
Initial amount requested (US $)	1,109,120
Final project cost (US $):	
Incremental capital cost (a)	
Contingency cost (b)	
Incremental operating cost (c)	
Total project cost (a+b+c)	1,109,120
Local ownership (%)	100
Export component (%)	0
Amount requested for second tranche (US $)	1,109,120
Cost effectiveness (US $/kg.)	3.27
Counterpart funding confirmed?	
National coordinating agency	Ministry of the Environment (SEMARNAT)
Implementing agency	UNDP

Secretariat's Recommendations	
Amount recommended (US $)	1,109,120
Project impact (ODP tonnes)	339.0
Cost effectiveness (US $/kg)	3.27
Implementing agency support cost (US $)	83,184
Total cost to Multilateral Fund (US $)	1,192,304

PROJECT DESCRIPTION

1. UNDP has submitted to the 42nd Meeting on behalf of the Government of Mexico a request for the release of the amount of US $1,109,120 and US $83,184 support cost for the second and final tranche (2004-2005 annual implementation programme) of the Mexico foam sector plan approved in principle at the 35th Meeting of the Executive Committee. The document consists of:

- Report of first phase implementation workplan (2002-2003); and
- Second phase implementation work plan.

Background information

2. The project was first submitted to the 30th Meeting of the Executive Committee in March 2000. Due to some data discrepancies and difficulties relating to policy issues, its approval was deferred at the 30th Meeting and subsequently also at the 32nd and 33rd Meetings. At the 35th Meeting, UNDP submitted a revised proposal for the sector phase-out plan to phase out an estimated 534 ODP tonnes within a four year period at the total cost of US $3,622,850. The Executive Committee in its Decision 35/47 approved the foam sector plan in principle with an initial release of US $843,150, including US $100,000 for management cost to phase out an identified CFC consumption of 145 ODP tonnes and requested UNDP to report on the status of implementation of the plan at the 38th Meeting. Decision 35/47 is reproduced in the attached progress report, "Report on the First Phase Implementation Work Plan". UNDP reported to the 38th Meeting, that due to some institutional difficulties, the implementation of the project had been delayed. Thus, four years has passed since the project for the phase-out of the CFC consumption in the remaining, mainly small and medium scale foam producing enterprises in the rigid and integral skin foam sub-sectors was first proposed to the Executive Committee.

Progress report

Audit of CFC and calculation of remaining eligible consumption in the foam sector

3. One of the main tasks of UNDP and the Government of Mexico during the first phase was to audit the consumption of the remaining enterprises in order to ascertain their eligibility for funding and their use of CFC. The attached progress report shows the results of the audit. The final audit confirmed a total 1999 consumption in the foam sector of 634 tonnes of blowing agents instead of 792 tonnes predicted earlier, made up of 484 tonnes of CFC-11 instead of 592 tonnes and 150 tonnes of HCFC-141b instead of 170 tonnes. When the consumption of the enterprises identified as ineligible for funding in the Mexico foam sector is taken into account the remaining CFC consumption eligible for funding would be 394 ODP tonnes based on 1999 consumption. This formed the basis for determining the level of funding for the phase-out of the remaining CFCs in the foam sector.

Implementation of the First Phase of the Foam Sector Plan

4. The amount of US $843,150 approved at the 35th meeting as advance for UNDP to implement the phase-out of 145 ODP tonnes and conduct final audits of the remaining enterprises consisted of US $723,150 for the investment programme and US $100,000 for management costs. The costs of the projects were calculated based on unit cost for each sub-sector. UNDP's progress report indicated that work began with 11 shoe sole (integral skin foam) and 10 rigid foam producing enterprises, both groups accounting for the 145 ODP tonnes of CFC. The report also indicated that the funding levels based on the agreed unit cost per sector had been exceeded and as a consequence the total amount of US $723,150 approved as a form of advance payment for the sector plan had been expended or committed.

Implementation Programme of Phase II of the Mexico Foam Sector Plan

5. The targets and activities, including government actions and expected costs are described in the attached annual implementation programme.

Consumption of CFC-11

6. The results of the audit showed that enterprises that were not eligible for funding accounted for 90 ODP tonnes out of the 484 ODP tonnes of CFC-11. Thus, the remaining eligible consumption was calculated to be 394 ODP tonnes. Mexico reported 2002 foam sector consumption of 192 ODP tonnes. This indicates that 202 ODP tonnes had been eliminated through voluntary actions by some enterprises. Furthermore, out of the 2002 consumption of 192 ODP tonnes, 145 ODP tonnes represented the consumption of the enterprises in the phase I implementation programme with CFC-11 consumption of 47 ODP tonnes remaining for unfunded enterprises still using CFC-11 as blowing agent. Hence, funding would be required to address 202 ODP tonnes of CFC-11 voluntarily phased out and the remaining 47 ODP tonnes attributed mainly to small scale rigid foam enterprises.

Project cost calculation

7. Against the background of the above analysis of CFC consumption in the foam sector, the cost of phase-out of the remaining CFC consumption in the foam sector was calculated as follows:

	US $
Funding required to assist enterprises which have ceased to use CFC following approval in principle of the plan based on comparable cost-effectiveness level of the phase I enterprises (US $3.96/kg for 202 ODP tonnes)	799,920
Funding for phase-out of remaining CFC consumption (47 ODP tonnes) for rigid foam SMEs at US $7.83/kg	368,000
Management cost	100,000
Less: funds spent in excess of agreed costs in the first tranche	(158,800)
Total	1,109,120
Support cost	83,184
Total cost to the Multilateral Fund	**1,192,304**
Cost-effectiveness (based on project impact of 339 ODP tonnes)	US $3.27/kg

Summary of the Cost of the Foam Sector Plan

8. The total cost of the Mexico Foam Sector Plan to be implemented in two tranches is indicated in the table below.

		First Tranche	Second Tranche	Total for Plan
	Management Cost (US $)	110,000	90,000	200,000
	Project Funding (US $)	723,150	1,019,120	1,742,270
	TOTAL (US $)	833,150	1,109,120	1,942,270
(i)	Overall cost-effectiveness based on eligible consumption of 394 ODP tonnes (US $/kg)			4.93
(ii)	Overall cost-effectiveness based on total consumption of 484 ODP tonnes			4.02

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

9. The Secretariat and UNDP discussed the issues raised by the delays in the implementation of the project. UNDP indicated that the institutional problems that earlier affected the implementation of the sector plan have been addressed. Therefore implementation in future is not likely to incur delays.

10. It also appeared that the delay encountered in the approval and implementation process had resulted in voluntary conversion to the use of alternative blowing agents by some enterprises which might still need some funding for refurbishment or possible replacement of their equipment to bring them level with their competitors.

11. The Mexico Foam Sector Plan would now be funded in two tranches instead of four as it was originally planned. The total cost of the plan of US $1,942,270 (with cost-effectiveness of US $4.93/kg) is 54 per cent of the original cost of the plan submitted to the 35th Meeting.

12. Mexico reported to the Ozone Secretariat total consumption of Annex A Group I substances of 2,223.9 ODP tonnes and 1,946.7 ODP tonnes for 2001 and 2002 respectively, against 2000 consumption of 3,059.5 ODP tonnes. Therefore, Mexico has permanently reduced its Annex A Group I consumption to a level not higher than its 2000 national aggregate consumption as required by Decision 35/4 (b) (iii).

13. The Mexico Foam Sector Plan unlike recent plans is not governed by an agreement between the country and the Executive Committee. However, to facilitate monitoring of the project, the Executive Committee may wish to request UNDP to provide annual reports on the progress of implementation of the plan.

RECOMMENDATIONS

14. The Fund Secretariat recommends blanket approval of the second phase implementation work plan of the Mexico CFC Phase-out Plan for the Foam Sector at the level of funding and associated agency support cost as indicated in the table below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	CFC phase-out plan for the foam sector (second tranche)	1,109,120	83,184	UNDP

15. The Fund Secretariat further recommends that the Executive Committee request UNDP to present annually at each first meeting of the year a progress report on the implementation of the Mexico Foam Sector Phase-out Plan until completion of the plan expected to be completed in 2006.

PROJECT EVALUATION SHEET
MEXICO

SECTOR: Fumigant ODS use in sector (2002): 1,067 ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Title:

(a) Technical assistance to comply with 2005 phase-out of 20% of methyl bromide

Project Data	**Fumigant**		
Enterprise consumption (ODP tonnes)			
Project impact (ODP tonnes)	18.2	107.2	36.9
Project duration (months)	18	18	18
Initial amount requested (US $)	224,070	707,965	528,862
Final project cost (US $):			
Incremental capital cost (a)	190,000	707,965	207,035
Contingency cost (b)			
Incremental operating cost (c)			
Total project cost (a+b+c)	190,000	707,965	207,035
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
Amount requested (US $)	190,000	707,965	207,035
Cost effectiveness (US $/kg)*			
Counterpart funding confirmed?	n/a	n/a	n/a
National coordinating agency	Secretariat of the Environment (SEMARNAT)		
Implementing agency	Canada	Spain	UNIDO
Total for project	US $1,105,000		

Secretariat's Recommendation			
Amount recommended (US $)			
Project impact (ODP tonnes)			
Cost effectiveness (US $/kg)*			
Implementing agency support cost (US $)			
Total cost to Multilateral Fund (US $)			

*Overall cost effectiveness for the entire project is US $6.80/kg

PROJECT DESCRIPTION

16. The Government of Mexico submitted a national methyl bromide (MB) phase-out plan for consideration by the Executive Committee at its 41st Meeting, requesting assistance only to reduce its MB consumption by 318.8 ODP tonnes (28.2 per cent of the MB baseline for compliance). Upon a request by the Government of Mexico, the project was withdrawn.

17. The Government of Mexico is resubmitting the proposal as a technical assistance programme to comply with the phase-out of 20 per cent of the MB baseline consumption in Mexico by 2005 (phase-out of 162.4 ODP tonnes). The project will be implemented with the assistance of the Governments of Canada and Spain (through bilateral cooperation) and UNIDO (the lead implementing agency in the soil fumigation sector).

MB uses

18. In 2000, 2001 and 2002, the total MB consumption in Mexico was 867 ODP tonnes, 1,100 ODP tonnes and 1,067 ODP tonnes, respectively. The MB baseline for compliance is 1,130.8 ODP tonnes.

19. MB is used in the fumigation of soil or substrates in the following crops:

Crop	Total area (ha)	Area using MB	MB (ODP tonnes)	No. of farmers
Strawberries	630	916	187.9	15
Tomato	12,569	1393	315.8	179
Chile Bell	3,972	489	116.3	66
Melon	1,120	588	88.2	98
Berries	378	265	52.7	83
Tobacco		126	17.8	1
Garlic	240	185	40.5	28
Other	262	238	53.3	78
Flowers	347	347	74.7	133
Total	19,518	4,547	947.2	681

20. MB is also used by about 1,200 fumigators for fumigation of the following commodities and structures to control a wide range of pests:

Applications	MB (ODP tonnes)
Warehouses and silos containing grain and other stored products	58.8
Flour mills, food factories	38.4
Wooden materials (non-QPS)	4.8
Museums, historical buildings	3.0
Trucks, railcars, ships, airplanes	7.8
Miscellaneous (dry chilli, spices, dried fruit, nuts, tobacco products)	7.0
Total	119.8

21. The reported levels of MB for QPS applications in Mexico are: 359 ODP tonnes in 2000; 715 ODP tonnes in 2001 and 155 ODP tonnes in 2002.

22. Presently, all importers of MB are registered in the Inter-Secretarial Commission for the Control of the Process and Use of Pesticides, Fertilizers and Toxic Substances. All import licenses are subject to the approval by this Commission, which in turn is subject to approval by the Ministry of the Environment and Natural Resources.

Demonstration projects

23. So far, the Executive Committee has approved two MB demonstration projects for Mexico:

(a) Alternatives to the use of MB in the cultivation of tomatoes, strawberries, tobacco, melons, and cut flowers (25th Meeting, at a total cost of US $790,350), to demonstrate alternate technologies in small surfaces and test the most promising ones on a larger area (10 ha); and

(b) Alternatives to MB for structural fumigation in Mexico (26th Meeting, at a total cost of US $498,300), to demonstrate and evaluate seven MB alternatives (phosphine alone and in combination, integrated pest management, diatomaceous earth, deltamethrin, heat and cold treatments) in a range of storage and structural facilities.

Phase-out strategy

24. Mexico has now submitted a project, which, to comply with the 2005 control measure for MB the Government of Mexico will:

(a) Enforce MB import restrictions to ensure a maximum consumption level of 904.6 ODP tonnes of MB by January 2005;

(b) Implement a training programme with all MB users on available alternative technologies. The Government of Mexico has decided that specific alternatives will not be imposed on farmers and, therefore, no compensation for equipment or increased operational costs is proposed. The MB phase-out activities will focus on awareness, training, verification and dissemination of results achieved by those farmers who are volunteering to achieve substantial reductions in their consumption;

(c) Implement technology transfer phase-out programmes working closely with farmers;

(d) Verify reductions in MB consumption at the regional, state and country levels;

(e) Decide in due course the post-2005 MB phase-out schedule.

25. The proposed alternative technologies, which have been tested in the demonstration projects already implemented include: the use of an alternative chemical for soil fumigants alone or with solarization and the use of non-chemical alternatives (bio-fumigation, soilless substrates,

steam, floating tray system and grafting). For commodities and structure fumigation, the proposed technologies include phosphine (tablets or pellets); grain protectants (cyfluthrin, chlorpyrifos methyl, malathion, delta-methrin, DE or neem); cold treatments; heat treatments; controlled atmospheres or vacuum-hermetic systems; and carbon dioxide or other inert gas. All the proposed technologies will be implemented together with integrated pest management systems.

26. The total cost of the technical assistance programme is US $1,460,897 (US $1,236,827 for soil fumigation and US $224,070 for commodities fumigation). The phase-out of MB as a soil fumigant will be implemented jointly by the Government of Spain and UNIDO and the fumigation of stored products by the Government of Canada.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

27. The Secretariat reviewed the project proposal in light of the national MB phase-out plan which was submitted to the 41st Meeting of the Executive Committee and subsequently withdrawn by the Government of Mexico.

Objectives and scope of the proposal

28. The MB phase-out plan was prepared according to the revised strategy and guidelines for projects in the MB sector (Decision 32/80), and on the basis of the results of the two MB demonstration projects implemented in Mexico. In this regard, the Secretariat pointed out that the technical assistance programme, as submitted, would constitute double counting since activities similar to those being proposed and having the same overall objectives have already been implemented. UNIDO indicated that the proposed activities in the technical assistance programme differ from those in the demonstration projects. The overall objective of the project submitted to the 42nd Meeting is to provide technical assistance to MB users to reduce their MB consumption in order to achieve the 20 per cent reduction step in 2005 proposed by the Government. However, it would be necessary to identify farmers/users who are willing to voluntarily participate in the technical assistance programme. During the preparation of the MB phase-out plan, some MB users were identified. However, because of misunderstandings arising from the requests for critical use nominations (CUNs) for MB, many farmers decided to review their previous phase-out plans.

Cost related issues

29. The Secretariat noted that some project components were not eligible for funding or their costs could not be justified. Specific issues and UNIDO's responses are indicated below:

(a) Workshops for technology selection (US $140,000) and workshops for technology evaluation and follow-up (US $140,000) would constitute double counting taking into account that alternative technologies have already been

demonstrated and the results have been discussed with major stakeholders; and the alternative technologies for each crop and application for a complete phase-out of MB have been selected;

UNIDO indicated that the workshops which are addressed to individual farmers/users, are the key elements of the strategy proposed by the Government of Mexico. The latter does not intend to impose a single alternative technology for a complete sector, but rather inform the farmers/users about all technical options available and support their own individual decisions.

(b) The costs for national and international consultants (US $753,638, representing almost 57 per cent of the total cost of the programme), cannot be justified taking into account that the majority of the MB alternative technologies have already been demonstrated in Mexico; the short period of time available to achieve the 20 per cent MB phase-out; and that no MB alternative technology will be implemented at this time.

UNIDO indicated that the consultant component is very important in a technical assistance project, since the project does not include any investment component. Furthermore, due to the limited time available to achieve the required MB phase-out (by the end of 2004), the involvement of consultants is essential, because farmers need to accelerate the application of alternatives to compensate for the 20 per cent reduction in the amount of MB which will be available from 2005. The implementation of alternatives is essential, as the project has to ensure the sustainability of this process. Furthermore, the strategy of the Government is not to fund, at this time, any equipment purchase (in order to allow full flexibility in farmer's individual decision about alternatives) and to concentrate all project funds just on training/technical assistance.

(c) The number of trips (148) needs further justification (travel and communication costs at US $90,750).

UNIDO indicated that the strategy of the Government of Mexico to work with selected and voluntary farmers in different states, with different crops and in the period of time available, the numbers of trips are well justified.

Alternative approach

30. The Secretariat proposed to the Governments of Canada and Spain and UNIDO an alternative approach to cost the technical assistance programme taking into consideration:

(a) That the Government of Mexico requires assistance to meet the 2005 MB phase-out target;

(b) The strategy proposed by the Government to work first with farmers who are well informed or have been involved in testing MB alternative technologies, and to have a balanced phase-out in different crops and applications; and

(c) The Multilateral Fund rules and policies.

31. Based on the above considerations, the Secretariat estimated an average cost effectiveness value for the first phase of the project proposal (e.g., the phase-out of 162.4 ODP tonnes of MB), at US $6.50/kg. For the calculation of the proposed cost effectiveness value, the Secretariat used the values associated with the phase-out of MB in tomatoes, chili bells, strawberries, melons, berries, and garlic as submitted in the national phase-out plan. For cut flowers and commodity fumigations, cost effectiveness values of US $15.00/kg and US $11.50/kg, respectively (which are similar to other projects so far approved by the Executive Committee) instead of values in the phase-out plan (US $33.70/kg for flowers and US $32.40/kg for commodities) These values are summarized in the table below:

Crop/application	ODP	$capital	$operating	$training	$contingency	$total	US$/kg
Tomatoes	315.8	434,540	132,197	394,445	82,898	1,044,080	3.31
Chile	116.4	162,907	46,013	145,438	30,834	385,192	3.31
Strawberries	187.9	122,465	254,428	33,054	15,552	425,499	2.26
Melons	88.2	911,062	(34,671)	330,953	124,202	1,331,546	15.10
Berries	52.7	44,068	154,777	182,899	22,697	404,441	7.67
Garlic	40.5	81,600	79,968	61,701	14,330	237,599	5.87
Horticultural	53.3	139,320	132,379	171,881	31,120	474,700	8.91
Flowers	74.7					1,120,500	15.00
Commodities	119.8					1,377,700	11.50
Subtotal	1,049.3	1,895,962	765,091	1,320,371	321,633	6,801,257	6.48
Tobacco	17.8			-	-	-	
Total	1,067.1	1,895,962	765,091	1,320,371	321,633	6,801,257	6.37

32. The 17.5 ODP tonnes of MB used for fumigation of tobacco seedbeds were not considered in the calculation of the average cost effectiveness value, taking into consideration that no funding would be requested from the Fund to phase out this consumption. The Government of Mexico would have flexibility in using the resources available for the phase-out of MB in any crop or application it deems more appropriate.

33. UNIDO declined to adopt the cost model proposed by the Secretariat on the grounds that capital and operating costs and cost effectiveness values were not applicable and did not address the needs of a technical assistance programme, which had a strong training component. However, subsequently, the Governments of Canada and Spain and UNIDO agreed to adjust the project proposal as follows: US $915,000 (to be implemented jointly by the Government of Spain and UNIDO) and US $190,000 (to be implemented by the Government of Canada). On this basis, the Secretariat was able to agree with the bilateral and implementing agencies on the total prop posed cost of US $1,105,000.

34. The Secretariat notes that the revised cost of the project is similar to the cost arrive at by the Secretariat using the proposed average cost effectiveness value.

RECOMMENDATION

35. Based on the above considerations, the Executive Committee may wish to consider approval of the project proposal.

PROJECT EVALUATION SHEET
MEXICO

SECTOR: Phase-out ODS use in all sectors (2002): 1,944.7 ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A

Project Titles:

(a) National CFC phase-out plan (first tranche)

Project Data	**Multiple**
	National Plan
Enterprise consumption (ODP tonnes)	1,944.7
Project impact (ODP tonnes)	1,669.0*
Project duration (months)	70
Initial amount requested (US $)	3,517,000
Final project cost (US $):	
Incremental capital cost (a)	
Contingency cost (b)	
Incremental operating cost (c)	
Total project cost (a+b+c)	8,794,500
Local ownership (%)	100
Export component (%)	0
Amount requested for first tranche (US $)	3,517,000
Cost effectiveness (US $/kg.)	5.26**
Counterpart funding confirmed?	
National coordinating agency	Ministry of the Environment (SEMARNAT)
Implementing agency	UNIDO

Secretariat's Recommendations	
Amount recommended (US $)	
Project impact (ODP tonnes)	
Cost effectiveness (US $/kg)	
Implementing agency support cost (US $)	
Total cost to Multilateral Fund (US $)	

* The total impact of the plan is 1,669.0 ODP tonnes. The impact of the first tranche is 0 ODP tonnes.

** Cost-effectiveness of the phase-out plan.

Sector background

CFC (Annex A Group I) Consumption and Phase-out Profile

According to Decision 35/37 Mexico selected Option 1 as starting point. At the 35th Meeting an agreement was reached with the Executive Committee regarding the starting point amounting to:	3,059.5 ODP tonnes
- Remaining consumption of CFCs eligible for funding as at February 2004 (per the above agreement)	2,483.3 ODP tonnes
- Total CFC consumption in 2002	1,967.0 ODP tonnes
- Total ODP in on-going projects as of February 2004.	237.2 ODP tonnes

Project Description

36. Prior to the 41st Meeting, a proposed Refrigeration Sector Phase-out Plan for Mexico, including a draft agreement, was agreed between the Secretariat and UNIDO and submitted for consideration by the Executive Committee. The full description of the project can be found in UNEP/Ozl.Pro/ExCom/41/48. In the course of consideration of the project by the Executive Committee, it was proposed that the refrigeration sector plan be re-formulated as a comprehensive national CFC phase-out plan for Mexico incorporating the remaining CFC consumption in other sectors. It was recognized that, to be consistent with the approved phase-out plan in the production sector, certain amounts of CFCs would need to be stockpiled. This was to be reflected in a new draft agreement. The project proposal was deferred and Decisions 41/69 was taken.

37. On behalf of the Government of Mexico, UNIDO has reformulated the refrigeration sector phase-out plan and submitted a National CFC Phase-out Plan (the Plan) to phase out the remaining consumption of 1,967 ODP tonnes of Annex A, Group I controlled substances in Mexico over the period 2003 - 2010. The Plan will enable the Government of Mexico to phase-out CFC consumption by 1 January 2010.

38. The majority of CFC consumption addressed in the Plan occurs in the refrigeration sector. The Plan incorporates phase-out activities in on-going projects in the foam, aerosol, and sterilant sectors. The Plan indicates that consumption of 5.0 ODP tonnes in the metered dose inhaler (MDI) sector will be on-going until 2009 and will be phased out in 2010 within the funding requested for the implementation of the Plan.

39. According to the Plan, the estimated CFC demand will be higher in 2003 and 2004 than the demand in 2002. It will start decreasing in 2005. In 2007, the estimated demand will exceed the control target established by the Montreal Protocol. However, the CFC consumption to be reported under Article 7 will be consistent with the maximum consumption limits established by the Protocol for Mexico since the domestic demand will be met from the stockpile. It is expected that the CFC consumption in all manufacturing sectors will be phased out by 2006 except the use of 5.0 ODP tonnes in the metered dose inhaler (MDI) sector, which may be phased out in 2009. There will be a remaining demand for virgin CFCs in the refrigeration service sector after 2006. This demand will be reduced with new activities in training, recovery/recycling and retrofitting

of refrigeration equipment proposed in the Plan. Mexico will achieve the 50% reduction target in 2005, the 85% reduction target in 2007 and zero consumption after 2010 in terms of the CFC consumption defined in Article 1 of the Montreal Protocol as Production + Import - Export, which will be reported as per Article 7 of the Protocol.

40. CFC production will cease in 2005 according to the existing agreement in the production sector in Mexico. The demand after 2005 will be met mainly from the stockpile, which will be accumulated by a surplus in production of CFCs in 2004 and 2005 within the limits determined by the above agreement.

41. The consolidated information on CFC demand and the proposed CFC reduction schedule is presented in the table below.

Year	**2002**	**2003 estimate**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
	(in ODP tonnes)								
Montreal Protocol Reduction Schedule	4,625	4,625	4,625	2,312	2,312	694	694	694	0
Consumption as Article 7 data	**1,944**	**1,989**	**4,300**	**2,312**	**500**	**400**	**300**	**200**	**0**
Annual change in stockpiling	18	17	2,349	411	-915	-631	-381	-131	0
Total demand in all sectors	1,926	1,972	1,952	1,902	1,415	1,031	681	331	0
Total reduction by on-going activities, all sectors	0	0	20	0	192	85	0	0	0
Total reduction by new activities, all sectors	0	0	0	50	294	300	350	350	331
Total annual reduction, all sectors	0	0	20	50	486	385	350	350	331
Industrial aerosol sector demand	70	70	70	70	70	0	0	0	0
reduction by on-going activities	0	0	0	0	0	70	0	0	0
reduction by new activities	0	0	0	0	0	0	0	0	0
MDI sector demand	5	5	5	5	5	5	5	5	0
reduction by on-going activities	-	0	0	0	0	0	0	0	0
reduction by new activities	-	0	0	0	0	0	0	0	5
Foam sector demand	192.0	192	192	192	0	0	0	0	0
reduction by on-going activities	0.0	0	0	0	192	0	0	0	0
reduction by new activities	0.0	0	0	0	0	0	0	0	0

Year	2002	2003 estimate	2004	2005	2006	2007	2008	2009	2010
	(in ODP tonnes)								
Sterilant sector demand	14.5	14.5	14.5	14.5	14.5	0	0	0	0
reduction by on-going activities	0	0	0	0	0	14.5	0	0	0
reduction by new activities	0	0	0	0	0	0	0	0	0
Refrigeration sector demand	1,644.1	1,690.0	1,669.6	1,619.6	1,325.4	1,025.4	675.4	325.4	0
reduction by on-going activities	0	0	20.4	0	0	0	0	0	0
reduction by new activities	0	0	0	50.0	294.2	300.0	350.0	350.0	325.4

42. The Government of Mexico will formulate a detailed regulation to monitor and control the use of ozone depleting substances (ODS) in the country. The most significant elements of the regulation will be:

- Gradual reductions in ODS use in all sectors consistent with the Montreal Protocol's obligations. The rule would be compulsory for all producers, importers, exporters, distributors, vendors and commercial and industrial consumers of CFCs;
- Trade in CFCs will only be permitted to satisfy basic domestic 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;
- Prohibition of the production or import 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;
- The regulation will also establish rules to control the trade in recycled or reprocessed CFCs.

43. There is no significant change in the phase-out activities in the present Plan compared to the Refrigeration Sector Plan submitted to the 41st Meeting. The same level of funding is requested for approval at the 42nd Meeting with the following break down:

Project component	Sub total	2004 Tranche	2005 Tranche	2006 Tranche
Project management and technical support	799,500	350,000	350,000	99,500
Refrigeration manufacturing sector program	300,000	300,000		
Customs training	338,700	338,700		
National project for training of service technicians	1,928,300	1,928,300		
National refrigerant recovery and recycling project	4,928,000	600,000	4,328,000	
Incentive program for retrofitting and replacement	500,000		300,000	200,000
Total project cost	**8,794,500**	**3,517,000**	**4,978,000**	**299,500**
Implementing agency overhead	659,588	263,775	373,350	22,463
Total grant	**9,454,088**	**3,780,775**	**5,351,350**	**321,963**

44. The overall management of the Plan will be carried out by the Government of Mexico with the assistance of UNIDO.

45. The implementation of the Plan will need to be closely linked and coordinated with the various policy, regulatory, fiscal, awareness and capacity-building actions which the Government of Mexico is executing in order to ensure consistency with Government priorities.

46. Monitoring of the consumption of ODSs will be undertaken by the Government at the companies to be converted to non-ODS technologies. After the establishment of the country-wide scheme for refrigerant recovery and recycling, the monitoring activity will be extended to include all recycling centres and servicing shops. The licensing system will be a tool to monitor and to ensure compliance with the control measures.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

47. The CFC consumption reported by Mexico in 2002 was 1,926 ODP tonnes. According to the records available in the Secretariat, CFC consumption in all on-going projects in Mexico is 237.2 ODP tonnes. The total CFC phase-out impact of the National Phase-out Plan will be 1,706.8 ODP tonnes.

48. The majority of the remaining consumption in Mexico is in the refrigeration sector. The phase-out schedule in this sector was agreed with UNIDO and included in the draft agreement presented to the 41st Meeting as part of the Refrigeration Sector CFC Phase-out Plan. The phase-out schedule of the Plan (primarily based on the refrigeration sector phase-out schedule) has been revised. The proposed consumption limits have been increased starting from 2005 onwards. In 2007, the projected CFC demand of 1,031 ODP tonnes will exceed the control limit (694 ODP tonnes) established by the Montreal Protocol for Mexico by 337 ODP tonnes. Under the revised phase-out schedule in the Plan, the total ODP emissions for the period 2003 - 2010 will increase by 1,227 ODP tonnes compared to the draft agreement presented at the 41st

Meeting. CFC consumption data for the period 1998-2002 reported by the Government of Mexico to the Secretariat as part of country programme implementation reports indicate the steady decline of CFC demand for refrigeration servicing in Mexico (from 2,400 ODP tonnes in 1998 to 1,600 ODP tonnes in 2002). As indicated above the CFC consumption in the refrigeration servicing sector represents the majority of the national CFC demand in Mexico. The Secretariat requested clarifications from UNIDO as to why the forecast refrigeration sector consumption had been revised upwards from that presented to the 41st Meeting in each year from 2005-2009. The Secretariat proposed that UNIDO reassess the projected CFC demand and CFC reduction schedule based on actual needs and aimed at the reduction of the increased environmental impact of the revised Plan.

49. The CFC demand after 2005 will be met entirely from the stockpile accumulated prior to the cessation of production. The Secretariat indicated to UNIDO that the level of stockpiling was expected to be consistent with the actual needs of the country after production and Article 7 consumption ceases, including needs for the servicing tail beyond 2010, and consistent with production levels in the production sector agreement prior to the cessation of production.

50. In the foam sector, the Secretariat proposed that UNIDO should reflect in the Plan the information recently received from UNDP regarding the revised phase-out schedule for the sector.

51. The issues raised above as well as a draft agreement between the Executive Committee and the Government of Mexico are being discussed with UNIDO. Advice on the outcome of these discussions will be provided prior to the meeting of the Executive Committee as appropriate and taking into account the requirements of Decision 41/80.

RECOMMENDATIONS

52. Pending.

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MEXICO CFC PRODUCTION SECTOR AUDIT REPORT FOR 2003 AND SECTOR PLAN FOR PHASING OUT CFC-11 AND CFC-12 PRODUCTION SECTOR IN MEXICO: 2004 ANNUAL IMPLEMENTATION PROGRAMME

Background

53. The Executive Committee at its 40th 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 total CFC production of 22,000 MT for the duration of 2003-2005, and at the same time not exceeding the maximum allowable production limit specified in the Agreement in any of the three years. 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	2004
# of years completed	1
# of years remaining under the plan	3
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
Maximum Allowable 2004 production proposed	10,400MT
Total funding approved in principle for the CFC phase-out plan	US $31.85 million
Total funding released as of Dec. 2003	US $5.3 million
Level of funding requested for 2004 Annual Plan	US $10.7 million

54. The release of the funding tranches subsequent to 2003 is made conditional on the submission by UNIDO of the independent verification of the production in the preceding year within the Montreal Protocol requirement and within the total allowable production limits of the Agreement, and a work programme for the year of plan. Accordingly UNIDO is submitting the verification of the 2003 CFC production in Mexico, including the 2004 annual work programme at a funding level of US $10.7 million plus US $802,500 as support cost.

Verification of the 2003 CFC production in Mexico

55. The verification was carried out by Ess Jay Consultants, a consulting firm in India in January 2004. Three of the individuals reported to be involved in the audit have an engineering background and one of them has experience as a manufacturer of CFC and chloromethane products. The report includes an executive summary, the report proper 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 describes 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, since 1995 only one plant has continued producing CFCs while the other is dedicated to HCFC-22 production. The plant tested to produce CFC-12 only by recycling CFC-11 in 2003 presumably due to the decrease in the demand for CFC-11.

56. The verification reports on the auditing of the opening stock of CFC-11 and CFC-12 and the feedstock CTC and HF from the financial records and the warehouse for the year 2003. Then the report describes the verification of the consumption of raw materials in 2003 by checking the list of purchases from the finance department and cross-checking of a select number of invoices. There is 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 verification reports to have checked a few days of records as a sample to confirm the CFC production. The raw material consumption ratio was also checked against the historic record and industry norms and is reported as acceptable.

57. There is then the examination of the packaging of CFC products and a description of the process followed in the plant. There is a sample check of the accounting records of the packages, a check on the weight of the different packages and gas quality check through gas chromatography. The verification finally looks at the sales records and the closing stock of CFC products and the feedstock. The report also includes 10 annexes with copies of the original records that were examined.

58. The results of the verification are that Quimobasicos produced 8,694 MT of CFCs in 2003 which was broken down into 1,291 MT of CFC-11 and 7,402 MT of CFC-12. This is below the annual maximum allowable production level of 12,355 MT, and after reducing the 2003 production from the total maximum allowable production of 22,000 MT for 2003-2005, the remaining maximum allowable production for 2004-2005 would be 13,306 MT. The total sales of CFCs by the plant in 2003 were 8,844 MT, which included about 150 MT from the inventory. The breakdown between domestic and overseas sale was 967 MT for domestic and 7,877 MT for export.

59. 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 of feedstock of CTC and HF as a way of validating the CFC production.

The 2004 work programme

60. The 2004 work programme includes three parts, a project summary, 2003 annual work programme achievements and the objectives and activities of the 2004 work programme. The project summary includes the target and funding level for the 2004 work programme. A maximum of 10,400 MT of CFCs are set as the target for the CFC production level in 2004, which requires a funding level of US $10.7 million and US $802,500 as support costs.

61. The achievement of 2003 work programme reports on a total CFC production of 8,694 MT by Quimobasicos, which is below the annual maximum allowed production of 12,355 MT prescribed in the Agreement. Of the US $5.3 million disbursed for the 2003 work programme, US $4,998,500 was to be disbursed as compensation to Quimobasicos and the balance of US $301,500 was allocated to technical assistance activities to be implemented within 2003 and 2004. There were a number of policy measures which were planned and implemented in 2003 to facilitate the implementation of the CFC production phase-out. This included an import licensing control on CFCs and CTC, a legally enforceable production quota system for CFC producers, quarterly reporting by CFC producers to the national ozone unit on production, periodic visits by government officials to CFC producers, and penalty clauses for exceeding production quota or providing false information. A number of technical assistance activities were planned for 2003 and 2004, which included public awareness campaigns, training of CFC traders and customs officers, and establishing an information management system.

62. The 2004 target of a maximum allowable production level of 10,400 MT will be implemented through a mandatory CFC production quota introduced in January 2004 and the control on the import of CTC. 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 12,000 MT in 2004. Of the total US $10.7 million being requested for 2004, US $10.6 million will be disbursed to Quimobasicos for keeping the production quota and the balance of US $0.1 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, training, technical audit, and general project management. The 2004 work programme concludes with a time schedule and estimated costs of the technical assistance activities for 2004 and 2005.

Comments

63. The 2004 work programme proposes as the maximum allowable CFC production in Mexico at 10,400 MT, which is within the CFC production baseline for Mexico of 12,355 MT and also the annual maximum allowable production limit set in the Agreement. The total production of 8,694 MT in 2003 and the proposed target for 2004 is 19,094 MT, which is within the maximum total allowable production of 22,000 MT for 2003-05. That leaves the maximum allowable production for 2005 at 2,906 MT, which is within the allowable production level of 6,739 MT set for the year in the Agreement.

64. The Government of Mexico has introduced in January 2004 the mandatory CFC production quota system to control the production of CFCs in addition to the existing control on

the import of CTC, a major feedstock for the CFC production. There are also a number of other facilitating measures adopted by the Government for the implementation of the production phase out, including a quarterly report of production to the national ozone unit by the CFC producer.

65. This is the first verification exercise implemented under the Mexican CFC production agreement and there is an effort to comply with the guidelines for verifying ODS production phase out. However according to the guidelines, the verification team should include a member with financial accounting expertise, which the verification team in Mexican audit was not equipped with. There should be a more detailed description of the methodology and specific steps that were undertaken by the verification team during their plant visit.

66. The verification introduces the concept of net production and defines it as the actual production minus filling loss. The reported loss is only 1 MT and the total verified production did not deduct this from the actual production. However the report states that the concept of net production is in accordance with the Agreement. It is important to clarify that the concept is never used in the Agreement because:

(a) It is not consistent with the definition of production used under the Montreal Protocol where a metric ton of CFC produced is recorded as such irrespective of whether it is sold or not. Further, the compliance of a country with the obligations of the Protocol is measured by the CFC produced not sold. This is also the definition which is applied under the Multilateral Fund, mandated to assist in achieving compliance.

(b) It does not promote the environmental goal of the Montreal Protocol, because if filling losses are not accounted for, the incentive is not provided to the CFC producers to reduce these losses and therefore reduce the emissions of CFCs into the atmosphere.

67. In accordance with the practice of presenting the verification reports of CFC production, the Secretariat includes only the aggregate data, and not the annexes except the one which illustrates in graphics the correlation between the consumption of CTC and HF to CFC production. However the annexes could be made available to any member of the Executive Committee upon request.

Recommendations

68. The Secretariat recommends that the Executive Committee:

(a) Takes note of the verification report of the 2003 CFC production.

(b) Approves the 2004 work programme of the Mexican CFC production phase out Agreement at US $10.7 million and US $802,500 as support cost for UNIDO.

(c) Requests the future verifications to include greater detail about the methodology used and specific steps undertaken.

(d) Requests UNIDO to include in the verification team a member with financial accounting background.

(e) Requests UNIDO and other relevant implementing agencies to use actual tons of CFC and other ODS produced and not sold, to record and verify CFC and other ODS production phase out.

MEXICO

CFC Phase-out Plan for the Foam Sector

Second Phase Implementation Work Plan (2004-2005)

&

Report on First Phase Implementation Work Plan (2002 – 2003)

Prepared by the United Nations Development Programme
The dedicated Implementing Agency

MEXICO NATIONAL CFC PHASE-OUT PLAN
ANNUAL IMPLEMENTATION PROGRAMME (SECOND TRANCHE)

1. **Data**

Country	Mexico
Year of plan	2004
# of years completed	2
# of years remaining under the plan	2
Target ODS consumption of the preceding year	339t *
Target ODS consumption of the years of plan	0 t
Level of funding requested	$1,109,120
Lead implementing agency	UNDP
Co-operating agency	None

*Note: 484t in 1999 minus 145t approved in 1st tranche

2. **Targets**

Target: Foam Sector (excluding foams for refrigeration applications)				
Indicators		**Preceding Year**	**Years of Plan**	**Reduction**
Supply of ODS	Import	n/a	n/a	n/a
	Production*	n/a	n/a	n/a
	Total (1)	n/a	n/a	n/a
Demand of ODS	Manufacturing	339	69/2004 0/2005	270/2004 339/2005
	Servicing	n/a	n/a	n/a
	Stock piling	n/a	n/a	n/a
	Total (2)	**339**	**69/2004 0/2005**	**270/2004 339/2005**

3. **Industry Action**

Sector	**Consumption Preceding Year (1)**	**Consumption Years of Plan (2)**	**Reduction within Year of Plan (1)-(2)**	**Number of Projects Completed**	**Number of Servicing Related Activities**	**ODS Phase-Out (in ODP t)**
Manufacturing						
Aerosol	n/a	n/a	n/a	n/a		n/a
Foam	192*	0	192	0		339
Refrigeration	n/a	n/a	n/a	n/a		n/a
Sub-Total	**192**	**0**	**192**	**0**		**339**
Servicing						
Refrigeration	n/a	n/a	n/a	n/a	n/a	n/a
Sub-Total	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a

* As reported by SEMARNAT

4. Technical Assistance

4.1 FOAM MANUFACTURING

Proposed Activity:	**Prepare implementation plans**
Objective:	Plan the implementation in all details
Target Group:	Remaining foam sector enterprises
Impact:	No ODP impact.

Proposed Activity:	**Prepare disbursement plan for retroactive reimbursement**
Objective:	Reimbursement for costs incurred for voluntary phase-out
Target Group:	Foam sector enterprises with voluntary phase-out completed
Impact:	202 ODP tons voluntarily phased out

Proposed Activity:	**Prepare specifications and request bids**
Objective:	Make arrangements for equipment supplier selection
Target Group:	Equipment manufacturers
Impact:	No ODP impact.

Proposed Activity:	**Workshops with identified ODS users.**
Objective:	to confirm (i) the conversion plan, (ii) to present bidding results and (iii) to document commitment.
Target Group:	Remaining ODS-consuming foam sector enterprises
Impact:	No ODP impact.

Proposed Activity:	**Issue purchase orders for equipment**
Objective:	Equipment replacement and retrofit delivery and installation
Target Group:	Equipment manufacturers
Impact:	No ODP impact.

5. Government Action

The Control Measures listed below are under consideration. Some will definitely be implemented; the others have to be evaluated carefully before a final decision is taken.

	Policy/Activity Planned	Schedule of Implementation
1	Ban on use of CFC in the foam sector	2005, or once foam sector conversion is near completion
2	Tightening of the CFC-11 quota system	Implemented through a decree classifying ODSs as toxic substances and subject to the CICLOPAFEST (Inter-secretarial Coordination on Pesticides, Fertilizers and Toxic Substances) procedures, consequently enabling the country to implement an import license system and control procedures for CFCs and CTC, particularly at customs entry points.
3	Institution of a compliance monitoring system	Established in Phase 1; on-going through completion of sector phase-out plan
4	Ban on starting new foam manufacturing facilities that use CFCs, to prevent further growth of the use of CFCs use in the sector	From 1993 on, The Government of Mexico has discouraged the installation of any new CFC consuming facility in the country, with emphasis on the original equipment manufacturing (OEM) sector. This has been effected through the industrial operation's license system required by Mexican Law for the installation of any new production facility in the Country.

5	Regulations under preparation	NOM-XXX-ECOL-2003 (final number has not been assigned yet): Includes the regulatory framework to control the use of ODS in all sectors including methyl bromide. It also establishes restrictions on national production and import of freezers and domestic/commercial air conditioning units containing or produced with ODSs. Law for Prevention and Control of Climate Change: Includes the general strategy for prevention, control and policy evaluation of greenhouse gases and other substances such as ODSs.

6. Budget for 2004

Activity	Planned Expenditures (US$)
Foam Manufacturing Sector	
Management Costs (including technical assistance)	100,000
Retroactive funding for CFC-11 voluntarily phased out following approval of plan at US$3.96/kg (202 ODP tons)	799,920
Funding for phaseout of remaining CFC at US$ 7.83/kg (47 ODP tons)	368,000
TOTAL FUNDING REQUIRED FOR 2004 ACTIVITIES	**1,267,920**
Less amount spent in excess of agreed costs of projects in the first tranche	**(158,800)**
Agreed amount for funding	**1,109,120**

7. Cost Summary

	1st Tranche	2nd Tranche	Total for Plan
Management Cost (US$)	110,000	90,000	200,000
Project Funding (US$)	723,150	1,019,120	1,742,270
TOTAL (US$)	833,150	1,109,120	1,942,270
(i) Overall cost-effectiveness based on eligible consumption of 394 ODP tons (US$/kg)			4.93
(ii) Overall cost-effectiveness based on total consumption of 482 ODP tons to be phased out under the plan (US$/kg)			4.03

8. Administrative Fees for 2004 program

Agency	Amount
UNDP – Foam Manufacturing Sector (7.5%)	US$ 83,184

MEXICO
FOAM SECTOR CFC PHASE-OUT PLAN

REPORT ON THE
FIRST PHASE IMPLEMENTATION WORK PLAN

1. Introduction & Time Period Involved

The 35th meeting of the Executive Committee approved the CFC phaseout program for foams in Mexico with conditions. It:

(a) noted that the Government of Mexico had provided a commitment that implementation of its Foam Sector Phase-out Plan would yield a sustained permanent reduction of 543.4 ODP t (subject to confirmation by the audits indicated below) from Mexico's 2000 national aggregate CFC consumption of 3,059.5 ODP t;

(b) approved in principle the Foam Sector Phase-out Plan and allocated US$ 833,150 including US$ 100,000 as project management funding on condition that UNDP and the Government of Mexico will:

- implement within a period of 18 months an initial phase of the plan for enterprises that should be identified through an audit of their baseline conditions with the objective of phasing out 145 ODP t. In implementing this initial phase, while exercising flexibility, UNDP and the Government should take due care that funding of the enterprises selected is consistent with the policies and guidelines of the Multilateral Fund;

- prepare final audit(s) of the remaining enterprises and on the basis of such audits prepare the final phase of the plan, including incremental costs reflecting fully the amount of US$ 833,150 approved at this meeting in the final plan and taking into account the comments provided, for submission to the Executive Committee not later than its 38th meeting; and request UNDP to communicate to the Secretariat the results of the audits to be conducted and all other relevant information used to determine the eligible costs of the plan; and

- ensure that the total National Annex A Group I consumption in Mexico is permanently reduced to a level no higher than the 2000 national aggregate consumption reported to the Ozone Secretariat from which has been taken the consumption to be phased out from approved but not yet implemented projects (306.8 ODP t) and the phase-out resulting from the foam sector plan.

(c) requested UNDP to report on the status of implementation of this initial phase of the plan at its 38th Meeting.

This report covers the progress made in implementation of the first phase work plan up to mid-October 2003.

2. First Phase Implementation Work Plan – Planned Activities & Achievements

UNDP reported to the 38th Meeting of the Executive Committee that the arrangements for implementation were taking more time than originally expected. UNDP had initially expected to conduct the implementation through UNOPS. However, National Executing Modality was selected instead. This required substantial organizational arrangements that were more time-consuming than originally foreseen.

Due to this, as well as a change in Government and a complete reorganization of SEMARNAT, it took a long time before the project document was signed by all relevant stake holders. It was finally signed in January 2003.

The first tranche of MLF funding of US$ 833,150 was allocated as illustrated in the following Table 1:

Table-1: Budget for First Phase Implementation Work Plan

Activity	**Budget (US$)**
Management and Expert Support Costs	110,000
PU Foam Manufacturing Sector – CFC Conversion Projects - ISF Shoesoles	529,630
- RPF Valcom recipients	193,520
TOTAL	**833,150**

2.1 Management and Expert Support:

Planned Activity: Included the establishment of a Management and Implementation Structure, contracting of experts, preparation of an implementation master plan, preparation of equipment specifications, selection of qualified bidders, conduction of the bidding process, selection of suppliers, and purchase of equipment.

Achievements: A Management and Implementation Structure (MIS) was established with SEMARNAT (overall supervision) the UNDP Country Office (project and procurement management), and national and international experts (to advise the MIS and to conduct technical assistance to the recipients). The MIS is financed through the management component **and** Agency support cost

The MIS prepared implementation action plans, drew up equipment specifications, selected bidders through an open process accessible to any interested potential supplier, conducted bidding for both sub-projects, arranged recipient workshops and placed a purchase order for equipment for the shoesole group. Before the end of the year it will place a purchase order for equipment for the RPF-I group as well.

Table-2 provides an overview of actual management and expert expenses versus the budget:

Table-2: Management and Expert Support Summary Budget Performance, First Tranche:

Activity	***Budget US$***	***Expenditure US$***	***Balance US$***
Local travel	*14,000*	*4,630*	*9,370*
*National consultant**	*36,000*	*8,563*	*27,437*
Subcontract	*20,000*	*0*	*20,000.00*
*International consultant**	*20,000*	*19,572*	*428*
*Workshops/dissemination of information**	*8,000*	*0*	*8,000.00*
Miscellaneous	*2,000*	*0*	*2,000.00*
Contingency	*10,000*	*81*	*9,919*
Total	***110,000***	***32,846***	***77,154***

**there are invoices for work completed pending*

2.2 Implementation of Conversion Project Activities to eliminate CFC Consumption in the Foam Manufacturing Sector:

Planned Activity: prepare final audit of remaining ODS consuming enterprises in the foam sector.

Achievements: UNDP prepared, as part its original submission, a list of 220 potentially eligible enterprises that were identified for inclusion in the Foam Sector Phaseout Plan. The submission was based on an audit covering approximately 40 of these enterprises during which CFC consumption, ownership, export and other eligibility criteria were verified. Based on these audit results, the total amount of CFC-11 remaining in the foam sector (baseline 1999) was projected to be 592 t. This figure was accepted by the ExCom subject, under others, to further, individual verification. This activity has been conducted in the mean time and included this time also other baseline information such as equipment and application details.

Final Audit Activity:

The final audit was designed to gather information on all remaining identifiable CFC-consuming enterprises in the foam sector. Information was collected from the enterprises, as well as from the chemical suppliers, and included CFC consumption, ownership, and exports in addition to baseline equipment and products produced. Commercial refrigeration enterprises that also produced foam were forwarded to SEMARNAT for inclusion in the CRM phaseout plan.

The national consultant started visiting enterprises for the collection of baseline information in the spring of 2002. His work was interrupted due to the delay in project signature (hence, funding for his activities), and was resumed upon signature of the document. The audit activities were completed in the summer of 2003.

The questionnaires were categorized by chemical supplier and forwarded to these for certification. Ineligible enterprises were separated and duplicates were culled from the group, with the following results:

Table-3: Final Audit – Identified Enterprises

Group	Number of Enterprises
Shoesoles	10
ACSA	24
Comsisa	5
Eiffel	45
Pumex	11
Tecnopolimeros	3
Valcom	33
Ineligible	39
Assigned to UNIDO CRM	2
TOTAL	**172**

The CFC consumption of the remaining enterprises (including the enterprises covered under the initial audit) was tabulated, and a confirming certification was requested from each chemical supplier to verify the remaining CFC consumption at the eligible enterprises.

Final Audit, summarized:

The final audit report of the remaining CFC consuming enterprises in Mexico showed the following consumption pattern for 1999 (rounded to nearest tons):

Table-4: Final Audit – System and blowing agent consumption

Group	Certified Systems Consumption (t, 1999)	Validated CFC-11 Consumption (t, 1999)	Validated HCFC-141b Consumption (t, 1999)
Shoesoles	2,933	70	13
ACSA	1,630	163	0
Comsisa	53	4	0
Eiffel	1,642	62	130
Pumex	212	16	0
Tecnopolimeros	79	8	0
Valcom	957	146	0
Subtotal	**7,506**	**469**	**142**
Not certified	105	13	--
*UNIDO-CRM	84	2	8
Total	**15,201**	**484**	**150**

* When identified during the survey as being CRM, companies were immediately deleted. This figure relates to companies deleted in a later stage.

Final Audit compared to Original Audit:

The final audit results were compared to the CFC consumption predicted from the original audit as contained in the Foam Sector ODS phaseout plan, with the following results.

Table-5: Comparison between Initial Audit and Final Audit

	Preliminary Audit	Final Audit	Difference (%)
Systems Consumption	7,804	7,695	(-1.4 %)
Total Blowing Agent Consumption	762	634	(-17 %)
CFC-11 Consumption	592	484	(-18 %)
HCFC-141b Consumption	170	150	(-12 %)

The CFC consumption reported through the final audit is about 18% lower than in the preliminary audit. This is mainly due to lower overall blowing agent content in formulations as originally extrapolated. Other reasons are

- Date of commencement,
- Export
- Non Article-5.1 shareholders
- Lack of certification. In case of five enterprises, no supplier would or could verify consumption. Three of the five self-reported cases amounted to 105 tons of systems consumption, while the other two did not provide any quantitative information
- Fewer enterprises. Originally, 220 enterprises were identified but in the final survey only 171 could be documented (22 % less). Natural evolution (closures and concentration) probably account for most of this
- CRM. While the first survey was not very specific, the second survey very specifically exclude any foam production activities in the Commercial Refrigeration Manufacturing sector

Calculation of Remaining Eligible Consumption for Second Tranche

Based on the initial submission of the foam sector phaseout plan and its targeted reduction of 543.4 ODP tons, the maximum remaining consumption to be phased out in the remaining phase(s) of the Mexico Foam Sector ODS Phaseout Plan would be:

Table-6: Remaining CFC phaseout in the Foam Industry

Agreed reduction from Foam Sector Phaseout Plan	543.4 ODP t
First phase reduction	145.0 ODP t
Remaining ODP phaseout	398.4 ODP t

The ExCom decision stipulated this to be refined based on the results of the final audit undertaken as part of the first phase implementation. The baseline (1999) CFC-11 consumption as determined by the final audit was 484 t. From this amount, corrections must be made for ineligibility, ownership issues, first phase CFC phaseout, etc. Following adjustments apply:

- The CFC scheduled to be phased out in the first tranche 145 t
- CFCs attributable to ineligible enterprises (foundation dates, non-Article 5 ownership) 88 t
- Projects overlapping with the UNIDO RAC project 2 t
- Uncertified consumption 13 t
- Partial non-Article 5 ownership and/or exports to non-Article 5 countries 0.5 t

These results were presented and discussed with the MLF Secretariat, and the following was agreed to regarding remaining consumption to be funded:

Table-7: Eligible CFCs for the Second Phase Foam SPOP

	Tons
1999 CFC-11 consumption	484
Consumption of CFC-11 ineligible for funding	90
Consumption of CFC-11 eligible for funding	394
CFC-11 consumption remaining in 2002	192
Amount of eligible 1999 CFC-11 consumption voluntarily phased out	202
Amount of remaining (2002) CFC-11 consumption funded in first tranche	145
CFC consumption Remainingto be funded	***47***

Classification of remaining eligible enterprises:

The remaining eligible enterprises were categorized by application in order to prepare for the second tranche as follows:

Table-8: Participants in the Second Phase SPOP

Category	**Application**	**Conversion Technology**	**# of enterprises**
Rigid Foam	Spray/Pipe Automotive	HCFC-141b	73
	Panels/ Miscellaneous	HCFC-141b	35
Integral Skin Foam	Miscellaneous	Water	3
TOTAL			**111**

Planned Activity: Complete phase-out activities aimed at phasing out 145 ODP t within 18 months.

Achievements: The implementation of the first phase was delayed due to the project document signature and implementation modality. Authorization was finally received through diligent efforts of UNDP MPU staff and the implementation could go forward from spring 2003. Two groups of enterprises were identified for phaseout activities.

- Shoesole Group – 11 enterprises
- RPF-I ("Valcom") Group – 10 enterprises

Procurement activities were undertaken for the Shoesole group in second quarter 2003. Specifications were prepared, international bidding took place and a workshop was held with the participants to obtain their agreement on the choice of supplier. A purchase order was issued in September 2003. Equipment delivery is expected by December 2003, and project completion can be expected in 2004.

Implementation for the RPF-I Group was initiated in July 2003, with specifications and an implementation plan prepared. Bidding is in process, and will be completed by the end of October 2003. A workshop for the participants is planned for early November 2003 to obtain agreement on choice of supplier so that purchase orders may be issued before year end 2003. Project completion can be expected by late 2004. Following table shows the applicable budget versus actual expenses/commitments:

Table-9: First Phase SPOP - Budget Performance First Tranche (US$):

Activity	***Budget US$***	***Expended/Committed***	***Balance***
Equipment, shoesole group	*490,000*	*415,530*	*74,470*
Equipment, Valcom group	*210,000*	*0*	*210,000*
Contingency	*23,150*	*0*	*23,150*
Total	***723,150***	***415,530***	***307,620***

In summary, ~90% of the funds available for the first phase of this project will have been spent or committed by the end of 2003.

ANNUAL IMPLEMENTATION PROGRAMME

Sector Plan for Phasing out CFC-11 and CFC-12 Production Sector, Mexico (Project code, MEX/PRO/40/INV/115)

1. PROJECT SUMMARY

1.1 Project data

Country;	Mexico
Year of plan;	2004
# of years completed;	1
# of years remaining under the plan;	3
Controlled substances;	Annex A Group I and Annex B Group I
Target ODS production of the preceding year;	Maximum 12,355 metric tonnes
Target ODS production of the year of plan;	Maximum 10,400 metric tonnes
Target ODS aggregate production for the years 2004 and 2005;	Maximum 13,306 metric tonnes
Level of funding requested;	$ 10.7 million
National coordinating agency;	SEMARNAT[1]
International implementing agency;	UNIDO

1.2 Project target

Target:	Maximum 10,400 metric tonnes

Indicators	Preceding year	Year of plan	Total in years 2004 and 2005	Total in years 2003 to 2005
Maximum production, metric tonnes	12,355	10,400	13,306	22,000
Actual production, metric tonnes	8,694	-	-	-

[1] Secretaria de Medio Ambiente y Recursos Naturales

The CFC production in 2003 was 8,694 metric tonnes. As per the Agreement (see Section 2), the aggregate CFC production in 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. Accordingly, the 2005 CFC production in Mexico shall not exceed 6,739 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 40th Meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol in July 2003[2].

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	-	-	-	-	-	-	-	8,694
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 understand that Mexico may not exceed its allowable production limit during any one year.

Through the implementation of the 2003 Annual Program of the Sector Plan for Phasing out CFC-11 and CFC-12 Production Sector (first tranche), Mexico has met its target of maximum CFC production level of 12,355 metric tonnes (MT) in 2003.

In accordance with the Agreement, UNIDO, as the implementing agency, is submitting an Annual Program for the period "1 January - 31 December 2004" for the consideration at the 42nd Meeting of the Executive Committee. This Annual Program has been prepared in cooperation with SEMARNAT.

This document describes the achievements of the 2003 Annual Program by Mexico and details the planned program and activities for 2004. It is being submitted for approval and release of the second tranche of funds amounting to US$ 10.7 million including the enterprise compensation and the technical assistance (TA) component for the implementation of the 2004 Annual Programme.

[2] Decision 40/54 (h), UNEP/Ozl/Pro/ExCom/40/50 Annex V

3. 2003 ANNUAL PROGRAM ACHIEVEMENTS

3.1 CFC Production phase-out and disbursement

CFC production in 2003 amounted to 8,694 metric tonnes, against the maximum allowed production of 12,355 metric tonnes.

The disbursement to a CFC producer, Quimobasicos, in 2003 amounted to US$ 4,998,500, allocated for enterprise compensation.

There was no disbursement to the Government of Mexico in 2003 for the implementation of the TA component. The rest of the grant is going to be used for the TA activities to be organized by the Government with following breakdown; the design of public awareness campaign, $ 47,000; the design of the information collection system of ODSs, $ 14,000; creation of the system to collect data and information of ODSs, $ 130,000; the design of training scheme for Government officials, $ 35,000; the cost for a local expert; $ 50,000.

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

Year	Production Phase-out		Grant Tranche (US$)	
	Target (Metric tonnes)	**Achieved (metric tonnes)**	**Allocation (US$ million)**	**Status of Disbursements**
2003	12,355	8,694 *	5.3	US$ 4,998,500 **

* The independent audit team administrated by UNIDO verified CFC production in 2003 .
** Disbursed to the beneficiary enterprise, Quimobasicos, in November 2003.

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 CICOPLAFEST. The Ministry of Finance through the Customs Office enforces this regulation. Under the system, only the holders of import rights (namely Quimobásicos

and DuPont de México) are allowed to import either the raw material (carbon tetrachloride) for the production of CFCs, or finished CFC products. 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 requested as part of this project to enhance and speed-up the implementation of such regulations and enforcement.

Planned activities

The Government of Mexico plans to establish a set of additional supporting policies and 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 new 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) CFC production quota system

In order to ensure that Mexico's CFC production sector complies with the phase-out schedule targets, the Government will legally formalize a mandatory production quota (or cap) system. The production quota system will be the key policy element for implementing the CFC production sector phase-out plan in Mexico.

The monitoring and enforcement mechanism for the production plan will involve:

(i) Quota system operation and rules is established and documented as an agreement between the Production Sector and SEMARNAT (production quota agreement);

(ii) Mandatory reporting of Production Sector on actual production figures to the National Ozone Unit on a quarterly basis;

(iii) Periodic monitoring visits by SEMARNAT officials of the facilities of CFC Production Sector to check production information and activities;

(iv) Monitoring and supervision of implementation of CFC production phase-out schedule established in the Agreement;

(v) Sanctioning of the production sector in case of failure of reporting, or providing false information; enforcement mechanisms is established on the production quota agreement and/or in any other suitable policy instrument available by SEMARNAT;

(vi) 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.).

b) 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 commercialization of recycled or reprocessed CFCs.

<u>Achievement in 2003</u>

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

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

Regulation for control 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 for the next years the stockpile produced during the period of 2003-2005.

Table 3. Policy measures achievement in 2003

Legislation	**Related Activity**	**Planned timing in project proposal**	**Achievement in 2003**
Production Quota	Introduction of production quota	2003 - 2004	Production Quota was not yet in place. CFC Production was controlled by import Quota 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 2003

Table 4 summarizes achievements and the status of key activities in 2003.

Table 4. Achievements and the status of key TA activities in 2003

Activity item	Planned timing As per Project Document	Achievement and status in 2003
a) Design of public awareness campaign to promote phase-out of CFCs	2003 - 2004	Following activities were determined for the Awareness campaign; preparation of triptics and brochures, and a video production. TOR for design is in preparation. The organization of an event to announce the CFC closure production in Mexico.
b) Design of training for CFC traders in relation to the obligations introduced under the ODS regulations.	2003 - 2004	Started in 2003.
c) Design and conduct market study to fully characterize remnant demand of CFCs in Mexico	2003 -2004	Design of the system started. Implementation is planned in 2004 and years after based on the grant to be provided in later tranches.
d) Prepare consumer sector phase-out plan to submit to MLF for approval of funds necessary for phase-out.	2003 - 2004	CFC phase out project for the aerosol sector was approved at the 41st ExCom. Refrigeration sector CFC phase-out plan (SPP) submitted to the 41st ExCom was deferred, and the national CFC phase out plan (NPP) was prepared based on the SPP and submitted to the 42nd ExCom.
e) Customs training programme to control illegal trade in harmony with RMP	2003 - 2004	The relevant project was included in the NPP submitted to the 42nd ExCom for assistance from the Multilateral Fund.
f) Creation of an information and monitoring system on the production, consumptions imports, exports of CFCs and other ODS including a remote communication system via internet.	2003 - 2004	See item c)
g) 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 2004 based on the second tranche of the grant.

Significant achievement in 2003 is as under.

c) Design and conduct market study to fully characterize remnant demand of CFCs in Mexico: This market study was carried out to have a complete and updated view of CFC market in México. It was the supporting information for preparation of the refrigeration sector CFC phase-out plan submitted to MLF for approval last Executive Committee at its 41st meeting.

d) Prepare consumer sector phase-out plan to submit to MLF for approval of funds necessary for phase-out: The refrigeration sector CFC phase out plan was prepared and submitted to the 41st ExCom.

f) Creation of an information and monitoring system on the production, consumptions imports, exports of CFCs and other ODS including a remote communication system via internet: Preparatory work was carried out. (Detail is given in Section 4).

3.5. Monitoring and reporting activities

The monitoring and reporting mechanism undertaken in 2003 is detailed in Table 5.

Table 5. Monitoring and reporting activities in 2003

Activity	by	Timing	Remarks
Project approval	-	July 2003	40th ExCom
Contract with the enterprise for reporting as well as other obligation	UNIDO Enterprise	November 2003	UNIDO Contract No. 03/191
Progress report to UNIDO based on the contract above	Enterprise	February 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. 2004 ANNUAL PROGRAM: OBJECTIVES AND ACTIVITIES

4.1 ODS Phase-out objectives and disbursement allocation

The objective of the 2004 Annual Program is to ensure that the CFC production does not exceed 10,400 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 second installment of US$ 10.7 million to achieve this objective, which is to be disbursed to the following categories:

- US$ 10.6 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 2004; and
- US$ 0.1 million for implementation of the TA component.

4.2 CFC production phase-out target

The Government of México authorizes a CFC production quota to Quimobásicos, the only CFC producer in México. The production level authorized is no more than 10,400 MT for 2004.

The production quota for 2005 will be determined depending to the production achieved during 2004, and according to the Agreement for production closure and the Montreal Protocol (see Section 1).

Further, the Government of Mexico authorizes the import Quota of CTC to the CFC producing enterprise up to 12,000 metric tonnes in 2004. CTC Consumption rate for CFC-11 is 1.1539 tonnes/ton of product and 1.3116 tonnes/ton of product. Therefore, the enterprise can produce up to 9,149 tonnes of CFC-12 or 10,399 tonnes of CFC-11, if only one of CFCs is produced, and the maximum CFCs production is between 9,149 to 10,399 metric tonnes depending on the ratio of CFC-11 and CFC-12.

Table 6. CFC Production target at the production enterprise

Name of company	**Maximum 2004 annual production, (metric tonnes)**
Quimobasicos	10,400*
Total	10,400*

* With the condition that the maximum aggregate CFC production in 2004 and 2005 lower than 13,306 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 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 of 2004.

Table 7. Policy measures to be carried out in 2004

Legislation	**Related Activity**	**Planned timing in project proposal**	**Plan in 2004**
Production Quota	Introduction of production quota system	2003 - 2004	Introduction of production Quota system and continue to control CFC production by import Quota of CTC
Regulation for control and ban of production and import of CFCs	Enactment	By 2005	Proceeding for the approval by the Parliament

4.4 Technical assistance activities

Proposed technical assistance activities to be undertaken during 2004 are summarized below. These activities have been decided based on the priorities of the Government of Mexico with regard to 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. Also it will registry the gross sales and uses 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:
- elaboration of Terms of Reference of the project.
- design and implementation of the ODS information and monitoring 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 with ODS management (Environmental Federal Attorney, Customs, etc.) to train them in ozone layer protection issues and specifically in detection and identification of ODS.

In the courses, is envisioned the participation of national and international experts. 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 material
- acquisition of infrared identifiers
- organization of training courses and workshops

c) Technical audit, supervision

It is a program of technical audits to Quimobásicos at the end of each year during the period of 2003-2006, to comply with the agreement with the Executive Committee of the Montreal Protocol. Trough this instrument SEMARNAT verifies the quantity of CFC produced in Mexico each year and take the necessary measures to be in 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 audiences on advances of México in Montreal Protocol implementation and the CFC production closure in México.

The major activities are:
- design and development of a mass communication strategy
- design of materials
- special events

e) Local travels

This concept is referred to the local travels for 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 implement the different programs included in this project, development and management of databases for ODS and support the technical audits to the production closure.

Major activities:
- recruitment of national experts

g) Time schedule

The tentative time schedule is given as in Table 8.

Table 8. The tentative time schedule for TA activities in 2004

	Activity	2004, time/month												2005	2006
		J	F	M	A	M	J	J	A	S	O	N	D		
A	ODS Information and Monitoring System														
	Elaboration of Terms of Reference of the project for ODS Information and Monitoring System														
	Send to UNIDO for revision and initiate the bidding process														
	Bidding process and sign 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	Technical assistance and training of relevant ministries and agencies														
	Design of workshops														
	Preparation of workshop														
	Training workshop														
C	Technical Audit supervision														
	audit to a CFC production factory														
D	Development and implementation of a Communication strategy														
	Design of the communication strategy														
	Implementation of the communication strategy														
E	Local travels														
F	General project management														
	Recruitment of a national experts														
	Report														

g) Estimated costs of activities

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

Table 9. Estimated costs of TA activities

	Activity	**2003-2004 US$**	**2005 US$**	**2006 US$**
A	ODS Information and Monitoring System			
	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	173,600	
	Acquisition of Remote communication system via internet to facilitate training activities and linkage with stakeholders involved.	30,000		
B	Technical assistance and training of relevant ministries and agencies			
	Training workshop	37,300	37,300	37,300
C	Technical Audit supervision			
	audit to a CFC production factory	16,000	16,000	16,000
D	Development and implementation of a Communication strategy			
	Implementation of the communication strategy	37,500	8,750	8,750
E	Local travels	12,000	12,000	7,000
F	General project management			
	Recruitment of a national experts	50,000	60,000	60,000
	TOTAL	413,300	307,650	129,050

4.5. Monitoring and reporting activities

The similar steps will be taken for the monitoring and reporting schedule for 2004 as undertaken in 2003. Table blow summarizes the relevant activities.

Table 10. Monitoring and reporting activities in 2004

Activity	by	Timing	Remarks
Approval of Annual programme 2004	-	April 2004	42nd ExCom
Contract with the enterprise for reporting as well as other obligation	UNIDO Enterprise	May – June 2004	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 2005	-
Supervision and regular monitoring	UNIDO SEMARNAT	During 2004	periodically

MEXICO CFC PRODUCTION SECTOR AUDIT REPORT

(FOR 2003)

ESS JAY CONSULTANTS	**SEMARNAT**	**UNIDO**
1. Mr. T.K. Padmanabhan	1. Mr. A. Sanchez-Guevara	1. Mr. T. Grof
2. Mr. V.K. Trehan		2. Ms. M. Latrech
3. Professor Dr. R. S. Aggarwal		3. Mr. R. Oshima

DATE OF SUBMISSION: 09.02.2004
DATE OF REVISION: 27.02.2004

CONTENTS

EXECUTIVE SUMMARY

Technical and Financial Audit of the CFC plant of Cydsa/Quimobasicos Monterrey, Mexico

Prepared for the "Sector Plan for Phasing out of CFC-11 and CFC-12 in the Production Sector (first tranche)". Project number: MEX/PRO/40/INV/115

1. Objective of the audit:

Validation of CFC-11 and CFC-12 production in 2003 at Quimobasicos Factory, Monterrey, Mexico to verify the financial and technical data on the site with the aim of establishing the year 2003 actual production of the enterprise and its conformity with the production closure Agreement, UNEP/Ozl.Pro/ExCom/40/50 Annex V. The Agreement stipulates a maximum production of 12,355 MT in 2003, which will be a part of the total permissible production of 22,000 MT in the years 2003 to 2005.

This verification 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).

2. Composition of the Audit Team:

Mr. T. K. Padmanabhan, Ess Jay Consultants;
Mr. V. K. Trehan, Ess Jay Consultants;
Professor Dr. R. S. Aggarwal, Ess Jay Consultants.

The following personnel from the Government of Mexico and UNIDO accompanied the Audit Team to ensure that the right process was conducted in line with the relevant ExCom Guidelines and the Agreement:

Mr. A. Sanchez-Guevara, Ozone Protection Unit Coordinator, SEMARNAT
Mr. T. Gróf, Deputy to the Director, Multilateral Environmental Agreement Branch, UNIDO
Ms. M. Latrech, Contracts Officer, UNIDO
Mr. R. Oshima, Industrial Development Officer, UNIDO

3. Dates of Audit:

29 and 30 January 2004 (two full days)

4. CFC producing plant :

The Quimobasicos factory in Monterrey has two fluorocarbon production units operating based on the Allied Signal technology. Both plants have a common control room with sophisticated PLC based integrated control systems. Plant 1 was commissioned in 1963 and produces only HCFC-22, and Plant 2 (commissioned in 1983) produces only CFC-11 and CFC-12. Both plants have a swing-over capability, but the swing over operation was not carried out since 1995.

Each CFC product has two day tanks. CFC products are stored in one of the day tanks and are transferred to a main storage tank when the day tank is full.

Various packaging (jugs, bottles and containers) are filled and transferred to the warehouse. The filling system is connected to the recovery facility for recovery of held-up gas in tubes and pipelines. The packaging returned from the costumers are checked, its content is recovered to a separate tank and after its quality control the recovered CFC is added to the product storage tanks.

Major raw materials HF (hydrofluoric acid) and CTC are used for manufacturing of CFC-11 and CFC-12. These raw materials are procured from outside. The materials delivered to the plant are unloaded in raw material tanks. If there is no room in the tank, a cargo is not unloaded but kept waiting. The stock at any given point of time includes stock in fixed tanks and the cargo waiting to be unloaded inside the plant. The raw material storage of HF is common for both plants and flow meters are installed to determine the quantity sent to each of the plants.

5. Overall methodology adopted for audit:

Plant 2 manufacturing CFCs was audited in detail. Plant round was taken for precise understanding of operation and record keeping. The system of measurement for raw material consumption, CFC production and sales was reviewed. The following data were examined:

- Raw material purchase and issue records,
- Production logs and production records,
- Process parameters records,
- Quality control records,
- Stock transfer and sales records,
- Records of import permits of CTC prepared for SEMARNAT.

The methodology and the process adopted for verification are described below.

<u>2003 Opening stock verification:</u>

The closing stock of December 2002 was verified for CFC-11 and CFC-12. The stocks in the plant and warehouse were checked. The financial reports were also checked. With regard to the major raw materials (HF and CTC), December 2002 daily stocks, purchases and consumption were verified to arrive at the opening stock of January 2003.

2003 Raw material verification:

The list of total raw material purchases was taken from the Finance Department and selected pro-forma invoices were crosschecked. The system for raw material consumption accounting was also reviewed. The monthly consumption is calculated as the difference in inventory and purchases during the month. The allocation of raw material consumption for CFC-11 and CFC-12 production 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.

CFC Production verification:

The daily production is recorded by reading the level gauge installed in day tanks for every shift. Daily production is recorded by cumulating such records of all three shifts of the day. 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 filled material transferred from the plant to the warehouse. Any returns from warehouse are subtracted from production. This is the procedure adopted by the plant to compute net production including the filling and handling losses.

There is a difference between CFCs production as recorded in the main storage tank (be treated as gross production) and the amount of CFCs filled into cylinders and other saleable packaging (be treated as net production). The difference between the above is to be accounted as filling losses.

As sample cross checks, four dates were selected on 21 March, 5 April, 1 July and 21 October 2003, which showed high hourly throughput, non operating days, unusual mix of CFC-11 and CFC-12. Verification of process parameters and daily production as well as quality analysis data were carried out for these four days.

Production to packaging transfer:

No stock is maintained in the filling station. Records of filled material in 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. The company uses this figure for calculating the monthly production. A sample review of the system of accounting of filled material was done and found satisfactory.

Sales and Closing Stock:

Actual invoices raised in the month were checked.

6. CFC-11 and CFC-12 production audit summary (January 2003 – December 2003):

The summary of audit is given below.

Parameter	Amount, MT	Remarks
Max. allowable production 2003	12,355	
Actual Production 2003	8,694	
Difference +/-	3,661	(Under produced)
Max. allowable production 2003-2005	22,000	
Max production permitted 2004 -2005	13,306	
Share of 2003 quota utilized	70.37 %	
Share of 2003-2005 quota utilized	39.52 %	
Opening Stock as of 1st January 2003	593	
Other additions	0	
Total opening stock	593	
Gross production	8,693	
Filling & other losses(-)/surplus(+)	1*	
Net production	8,694	
Domestic Sales	967	
Export sales	7,877	
Total sales	8,844	
Closing stock Dec 2003	443	

*Net Surplus due to recovery and cumulative measurement errors.

8. Any unusual occurrences, which have an effect on the CFC production in 2003

No incident reported. No occurrence of major loss of raw material, leakage, strike and major breakdown reported.

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

No CFCs other than CFC-11 and CFC-12 was produced in the plant. Other CFCs (e.g. CFC-113, CFC-114, CFC-115) were imported mainly to cater to the domestic demand.

10. Major modifications and equipment change in Plant 2:

Neither major modification of the factory nor change of equipment was carried out in the year 2003.

11. Conclusions:

1. Both plants are in good condition and are well maintained. The production is monitored on net basis, i.e., losses are not separately measured.

2. The enterprise has a good recovery system in the filling station to minimize CFC-12 filling losses. It may be noted that the Plant has an excellent recovery system of residual gases in the filling pipeline and returned packages for refilling. Such gases, which are sucked back, are accounted as part of production.

3. Quimobasicos has produced 8,694 MT of CFC-11 and CFC-12 against the 2003 quota of 12,355 MT. This represents a quota utilisation of 70.36 % for the year 2003.

4. The plant has also committed to a total maximum production of 22,000 MT in the period 2003-2005. Against this commitment, their 2003 production is 39.51 %. They have a provision to produce 13,306 MT in the years 2004-2005 within the maximum allowable yearly production limits given in the Agreement.

5. The closing stock verified at the end of December 2003 is 443 MT, which is the opening stock for 2004.

6. Based on the data supplied by the enterprise and random checks, the verification team confirmed the monthly and annual production and sales data.

7. Data of Plant 1 producing HCFC-22 was also investigated. The HF consumption balance was verified for both plants as they have a common storage for this raw material.

EXECUTIVE COMMITTEE

FORMATS

The ExCom formats are given below in line with ExCom Guideline 32/33 Dated 24. 10. 2000 (Sheets F1, 2, 3 and 4) with the following clarifications:

F1 Data of Plant location, respondents etc.

F2 The combined capacity of both the plants, in CFC terms is 23,652 MTA. Both plants have equal capacity in CFC terms.

1. Data indicated in this sheet for CFC-11 and CFC-12 from 1995 onwards, is from Plant 2 as there has been no swing over in either of the two plants.

2. HF in house production was discontinued from December 2001, CTC was always purchased.

3. The enterprise has increased their production in 2003 by around 54 % over the year 2002. (2003 production: 8,693MT; 2002 production: 5,651 MT).

F3 Loss/Surplus is attributed to measurement error as explained in the detailed portion of the audit.

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

2. The increase in production in 2003 has come from a significant increase in the number of operating days. The plant has been operated at 28 TPD in 2003 against a nominal capacity of 36 TPD (11,826 TPA/330 days)

F4 The Total consumption of CTC in the year 2003 as verified was 11,201 MT.

1. The total consumption of HF in the year 2003 as verified was 5,931 MT.

2. Raw Material Consumption ratio

	CFC-11	CFC-12
Carbon tetrachloride (tones/ ton of product)	1.1539	1.3116
Hydrogen fluoride (tones/ton of product)	0.1661	0.3772

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

3. In the month of December 2003, the CTC norms are less than the theoretical norms. The plant personnel indicated that this was probably due to an error in measurement of inventory over the months.

F1 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:	
Sector plant number:	
SRI # :	
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	T K Padmanabhan Vibhash Kumar Trehan
Accompanied by	
SEMARNAT	Agustin Sanchez -Guevara, Ozone Protection Unit Coordinator
UNIDO	Dr. Tamas Grof Deputy Director-Montreal Protocol Branch Ms. Mounira Latrech - Contracts Officer Dr. Ryuichi Oshima - Industrial Development Officer
Date of plant visit:	29th and 30th Jan 2004
Duration of visit:	Two days

F2 Questionnaire for ODS production Phase Out Verification (Including Gradual Closure)

A. Plant History

Date of construction: Line 1 = 1963, Line 2 = 1983

			Production									
ODS Products	No of lines	Capacity in baseline year	Baseline year (aver. 95-97)	1995	1996	1997	1998	1999	2000	2001	2002	2003
CFC-11	2 (1)	23,652	2,586	2,411	3,051	2,297	1,020	1,225	1,307	851	757	1,291
CFC-12	2 (1)	23,652	7,714	9,473	7,156	6,513	4,658	4,305	6,238	5,790	4,894	7,402
CFC-12/11			10,300	11,884	10,207	8,810	5,678	5,530	7,545	6,641	5,651	8,693
CFC-13												
CFC-113												
CFC-114/115												
Raw material production												
HF (2)	1 (3)		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 on December 2001.

CFC-11	Baseline year (aver. 95-97)	1995	1996	1997	1998	1999	2000 [2]	2001	2002	2003
Quota [1]	11,232	None	None	None	None	None	Combined quota for CFC11 &CFC 12 for 2003 is 12,355 MT			
Opening stock at beginning of year		143	164	142	78	157	212	175	175	322
Production	2,586	2,411	3,051	2,297	1,020	1,225	1,307	851	757	1,291
Purchases					167				-	-
Sales	2,604	2,397	3,068	2,349	1,100	1,173	1,342	838	603	1,534
(Loss)Surplus		(7)	5	13	7	(3)	3	(13)	(7)	3
Closing stock at end of year		164	142	78	157	212	175	175	322	82

CFC-12	Baseline year (aver. 95-97)	1995	1996	1997	1998	1999	2000 [2]	2001	2002	2003
Quota [1]	11,232	None	None	None	None	None	Combined quota for CFC11 &CFC12 for 2003 is 12,355 MT			
Opening stock at beginning of year		751	236	398	212	1,095	273	405	316	271
Production	7,714	9,473	7,156	6,513	4,659	4,305	6,238	5,790	4,894	7,402
Purchases					668					
Sales	7,880	9,983	6,994	6,663	4,426	5,134	6,105	5,860	4,918	7,310
(Loss)Surplus		5	(0)	36	18	(7)	1	(19)	(21)	(1)
Closing stock at end of year		236	398	212	1,095	273	405	316	271	361

Annual HF/CFC ad CTC/CFC ratios (factores de consumo anulizado)

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

Operational days per year

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

F4 Questionnaire for ODS production Phase Out Verification (Including Gradual Closure)

Monthly CFC-11/12 production and raw material consumption.

CFC production and CTC consumption:

Month	No of operating days	CFC-11 Production	CTC/CFC-11 ratio	CTC opening stock	CTC procured/or added to stock	CTC closing stock
Jan-03	18.0	26	1.169	371	799	548
Feb-03	24.0	112	1.147	548	444	217
Mar-03	28.0	164	1.176	217	1,064	368
Apr-03	30.0	156	1.154	368	929	206
May-03	31.0	109	1.155	206	1,134	119
Jun-03	30.0	132	1.157	119	1,116	124
Jul-03	31.0	140	1.155	124	1,264	228
Aug-03	30.0	124	1.146	228	1,133	184
Sep-03	30.0	103	1.159	184	1,069	287
Oct-03	15.0	30	1.197	287	723	470
Nov-03	30.0	123	1.138	470	872	320
Dec-03	15.0	72	1.116	320	311	27
					10,857	

Month	No of operating days	CFC-12 Production	CTC/CFC-12 ratio	CTC opening stock	CTC procured/or added to stock	CTC closing stock
Jan-03	18.0	445	1.328	371	799	548
Feb-03	24.0	496	1.303	548	444	217
Mar-03	28.0	538	1.336	217	1,064	368
Apr-03	30.0	695	1.311	368	929	206
May-03	31.0	835	1.312	206	1,134	119
Jun-03	30.0	729	1.314	119	1,116	124
Jul-03	31.0	760	1.311	124	1,264	228
Aug-03	30.0	795	1.302	228	1,133	184
Sep-03	30.0	642	1.317	184	1,069	287
Oct-03	15.0	372	1.360	287	723	470
Nov-03	30.0	682	1.293	470	872	320
Dec-03	15.0	414	1.268	320	311	**27**

CFC production and HF consumption:

Month	No of operating days	CFC-11 Production	HF/CFC-11 ratio	HF opening stock	HF procured/ or added to stock	HF closing stock
Jan-03	18.0	26	0.163	**8**	365	93
Feb-03	24.0	112	0.173	93	437	198
Mar-03	28.0	164	0.165	198	291	33
Apr-03	30.0	156	0.165	33	662	82
May-03	31.0	109	0.166	82	661	93
Jun-03	30.0	132	0.166	93	664	170
Jul-03	31.0	140	0.164	170	440	115
Aug-03	30.0	124	0.165	115	585	37
Sep-03	30.0	103	0.167	37	659	115
Oct-03	15.0	30	0.169	115	436	80
Nov-03	30.0	123	0.167	80	511	145
Dec-03	15.0	72	0.164	145	219	**9**
					5,930	

Month	No of operating days	CFC-12 Production	HF/CFC-12 ratio	HF opening stock	HF procured/ or added to stock	HF closing stock
Jan-03	18.0	445	0.372	8	365	93
Feb-03	24.0	496	0.392	93	437	198
Mar-03	28.0	538	0.371	198	291	33
Apr-03	30.0	695	0.375	33	662	82
May-03	31.0	835	0.378	82	661	93
Jun-03	30.0	729	0.377	93	664	170
Jul-03	31.0	760	0.373	170	440	115
Aug-03	30.0	795	0.372	115	585	37
Sep-03	30.0	642	0.381	37	659	115
Oct-03	15.0	372	0.388	115	436	80
Nov-03	30.0	682	0.379	80	511	145
Dec-03	15.0	414	0.374	145	219	9

Month	No of operating days	HCFC-22 Production	HF/HCFC-22 ratio	HF opening stock	HF procured/ or added to stock	HF closing stock
Jan-03	11.0	197	0.562	8.00	365	93
Feb-03	12.0	229	0.518	93	437	198
Mar-03	20.0	389	0.591	198	291	33
Apr-03	30.0	572	0.569	33	662	82
May-03	31.0	548	0.579	82	661	93
Jun-03	30.0	500	0.581	93	664	170
Jul-03	19.0	322	0.584	170	440	115
Aug-03	29.0	611	0.567	115	585	37
Sep-03	28.0	573	0.559	37	659	115
Oct-03	30.0	564	0.571	115	436	80
Nov-03	15.0	290	0.576	80	511	145
Dec-03	17.0	323	0.586	145	219	9

DETAILED REPORT ON THE AUDIT

Detailed description of the methodology applied for the audit supported with photocopies of records taken from the plant

General view

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 purchases, opening and closing stock at the enterprise level. The overall method of record keeping is found satisfactory.

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 CFC-11/CFC-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 (Plant 1) operates solely on HCFC-22 and the new plant (Plant 2) 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 each plant in one mode only. Furthermore, the demand has not justified the need for swing-over. The Plant 2, which was operating on CFC-11/CFC-12 in 2003, has produced 8,693 MT. This is about 74% of capacity utilization of this plant (8,693/11,826).

The plant is ISO 9001 and ISO 14001 certified. Both plants are very well maintained. CFCs are co-produced from CTC and HF from a single reactor. The ratio of CFC-11 and CFC-12 can be varied as per requirement of production. The enterprise has taken trial for production of CFC-12 only, by recycling back CFC-11 in the year 2003 and tried to establish the effect on equipment life. Final conclusions are not yet drawn.

The raw material storage of HF (Hydrofluoric Acid) is common for both the plants. However, flow meters are installed to know the quantity sent to each plant. HF handling is also done in the enclosed chamber. HF sensors are installed at various points for giving pre-warning signal of any leakage and 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:

1. 2003 Opening stock verification:

The closing stock of December 2002 was verified for CFC-11 and CFC-12. The stocks in the plant and warehouse were checked. The financial reports were also checked. Of major raw materials HF and CTC the stock, purchases and consumption

was verified to arrive at the opening stock of January 2003. The financial records verified for CFC-11 and CFC-12 for the month of December 2002 is enclosed as **Annexure 1A** & **Annexure 1B**. Based on these financial records and verification of raw material purchases, issues and inventory, the following are the accepted stock values in tons.

Opening Stock of raw material CTC in Jan. 2003	=	371 MT
Opening Stock of raw material HF in Jan. 2003	=	8.2 MT
Opening Inventory of CFC-11 in Jan.2003	=	321.8 MT
Opening Inventory of CFC-12 in Jan.2003	=	270.8 MT

2. 2003 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 the 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 fixed tanks and the cargo waiting to be unloaded inside the plant. The list of total raw material purchase was taken from the finance department and selected pro-forma invoices were cross-checked. The system for raw material consumption accounting was also reviewed. 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 and 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 RM accounting report for the entire year is enclosed as **Annexure 2A** and **Annexure 2B.**

Total Purchase of CTC in the year 2003	= 10,855 MT
Total Purchase of HF in the year 2003	= 5,931 MT

3. CFC Production verification:

The daily production is recorded by reading the level gauge installed in day tanks. The day tanks have level measurement facility and with the help of a pre-calibrated level to weight chart of each tank, production is calculated for every shift. Daily production is recorded by cumulating such records of all three shifts of the day. Each product has two day tanks and before transferring to the main tank, quality is approved by quality lab. Daily production is recorded only for internal purpose. 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 filled material transferred from plant to warehouse. Any returns from warehouse are subtracted from production. This is the procedure adopted by the plant to compute net production including the filling and handling losses. The enterprise has a good recovery system in the filling station for CFC-12 and HCFC-22, which ensures losses of only insignificant quantity.

Though the audit demands only net production accounting, for the purpose of accurate accounting, it is suggested that both gross and net production be recorded on

a daily basis. There is the difference between CFCs production as recorded in the main storage tank (be treated as gross production) and CFCs filled into cylinders and other saleable packaging (be treated as net production). The difference between the above is to be accounted as filling losses. As sample cross checks, few dates showing high hourly throughput, non operating days, unusual mix of CFC-11 and CFC-12[1] were selected and verification of process parameters, daily production, quality analysis data were carried out and found satisfactory. Sample sheets of production logbook, quality records are included as **Annexure 3A and Annexure 3B.**

The raw material consumption norms for HF and CTC were verified and found to be consistent in 2003 over the months and in comparison to the past years.

Raw Material Consumption ratio

	CFC-11	CFC-12
Carbon tetrachloride (tones / ton of product)	1.1539	1.3116
Hydrogen fluoride (tones / ton of product)	0.1661	0.3772

The norms are comparable to good plants in the world. The trends of production vs. CTC and HF consumption over the months in 2003 is shown in **Annexure 3C.**

4. Production to packaging transfer:

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

Jugs - 15 lbs, 30 lbs & 50 lbs
Bottles 340gms, 1kg

The recycled packaging materials are cylinders, tonners and ISO container for filling large 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 production. A sample review of the system of accounting of filled material was done and found quite satisfactory. Two samples from the filled material were taken, one of CFC-12 and the other of HCFC-22. The pressure, weight and gas chromatography (GC) analysis was done and found satisfactory. The copy of the GC analysis is enclosed as **Annexure 4A.**

[1] 21 March, 5 April, 1 July and 21 October 2003

5. 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**. Verification was done by randomly selecting invoices and verifying their accounting in monthly sales. Closing Stock of raw materials and finished goods are computed and verified based on data given in **Annexure 6** and **F3.**

Closing Stock of raw material CTC in Dec 2003	=	27 MT
Closing Stock of raw material HF in Dec 2003	=	93 MT
Closing Inventory of CFC-11 in Dec 2003	=	82MT
Closing Inventory of CFC-12 in Dec 2003	=	361 MT

6. Guidelines

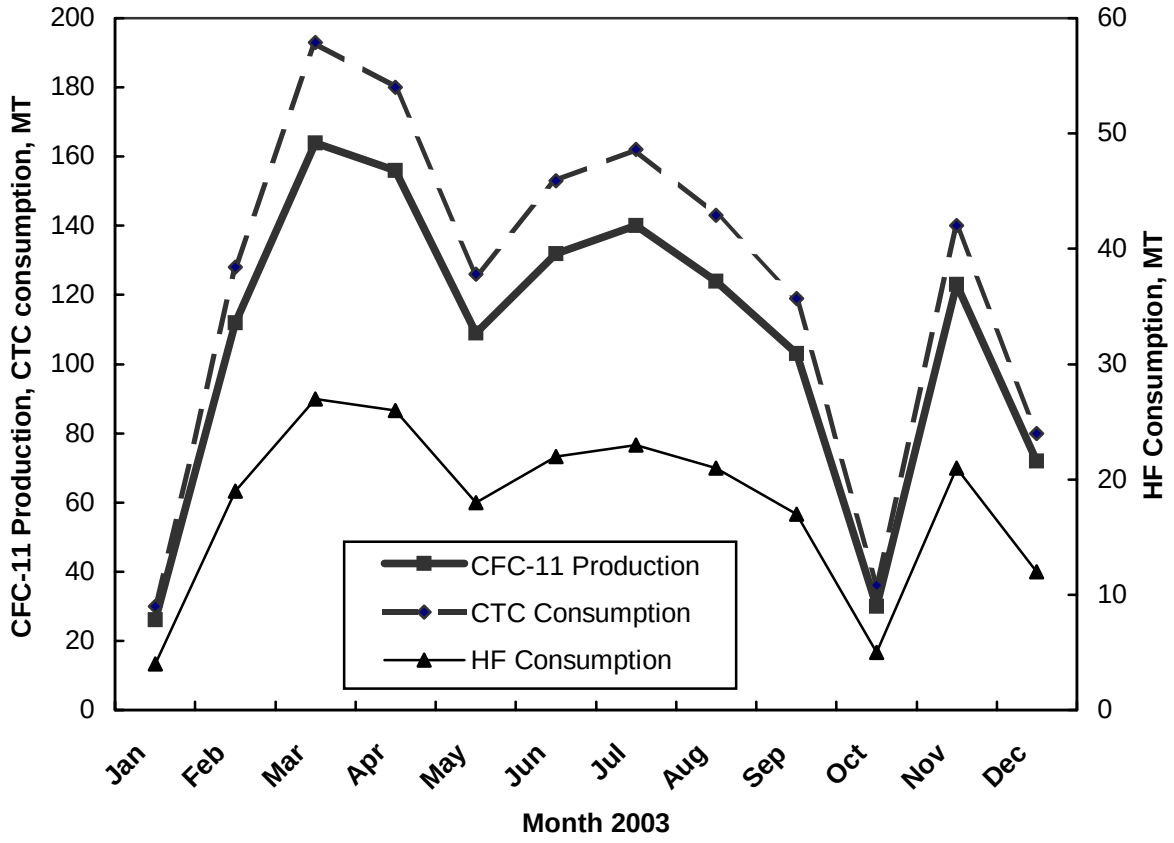
Annexure 7 shows the check list of the audit process with the guidelines, steps to be included and steps taken out of the guidelines.

ANNEXURES

ANNEXURE 3C

CFC-11 Production and CTC/HF consumption in 2003, MT

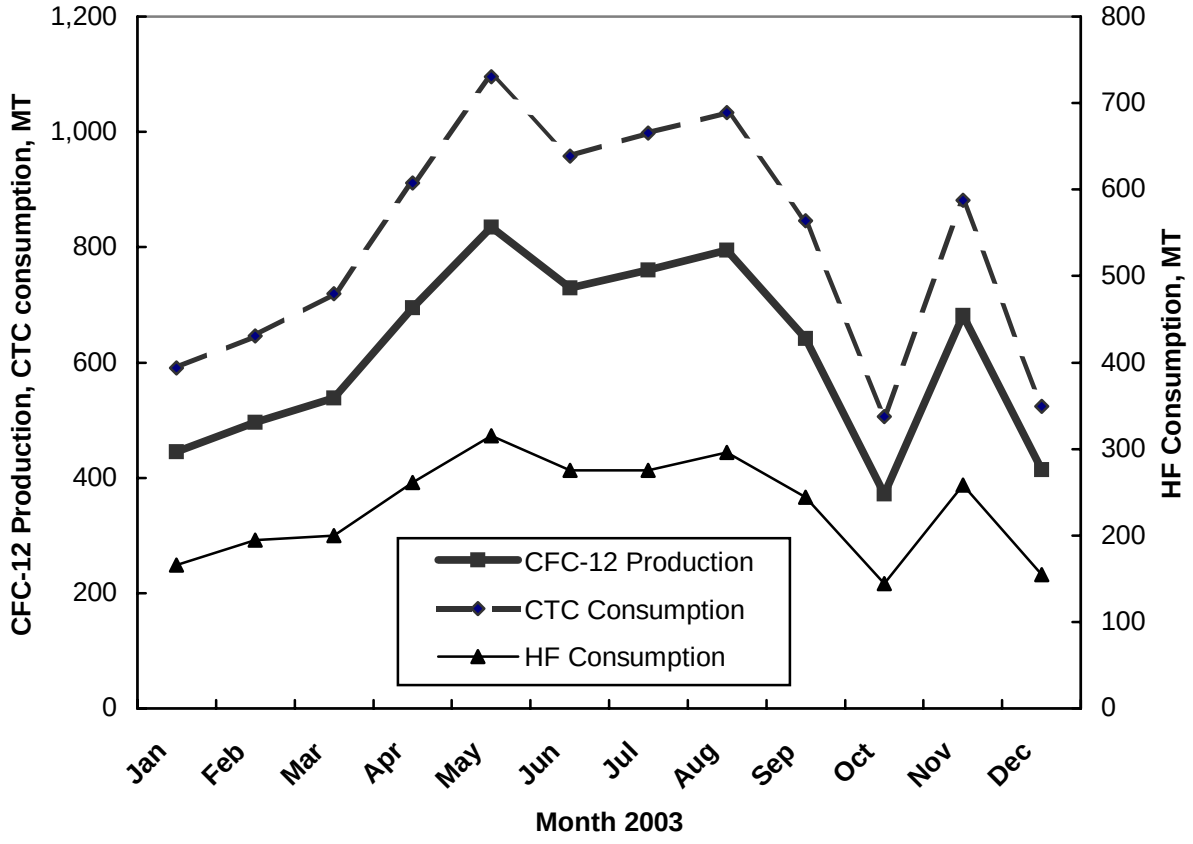
Month	CFC-11 Production	CTC consumption	HF Consumption
Jan	26	30	4
Feb	112	128	19
Mar	164	193	27
Apr	156	180	26
May	109	126	18
Jun	132	153	22
Jul	140	162	23
Aug	124	143	21
Sep	103	119	17
Oct	30	36	5
Nov	123	140	21
Dec	72	80	12
Total	**1,291**	**1,490**	**215**



ANNEXURE 3C (continued)

CFC-12 Production and CTC/HF consumption in 2003, MT

Month	Production	CTC consumption	HF consumption
Jan	445	591	166
Feb	496	646	195
Mar	538	719	200
Apr	695	911	261
May	835	1096	315
June	729	958	275
July	760	998	284
Aug	795	1034	296
Sep	642	846	244
Oct	372	506	144
Nov	682	881	258
Dec	414	524	155
Total	**7,402**	**9,711**	**2,792**



Annexure 7. Check list of the audit process with the Guideline

Sl.	Verification steps	Check by Ess Jay	Ess Jay observation
1	Confirm production and raw material consumption from production logs	Done	Production logs used for internal records
2	Verify sales and procurement of ODS products against financial records	Done	Sample verification done
3	Verify stock at the beginning and the end of year against financial records	Done	Found satisfactory

STEPS TO BE INCLUDED

Sl.	Verification steps	Check by Ess Jay	Ess Jay observation
1	Review system of record for adequacy	Done	Monthly record keeping is satisfactory. Checked monthly filling, production and raw material consumption records
2	Observe plant condition and apparent operational status	Done	Well maintained plant. Housekeeping is good, no outside corrosion observed, no leakage observed. Visual display good. Equipment condition good.
3	Audit daily production records and key feedstock consumption data	Done	Daily production logs for internal purpose.
4	Confirm monthly and annual production production = sales - change in inventory	Done	Matches. Verified the monthly filling, inventory change in day and main tank and confirmed monthly and annual production.
5	Confirm cumulative inventory change of ODS product corresponds to annual production	Done	Satisfactory. Verified on monthly basis and integrated for annual basis
6	Confirm cumulative inventory change of key raw material is consistent with production both overall and per campaign	Done	Very Consistent. The raw material consumption norms are consistent overall .
7	Integrate hourly in-plant flow rate data over time to get an independent value for production	Done	See detailed audit report.(Detail report Item 3)
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	See detailed audit report (Detail report Item 3)
9	On a spot basis, rationalize hourly plant logs with raw material consumption and production.	Done	System not in place. Logs are used only for internal purpose however declared production derived from filled material and inventory change.
10	Review logs for periods of high hourly throughput and compare to reported production. Investigate any possible inconsistency	Done	Found satisfactory. Sample reports were compared
11	Review hourly plant logs during non-campaign time periods to verify non-production	Done	Found satisfactory. Checked inventory, production and Quality records.

STEPS TAKEN OUT OF GUIDELINE

12	Sampling for analysis	Done	Purity, Product verification, satisfactory