



联合国



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执行蒙特利尔议定书
多边基金执行委员会
第四十二次会议
2004年3月29日至4月2日，蒙特利尔

项目提案：墨西哥

本文件载有基金秘书处对以下项目提案的评论和建议：

泡沫塑料

- 泡沫塑料行业的 CFC 淘汰计划(第二期) 开发计划署

熏蒸剂

- 对于落实 2005 年淘汰 20%甲基溴的技术援助 加拿大/西班牙/
工发组织

淘汰

- 国家 CFC 淘汰计划(第一期) 工发组织

生产

- 2003 年 CFC 生产行业审计报告以及淘汰 CFC-11 和 CFC-12 生产行业的行业计划：2004 年度执行方案 工发组织

项目评价表

墨西哥

行业： 泡沫塑料

行业消耗臭氧层物质使用量(2002 年):

192 ODP 吨

次级行业成本效益临界值:

不适用

项目名称:

(a) 泡沫塑料行业的 CFC 淘汰计划(第二期)

项目数据	多重	
	国家计划	
企业消费量 (ODP 吨)		484.0
项目影响 (ODP 吨)		339.0
项目期限 (月)		24
申请的初始金额 (美元)		1 109 120
最终项目费用 (美元):		
增加基本建设费用 (a)		
应急费用 (b)		
增加经营费用 (c)		
项目总费用 (a+b+c)		1 109 120
当地所有权 (%)		100
出口部分 (%)		0
第二期申请的金额 (美元)		1 109 120
成本效益 (美元/公斤)		3.27
对应方供资是否确认?		
国家协调机构	环境部(SEMARNAT)	
执行机构	开发计划署	
秘书处的建议		
建议金额(美元)		1 109 120
项目影响(ODP 吨)		339.0
成本效益(美元/公斤)		3.27
执行机构支助费用(美元)		83 184
向多边基金申请的总费用(美元)		1 192 304

项目说明

1. 开发计划署代表墨西哥政府向第四十二次会议提交了一项请求：即为执行委员会第三十五次会议上原则上批准的墨西哥泡沫塑料行业计划的第二期也是最后一期(2004-2005 年度执行方案)划拨 1 109 120 美元外加 83 184 美元的支助费用。本文件包括：

- 第一阶段执行工作计划的报告(2002-2003 年)；和
- 第二阶段执行工作计划。

背景资料

2. 该项目最初于 2000 年 3 月提交给执行委员会第三十次会议。由于某些数据不符和政策问题上的困难，第三十次会议推迟核准该项目，随后第三十二和第三十三次会议也都推迟了核准。在第三十五次会议上，开发计划署提交了该行业淘汰计划的修订提案，以在四年内以 3 622 850 美元的总费用淘汰约 534 ODP 吨。执行委员会在其第 35/47 号决定中原则上核准了泡沫塑料行业计划，最初拨款 843 150 美元，其中包括管理费 100 000 美元，用以逐步停止已经确定的 145 ODP 吨 CFC 消费，并请开发计划署在第三十八次会议上报告该计划的执行情况。所附的进度报告“关于第一阶段执行工作计划的报告”中转载了第 35/47 号决定。开发计划署向第三十八次会议提交了报告，指出由于某些机构方面的困难，该项目的执行推迟了。因此，自硬质连皮泡沫次级行业中的其余，主要是中小型泡沫塑料生产企业的 CFC 淘汰项目首次提交给执行委员会以来，已经过去四年了。

进度报告

审计 CFC 和计算泡沫塑料行业剩余的合格消费

3. 开发计划署和墨西哥政府在第一阶段期间的主要任务之一是审计其余企业的消费情况，以便弄清它们是否有资格领取经费及其使用 CFC 的情况。所附进度报告说明审计结果。期末审计确认 1999 年泡沫塑料行业总共消费了 634 吨发泡剂，而不是先前预测的 792 吨，其中包括 484 吨 CFC-11(而不是 592 吨)和 150 吨 HCFC-141b(而不是 170 吨)。当考虑到已确定的墨西哥泡沫塑料行业中无资格领取资金的企业的消费量之后，根据 1999 年的消费量计算，有资格领取资金的剩余 CFC 消费量为 394 ODP 吨。这构成了确定淘汰泡沫塑料行业剩余 CFC 的资金的的基础。

泡沫塑料行业计划第一阶段的执行情况

4. 第三十五次会议上核准的、作为开发计划署落实 145 ODP 吨淘汰工作和对其余企业进

行期末审计预付款的 843 150 美元包括投资方案 723 150 美元和管理费用 100 000 美元。项目费用是根据每个次级行业的单位成本计算出来的。开发计划署的进度报告指出，此项工作是从 11 个鞋底(连皮泡沫塑料)和 10 个硬质泡沫塑料生产企业开始的，这两类消费了 145 ODP 吨 CFC。该报告还指出，这已经超过了基于每个行业商定的单位成本计算的金额，因此，支出或承付了已核准的总额 723 150 美元，作为该行业的一种预付款。

墨西哥泡沫塑料行业计划第二阶段的执行方案

5. 所附的年度执行方案中介绍了具体目标和活动，包括政府行动和预期费用。

CFC-11 的消费情况

6. 审计结果显示，无资格领经费的企业在总共 484 ODP 吨 CFC-11 中消费了 90 ODP 吨。因此，其余的合格消费量计算为 394 ODP 吨。墨西哥报告 2002 年泡沫塑料行业消费了 192 ODP 吨。这表明通过某些企业的自愿行动已消除了 202 ODP 吨。此外，在 2002 年消费的 192 ODP 吨中，145 ODP 吨是由第一阶段执行方案中的企业消费的，47 ODP 吨 CFC-11 消费量由仍在将 CFC-11 用作吹泡剂的无资助企业消费。因此，要求提供资金以满足自愿淘汰 202 ODP 吨 CFC-11 的需要，其余的 47 ODP 吨主要归于小型硬质泡沫塑料企业。

项目费用的计算

7. 根据上述对泡沫塑料行业 CFC 消费情况的分析，淘汰泡沫塑料行业剩余 CFC 的费用计算如下：

	美元
为援助在原则上批准了根据第一阶段企业的可比成本效益值制订的计划之后已经停止使用 CFC 的企业而需要的供资(3.96 美元/公斤，202 ODP 吨)	799 920
按 7.83 美元/公斤为淘汰硬质泡沫塑料中小型企业剩余的 CFC 消费量(47 ODP 吨)供资	368 000
管理费用	100 000
减：超过第一期商定费用的支出经费	(158 800)
总计	1 109 120
支助费用	83 184
向多边基金申请的总费用	1 192 304
成本效益(基于 339 ODP 吨的项目影响)	3.27 美元/公斤

泡沫塑料行业计划的费用汇总

8. 分为两期执行的墨西哥泡沫塑料行业计划的总费用如下表所示。

	第一期	第二期	计划总计
管理费用(美元)	110 000	90 000	200 000
项目资金(美元)	723 150	1 019 120	1 742 270
总计(美元)	833 150	1 109 120	1 942 270
(一) 按有资格得到资金的消费量 394 ODP 吨计算的总成本效益(美元/公斤)			4.93
(二) 按总消费量 484 ODP 吨计算的总成本效益			4.02

秘书处的评论和建议

评论

9. 秘书处和开发计划署讨论了执行该项目中的延迟所引发的问题。开发计划署指出，已经解决了先前影响该行业计划执行的机构问题。因此，将来执行方面不可能出现延迟。

10. 批准和执行过程中遇到的延迟似乎也导致了某些企业自愿改用替代发泡剂，这些企业可能仍然需要一些资金以整修或尽可能改换设备，以使其水平与竞争者不相上下。

11. 墨西哥泡沫塑料行业计划现在分两期供资，而不像最初计划的那样分四期供资。该计划的总费用 1 942 270 美元(成本效益值为 4.93 美元/公斤)，是提交给第三十五次会议的计划的原定费用的 54%。

12. 墨西哥向臭氧层秘书处报告 2001 年和 2002 年附件 A 第一类物质的总消费量分别为 2 223.9 ODP 吨和 1 946.7 ODP 吨，而 2000 年的消费量为 3 059.5 ODP 吨。因此，墨西哥按照第 35/4 号决定(b) (三)段的要求将其附件 A 第一类物质的消费量永远减至不高于 2000 年全国消费总量的水平上。

13. 墨西哥泡沫塑料行业计划与近期计划不同，不受墨西哥与执行委员会之间的协定管制。但是，为了便利监测该项目，执行委员会似宜请开发计划署就执行该计划的进展情况编写年度报告。

建议

14. 基金秘书处建议按照下表所示的供资额和相关的机构支助费用，一揽子核准墨西哥泡沫塑料行业 CFC 淘汰计划的第二阶段执行工作计划。

	项目名称	项目资金 (美元)	支助费用 (美元)	执行机构
(a)	泡沫塑料行业的 CFC 淘汰计划(第二期)	1 109 120	83 184	开发计划署

15. 基金秘书处进一步建议，执行委员会请求开发计划署每年在当年的第一次会议上提出墨西哥泡沫塑料行业淘汰计划执行情况的进度报告，直到预计在 2006 年结束的该计划结束

为止。

项目评价表

墨西哥

行业： 熏蒸剂 行业消耗臭氧层物质使用量(2002年)： 1 067 ODP 吨
次级行业成本效益临界值： 不适用

项目名称：

(a) 对于落实 2005 年淘汰 20%甲基溴的技术援助

项目数据	熏蒸剂		
企业消费量 (ODS 吨)			
项目影响 (ODS 吨)	18.2	107.2	36.9
项目期限 (月)	18	18	18
申请的初始金额 (美元)	224 070	707 965	528 862
最终项目费用 (美元)：			
增加基本建设费用 (a)	190 000	707 965	207 035
应急费用 (b)			
增加经营费用 (c)			
项目总费用 (a+b+c)	190 000	707 965	207 035
当地所有权 (%)	100%	100%	100%
出口部分 (%)	0%	0%	0%
申请的金额 (美元)	190 000	707 965	207 035
成本效益 (美元/公斤)*			
对应方供资是否确认?	不适用	不适用	不适用
国家协调机构		环境部(SEMARNAT)	
执行机构	加拿大	西班牙	工发组织
项目总额	1 105 000 美元		

秘书处的建议			
建议金额 (美元)			
项目影响 (ODP 吨)			
成本效益 (美元/公斤)*			
执行机构支助费用 (美元)			
向多边资金申请的总费用 (美元)			

* 整个项目的平均成本效益值为 6.80 美元/公斤。

项目说明

16. 墨西哥政府曾提交一份国家甲基溴淘汰计划，供执行委员会第四十一次会议审议，同时仅为了将其甲基溴消费量减少 318.8 ODP 吨(甲基溴履约基准的 28.2%)而请求援助。应墨西哥政府的请求，该项目已撤回。

17. 墨西哥政府重新提交本提案，作为落实到 2005 年墨西哥淘汰 20%甲基溴基准消费量(淘汰 162.4 ODP 吨)的技术援助方案。该项目将在加拿大和西班牙两国政府(通过双边合作)以及工发组织(土壤熏蒸行业的牵头执行机构)援助下执行。

甲基溴使用情况

18. 2000、2001 和 2002 年，墨西哥的甲基溴消费总量分别为 867 ODP 吨、1 100 ODP 吨和 1 067 ODP 吨。甲基溴的履约基准为 1 130.8 ODP 吨。

19. 甲基溴用于下列作物的土壤或培养基的熏蒸：

作物	总面积(公顷)	使用甲基溴的面积	甲基溴(ODP 吨)	农民人数
草莓	630	916	187.9	15
西红柿	12 569	1 393	315.8	179
智利喇叭花	3 972	489	116.3	66
瓜	1 120	588	88.2	98
浆果	378	265	52.7	83
烟草		126	17.8	1
大蒜	240	185	40.5	28
其他	262	238	53.3	78
花卉	347	347	74.7	133
总计	19 518	4 547	947.2	681

20. 另外，大约 1 200 名熏蒸员还用甲基溴熏蒸以下商品和建筑物，以防治各种害虫：

用途	甲基溴 (ODP 吨)
装谷物和其他贮存物的仓库和地窖	58.8
面粉厂、食品厂	38.4
木材(非检疫和装运前消毒处理)	4.8
博物馆、历史建筑	3.0
卡车、有轨车、轮船、飞机	7.8
其他(干辣椒、香料、干果、坚果、烟草产品)	7.0
总计	119.8

21. 墨西哥报告用于检疫和装运前消毒处理的甲基溴消费量为：2000 年 359 ODP 吨；2001 年 715 ODP 吨；2002 年 155 ODP 吨。

22. 目前，甲基溴的所有进口商都在部委间杀虫剂、肥料和有毒物质加工和使用管制委员会注册。所有进口许可证都须经该委员会批准，而该委员会又须经环境和自然资源部批准。

示范项目

23. 执行委员会迄今核准了墨西哥的两个甲基溴示范项目：

- (a) 西红柿、草莓、烟草、瓜和切花种植中使用甲基溴的替代办法 (第二十五次会议, 总费用为 790 350 美元), 在小范围内示范替代技术, 在大范围(10 公顷)内试验最有前途的替代技术; 以及
- (b) 墨西哥用甲基溴熏蒸建筑物的替代办法(第二十六次会议, 总费用为 498 300 美元), 以在各种贮存和建筑设施中示范和评价七种甲基溴替代办法(单独和混合使用磷化氢、综合防治害虫、硅藻土、溴氰菊酯、热处理和冷处理)。

淘汰战略

24. 墨西哥现提交一个项目, 据此, 为实施 2005 年的甲基溴管制措施, 墨西哥政府将:

- (a) 实行甲基溴进口限制, 以确保到 2005 年 1 月甲基溴的最大消费量为 904.6 ODP 吨;
- (b) 为所有甲基溴用户举办关于现有替代技术的培训班。墨西哥政府决定, 不强迫农民采用哪一种替代办法, 因此不建议提供设备补偿金或增加经营费用; 甲基溴淘汰活动将着眼于宣传、培训、核查和传播那些自愿大幅度减少其消费量的农民所取得的成果上;
- (c) 与农民密切合作, 执行技术转让淘汰方案;
- (d) 核查减少地区、州和国家三级甲基溴消费量的情况;
- (e) 在适当的时候确定 2005 年后的甲基溴淘汰时间表。

25. 经过示范项目试验且已经执行的拟议替代技术包括: 单独使用一种替代化学品作为土壤杀虫剂或同时采用日晒方法, 以及使用非化学替代办法(生物熏蒸、无土培养基、蒸汽、浮盘系统和嫁接)。至于商品和建筑物熏蒸, 建议的技术包括磷化氢(片状或球状); 谷物杀虫剂(氟氯氰菊酯、甲基毒死蜱、马拉硫磷、溴氰菊酯、DE 或印楝); 冷处理; 热处理; 控制大气层或真空密封系统; 以及二氧化碳或其他惰性气体。所有建议的技术都将与害虫综合治理系统一起执行。

26. 技术援助方案总费用为 1 460 897 美元(土壤熏蒸 1 236 827 美元、商品熏蒸 224 070 美元)。逐渐淘汰甲基溴作为一种土壤杀虫剂的工作, 将由西班牙政府和工发组织共同实施, 熏蒸贮存产品方面的工作将由加拿大政府实施。

秘书处的评论和建议

评论

27. 秘书处对照提交给执行委员会第四十一次会议、后来由墨西哥政府撤回的国家甲基溴淘汰计划，审查了该项目提案。

提案的目的和范围

28. 甲基溴淘汰计划是按照甲基溴行业项目的修订战略和准则(第 32/80 号决定)并根据在墨西哥实施的两个甲基溴示范项目拟订的。在这方面，秘书处指出，提交的技术援助方案有重复，因为与建议的活动类似且具有同样的总体目标的活动已经实施过了。工发组织指出，技术援助方案中建议的活动与示范项目中的活动不同。提交给第四十二次会议的项目的总体目标是向甲基溴用户提供技术援助，使其减少甲基溴的消费量，以便落实墨西哥政府提出的在 2005 年减少 20%这一步。但是，有必要确定那些乐意自愿参加该技术援助方案的农民/用户。在拟订甲基溴淘汰计划过程中，确定了一些甲基溴用户。但是，由于甲基溴的关键用途提名(CUN)要求引起了误解，许多农民决定审查其以前的淘汰计划。

与费用有关的问题

29. 秘书处指出，某些项目部分没有资格得到经费，或其费用没有充足理由。具体问题和工发组织的答复如下：

- (a) 考虑到已经示范了替代技术并且已与主要有关利益方讨论了其结果，技术筛选讲习班(140 000 美元)和技术评价讲习班及后续行动(140 000 美元)将构成重复；而且已经为彻底淘汰甲基溴的每种作物和用途选择了替代技术；

工发组织指出，为个别农民/用户举办的讲习班是墨西哥政府拟议战略的主要内容。墨西哥政府不打算对整个行业实行一种单一的替代技术，而是告知农民/用户可提供的所有技术选择并支持他们自己决定。

- (b) 考虑到在墨西哥已经示范了大多数甲基溴替代技术，实现淘汰 20%甲基溴的目标可用的时间不多，目前也没有实施任何甲基溴替代技术，国内外顾问的费用(753 638 美元，几乎占方案总费用的 57%)没有正当理由。

工发组织指出，在技术援助项目中顾问部分非常重要，因为该项目不包含任何投资部分。此外，由于实现要求的甲基溴淘汰目标可用的时间有限(到 2004 年底)，顾问参与则很有必要，因为农民需要加速应用替代技术，以弥补自 2005 年起所能得到的甲基溴总量减少的那 20%。实施替代技术非常重要，因为该项目必须确保这一进程的可持续性。此外，政府的战略是目前不资助任何设备购置活动(以保证农民完全有可能自己决定采用哪种替代技术)，并将所有项目经费集中于培训/技术援助。

- (c) 出差次数(148 次)需要进一步说明理由(旅费和通信费为 90 750 美元)。

工发组织指出,墨西哥政府的战略是与各个州种植各种不同作物的经选拔并自愿参加的农民在规定时间内合作。出差这么多次是完全有理由的。

替代办法

30. 秘书处在考虑到下列事项后,向加拿大和西班牙两国政府以及工发组织建议了技术协助方案费用的替代办法:

- (a) 为了达到 2005 年的甲基溴淘汰目标,墨西哥政府请求援助;
- (b) 政府提出的战略:先与消息灵通或参与试验甲基溴替代技术的农民合作,并均衡地逐步淘汰不同作物和用途中的甲基溴;以及
- (c) 多边基金规则和政策。

31. 根据上述考虑因素,秘书处估计该项目提案第一阶段(例如淘汰 162.4 ODP 吨甲基溴)的成本效益平均值为 6.50 美元/公斤。为了计算建议的成本效益值,秘书处使用了国家淘汰计划中提交的、西红柿、智利喇叭花、草莓、瓜、浆果和大蒜方面淘汰甲基溴的数值。至于切花和商品熏蒸,其成本效益值分别为 15.00 美元/公斤和 11.50 美元/公斤(与执行委员会迄今核准的其他项目相似),而不是淘汰计划中的数值(花卉为 33.70 美元/公斤、商品为 32.40 美元/公斤)。这些数值列于下表:

作物/用途	ODP	基本建设 费(美元)	经营费 (美元)	培训费 (美元)	应急费 (美元)	总计 (美元)	美元/ 公斤
西红柿	315.8	434 540	132 197	394 445	82 898	1 044 080	3.31
智利喇叭花	116.4	162 907	46 013	145 438	30 834	385 192	3.31
草莓	187.9	122 465	254 428	33 054	15 552	425 499	2.26
瓜	88.2	911 062	(34 671)	330 953	124 202	1 331 546	15.10
浆果	52.7	44 068	154 777	182 899	22 697	404 441	7.67
大蒜	40.5	81 600	79 968	61 701	14 330	237 599	5.87
蔬菜种植	53.3	139 320	132 379	171 881	31 120	474 700	8.91
花卉	74.7					1 120 500	15.00
商品	119.8					1 377 700	11.50
小计	1 049.3	1 895 962	765 091	1 320 371	321 633	6 801 257	6.48
烟草	17.8			-	-	-	
总计	1 067.1	1 895 962	765 091	1 320 371	321 633	6 801 257	6.37

32. 考虑到不要求多边基金提供经费来逐渐停止用甲基溴熏蒸烟草苗床，所以在计算成本效益平均值时没有考虑用于熏蒸烟草苗床的 17.5 ODP 吨甲基溴。墨西哥政府将可以灵活利用所能得到的资源逐步停止在它认为较合适的任何作物或用途中使用甲基溴。

33. 工发组织拒绝采用秘书处建议的费用模型，因为基本建设和经营费用以及成本效益值都不适用并且不能满足技术援助方案的需要，该方案包含重要的培训部分。不过，加拿大和西班牙两国政府以及工发组织后来同意将项目提案调整如下：915 000 美元(由西班牙政府和工发组织共同执行)和 190 000 美元(由加拿大政府执行)。在此基础上，秘书处能够与双边和执行机构就 1 105 000 美元的建议费用达成一致。

34. 秘书处注意到，该项目的订正费用与秘书处利用建议的平均成本效益值得出的费用大致相同。

建议

35. 基于上述考虑，谨提议执行委员会考虑批准该项目提案。

项目评估表

墨西哥

行业： 淘汰 所有行业消耗臭氧层物质使用量(2002 年)： 1 944.7 ODP 吨
 次级行业成本效益临界值： 不适用

项目名称：

(a) 国家 CFC 淘汰计划(第一期)

项目数据	多重
	国家计划
企业消费量 (ODP 吨)	1 944.7
项目影响 (ODP 吨)	1 669.0*
项目期限 (月)	70
申请的初始金额 (美元)	3 517 000
最终项目费用 (美元)：	
增加基本建设费用 (a)	
应急费用 (b)	
增加经营费用 (c)	
项目总费用 (a+b+c)	8 794 500
当地所有权 (%)	100
出口部分 (%)	0
第一期申请的金额 (美元)	3 517 000
成本效益 (美元/公斤)	5.26**
对应方供资是否确认？	
国家协调机构	环境部(SEMARNAT)
执行机构	工发组织

秘书处的建议	
建议金额 (美元)	
项目影响 (ODP 吨)	
成本效益 (美元/公斤)	
执行机构支助费用 (美元)	
向多边基金申请的总费用 (美元)	

* 该计划的总影响为 1 669.0 ODP 吨。第一期的影响为 0 ODP 吨。

** 淘汰计划的成本效益。

行业背景CFC(附件 A 第一类)消费量和淘汰概况

按照第 35/37 号决定，墨西哥挑选选择 1 为起点。在第三十五次会议上，墨西哥与执行委员会就以下起点达成一致意见：	3 059.5 ODP 吨
- 截至 2004 年 2 月有资格获得资金的 CFC 剩余消费量(根据上述协定)	2 483.3 ODP 吨
- 2002 年 CFC 总消费量	1 967.0 ODP 吨
- 截至 2004 年 2 月现有项目的 ODP 总量	237.2 ODP 吨

项目说明

36. 在第四十一次会议前，秘书处与工发组织就建议的墨西哥制冷部门淘汰计划，包括一项协定草案达成一致，并将其提交执行委员会审议。该项目的详细说明载于 UNEP/OzL.Pro/ExCom/41/48 号文件。在执行委员会审议该项目的过程中，有人建议，制冷行业计划应该作为墨西哥国家 CFC 综合淘汰计划重新拟订，纳入其他行业其余的 CFC 消费量。人们认识到，按照核准的生产行业淘汰计划，需要将一定数量的 CFC 储存起来。这在一份新的协定草案中得到反映。该项目提案被延迟，并通过了第 41/69 号决定。

37. 工发组织代表墨西哥政府重新拟订了制冷行业淘汰计划并提交了国家 CFC 淘汰计划(计划)，以期在 2003-2010 年期间在墨西哥逐步停止对附件 A 第一类受控物质中的 1 967 ODP 吨的剩余消费。该计划将使墨西哥政府能够在 2010 年 1 月 1 日之前逐步停止对 CFC 的消费。

38. 该计划涉及的大部分 CFC 消费量集中在制冷行业。该计划在泡沫塑料、气雾剂和杀灭剂行业中的现有项目中纳入了淘汰活动。该计划指出，在 2009 年之前计量吸入器(MDI)行业的消费量将停留在 5.0 ODP 吨水平上，在 2010 年将利用执行该计划所申请的经费淘汰这一数量的消费。

39. 按照该计划，2003 和 2004 年 CFC 的估计需求量高于 2002 年的需求量。2005 年的需求量将开始减少。2007 年，估计需求量将超过《蒙特利尔议定书》确定的具体控制目标。但是，依据第 7 条报告的 CFC 消费量将与该议定书确定的墨西哥消费量最高界线一致，因为国内需求量将从库存中满足。预计所有制造业的 CFC 消费量将在 2006 年前逐步停止，只有计量吸入器(MDI)行业使用 5.0 ODP 吨，后者可以在 2009 年逐步淘汰。2006 年以后制冷服务行业将对纯 CFC 尚有需求。这种需求将随着培训、回收/再循环和该计划建议的制冷设备改型方面开展新活动而减少。根据《蒙特利尔议定书》第 1 条界定的生产+进口

—出口的CFC消费量计算,墨西哥将在2005年实现减少50%的目标,2007年实现减少85%的目标,2010年之后实现零消费目标,具体进展情况将按照《议定书》第7条予以报告。

40. 按照墨西哥生产行业现行的协议,CFC将在2005年停产。2005年以后的需求量将主要从库存中满足,库存将在2004和2005年因在上述协议确定的界限内CFC产量过剩而积压。

41. CFC需求量和拟议的减少使用CFC时间表方面的综合信息在下表中列示。

年份	2002年	2003年 估计数	2004年	2005年	2006年	2007年	2008年	2009年	2010年
	(单位: ODP 吨)								
蒙特利尔议定书的减少时间表	4 625	4 625	4 625	2 312	2 312	694	694	694	0
作为第7条数据的消费量	1 944	1 989	4 300	2 312	500	400	300	200	0
库存方面的年度变化	18	17	2 349	411	-915	-631	-381	-131	0
所有行业的总需求量	1 926	1 972	1 952	1 902	1 415	1 031	681	331	0
所有行业现有活动的总减少量	0	0	20	0	192	85	0	0	0
所有行业新活动的总减少量	0	0	0	50	294	300	350	350	331
所有行业每年的总减少量	0	0	20	50	486	385	350	350	331
工业气雾剂行业的需求量	70	70	70	70	70	0	0	0	0
现有活动的减少量	0	0	0	0	0	70	0	0	0
新活动的减少量	0	0	0	0	0	0	0	0	0
MDI行业的需求量	5	5	5	5	5	5	5	5	0
现有活动的减少量	-	0	0	0	0	0	0	0	0
新活动的减少量	-	0	0	0	0	0	0	0	5
泡沫塑料行业的需求量	192.0	192	192	192	0	0	0	0	0
现有活动的减少量	0.0	0	0	0	192	0	0	0	0
新活动的减少量	0.0	0	0	0	0	0	0	0	0
杀灭剂行业的需求量	14.5	14.5	14.5	14.5	14.5	0	0	0	0
现有活动的减少量	0	0	0	0	0	14.5	0	0	0
新活动的减少量	0	0	0	0	0	0	0	0	0
制冷行业的需求量	1 644.1	1 690.0	1 669.6	1 619.6	1 325.4	1 025.4	675.4	325.4	0
现有活动的减少量	0	0	20.4	0	0	0	0	0	0
新活动的减少量	0	0	0	50.0	294.2	300.0	350.0	350.0	325.4

42. 墨西哥政府将拟订一份详细规章以监测和控制本国的消耗臭氧层物质(ODS)的使用情况。该规章的最重要内容包括:

- 按照《蒙特利尔议定书》中规定的义务逐步减少ODS在所有行业中的使用量。该规则对于CFC的所有生产商、进口商、出口商、经销商、卖主和商业及工业消费者都是义务的;
- 只允许CFC贸易满足该国的基本国内需求和重要用途。该规章将包括2010年前每年允许的最高使用量时间表;
- 禁止生产或进口所有类型的制冷设备、空调设备、推进剂、多孔塑料或使用或包含CFC的溶剂清洁作业,但与《蒙特利尔议定书》所规定的重要用途有关的除外;
- 该规章还将制订细则以控制再循环或再加工的CFC的贸易。

43. 与提交第四十一次会议的制冷行业计划相比,本计划中的淘汰活动没有重大变化。在第四十二次会议上申请核准相同水平的经费额,按细目分类如下:

项目内容	小计	2004 年 部分	2005 年 部分	2006 年 部分
项目管理和技术支持	799 500	350 000	350 000	99 500
制冷制造业方案	300 000	300 000		
海关培训	338 700	338 700		
国家服务技师培训项目	1 928 300	1 928 300		
国家制冷剂回收和再循环项目	4 928 000	600 000	4 328 000	
改型和替代激励方案	500 000		300 000	200 000
项目费用总额	8 794 500	3 517 000	4 978 000	299 500
执行机构管理费用	659 588	263 775	373 350	22 463
赠款总额	9 454 088	3 780 775	5 351 350	321 963

44. 墨西哥政府将在工发组织协助下对该计划进行总体管理。

45. 执行该计划需要与墨西哥政府正在执行的各种政策、规章、财政、宣传和能力建设行动密切挂钩和协调,以确保与政府优先项目保持一致。

46. 政府将对改用非 ODS 技术的公司的 ODS 消费量进行监测。在制订全国制冷剂回收和再循环计划之后,监测活动将扩展范围,包括所有再循环中心和维修车间。许可证制度将成为监测和确保控制措施得到遵守的工具。

秘书处的评论和建议

评论

47. 2002 年墨西哥报告的 CFC 消费量为 1 926 ODP 吨。按照秘书处现有的记录,墨西哥全部现有项目的 CFC 消费量为 237.2 ODP 吨。国家淘汰计划的 CFC 淘汰总影响为 1 706.8 ODP 吨。

48. 墨西哥的其余消费量大部分是在制冷行业。墨西哥与工发组织就这一行业的淘汰时间

表达成一致,并将该时间表列入作为制冷业 CFC 淘汰计划的一部分提交给第四十一次会议的协定草案中。已经修订了该计划的淘汰时间表(主要根据制冷业淘汰时间表)。拟议的消费限量自 2005 年起开始增加。2007 年,预测的 CFC 需求量 1 031 ODP 吨将比《蒙特利尔议定书》给予墨西哥规定的控制界线(694 ODP 吨)多出 337 ODP 吨。依据该计划中的修订淘汰时间表,2003-2010 年间的 ODP 排放总量将比在第四十一次会议上提交的协定草案增加了 1 227 ODP 吨。墨西哥政府向秘书处报告的、作为国家方案执行报告一部分的 1998-2002 年间 CFC 消费数据指出,墨西哥制冷维修业的 CFC 需求量在逐步减少(从 1998 年的 2 400 ODP 吨减至 2002 年的 1 600 ODP 吨)。如上所述,制冷维修业的 CFC 消费量占墨西哥全国 CFC 需求量的绝大部分。秘书处要求工发组织做出澄清,说明自 2005-2009 年以来每年制冷行业的预测消费量比提交给第四十一次会议的消费量调高的原因。秘书处建议,工发组织应根据实际需要并以减少修订计划中加重的环境影响为目标,重新评估 CFC 需求量和 CFC 减少时间表。

49. 2005 年以后的 CFC 需求量将完全由停产前积压的库存量来满足。秘书处向工发组织指出,预计库存量与生产和第 7 条消费量停止之后该国的实际需要,包括 2010 年以后结尾服务时期的需要一致,也与停产前生产行业协定中的产量水平一致。

50. 关于泡沫塑料行业,秘书处建议工发组织在该计划中反映开发计划署最近收到的有关该行业的修订淘汰时间表的情况。

51. 墨西哥正与工发组织讨论上文提出的问题以及执行委员会与墨西哥政府之间的协定草案。关于讨论结果的咨询意见将在执行委员会会议之前酌情提出,同时虑及第 41/80 号决定。

建议

52. 待提供。

2003 年墨西哥 CFC 生产行业审计报告以及墨西哥淘汰 CFC-11 和 CFC-12 生产行业的行业计划：2004 年度执行方案

背景

53. 执行委员会在 2003 年第四十次会议上原则上核准总额 3 185 万美元，用于执行墨西哥氯氟化碳(CFC)生产行业协定，并为该项目划拨了第一期 530 万美元。根据上述协定，墨西哥政府承诺遵守以下双重条件，即在 2003-2005 年期间 CFC 的总产量最高为 22 000 公吨，同时在任何三年内不超过协定规定的所允许的最高产量限额。协定的基本要素列于下表：

国家	墨西哥
项目名称：	淘汰 CFC-11 和 CFC-12 生产行业的行业计划
计划年份	2004 年
已完成年数	1 年
计划剩余年数	3 年
2003-2005 年允许的 CFC 最高产量	22 000 公吨
2003 年和 2004 年允许的 CFC 年度最高产量	12 355 公吨
2003 年 CFC 的实际产量	8 694 公吨
建议的 2004 年允许的最高产量	10 400 公吨
原则上核准为 CFC 淘汰计划的供资总额	3 185 万美元
截至 2003 年 12 月发放的供资总额	530 万美元
为 2004 年度计划申请的供资额	1 070 万美元

54. 发放 2003 年以后的几期供资有以下条件限制，即工发组织对前一年产量是否符合《蒙特利尔议定书》的要求并在协定允许的总产量限额之内进行独立核查并提交相关报告和计划年份的工作方案。因此，工发组织提交了关于墨西哥 2003 年 CFC 产量的核查报告，其中包括 2004 年度工作方案，其供资额为 1 070 万美元外加 802 500 美元的支助费。

墨西哥 2003 年 CFC 产量的核查

55. 核查由印度的一家咨询事务所—Ess Jay 咨询事务所于 2004 年 1 月进行。在上报参加该项审计工作的人员中，三人具有工程方面的背景，一人曾经作过 CFC 和氯甲产品的制造商。报告包括行政摘要、报告本身和按执行委员会 2000 年核准的核查淘汰消耗臭氧层物质生产的准则中规定的格式提交的数据。报告首先简要说明 Quimobasicos 氯氟化碳厂的历史，那里有两个生产单位具有生产 CFC 和 HCFC-22 的能力。不过，由于 CFC 的需求不足，自 1995 年以来，只有一个车间继续生产 CFC，而另一个车间专门生产 HCFC-22。2003 年，大概由于 CFC-11 的需求量减少，后者试验只通过回收 CFC-11 来生产 CFC-12。

56. 核查报告介绍了对 2003 年账面和仓库中 CFC-11 和 CFC-12 以及 CFC 和 HF 原料的期初库存的审计情况。然后，报告说明了 2003 年原料消费的核查情况，核查时检查了财务部门提供的购货清单并核对了一些发票。报告还说明了日常生产流程和制成品在厂内的流

动情况，记录了实际产量、净产量和灌装损失。核查报告说为证实 CFC 产量，抽样检查了几天的记录。还对照历史记录和工业规范检查了原料消费率，据报告有关消费率是可以接受的。

57. 然后，检查了 CFC 产品的包装过程，说明了厂内的下一道程序。对会计账册进行了抽查，查验了不同包装的重量，并用气体色层分析法检查了气体质量。核查工作最后检查的是销售记录以及 CFC 产品和原料的期末库存。报告还有 10 个附件，是所检查的原始记录的复印件。

58. 核查结果是，Quimobasicos 在 2003 年生产了 8 694 公吨 CFC，其中包括 1 291 公吨 CFC-11 和 7 402 吨 CFC-12。这低于所允许的年度最高总产量 12 355 公吨，而且在从 2003-2005 年所允许的最高总产量 22 000 公吨中减去 2003 年的产量后，剩下的 2004-2005 年所允许的最高总产量是 13 306 公吨。该厂 2003 年 CFC 的销售总量为 8 844 公吨，其中包括 150 公吨库存产品。家用和出口销售的细目为，家用 967 公吨，出口 7 877 公吨。

59. 核查小组收集的数据按核查淘汰消耗臭氧层物质生产的准则中规定的格式列出，其中包括每个月的 CFC 和 HCFC-22 产量、生产天数、原料对 CFC 和 HCFC-22 产量的消费率 CFC 和 HF 原料库存变化，以此作了核实 CFC 产量的一种方式。

2004 年工作方案

60. 2004 年工作方案共有三个部分，即项目摘要、2003 年度工作方案成果以及 2004 年工作方案的目標和活动。项目摘要包括 2004 年工作方案的目標和供资水平。2004 年 CFC 生产水平的目標为最多 10 400 公吨 CFC，这需要提供资金 1 070 万美元外加 802 500 美元的支助费。

61. 2003 年工作方案成果报告说 Quimobasicos 的 CFC 总产量为 8 694 公吨，此数字低于协定规定的允许的年度最高产量 12 355 公吨。在为 2003 年工作方案拨付的 530 万美元中，4 998 500 美元将作为补偿支付给 Quimobasicos，剩下的 301 500 美元分给了将在 2003 年和 2004 年内执行的技术援助活动。为促使淘汰 CFC 生产，2003 年规划并实施了一些政策措施。这包括对 CFC 和 CTC 的进口许可证管制措施，对 CFC 生产商可依法强制执行的生产配额制度，CFC 生产商向国家臭氧机构提交季度报告，政府官员定期视察 CFC 生产厂，以及对超过生产配额或提供虚假信息的惩罚条款。计划在 2003 年和 2004 年开展一些技术援助活动，其中包括提高公众认识运动，培训 CFC 交易商和海关官员，以及建立一个信息管理系统。

62. 2004 年的目標，即允许的最高产量 10 400 公吨，将通过 2004 年 1 月采用的强制性 CFC 生产配额和对 CFC 进口的管制来落实。根据 CTC 对 CFC-11 和 CFC-12 生产的消费率，墨西哥政府将批准 2004 年最多 12 000 公吨 CTC 的进口配额。在为 2004 年申请的总计 1 070 万美元中，1 060 美元将拨付给 Quimobasicos，用于遵守上述生产配额，剩下的 10 万美元将分配给技术援助活动。该方案提出了一些技术援助活动，其中包括建立一个消耗臭氧层

物质信息管理系统、培训、技术稽核和一般项目管理。2004 年工作方案的最后是 2004 年和 2005 年技术援助活动时间表和估计费用。

评论

63. 2004 年工作方案提出墨西哥允许的 CFC 最高产量为 10 400 公吨,这是在墨西哥 12 355 公吨的 CFC 产量基准以及协定确定的所允许的年度最高产量限额之内。2003 年 8 694 公吨的总产量加上建议的 2004 年的目标等于 19 094 公吨,这在 2003-2005 年所允许的最高总产量 22 000 公吨的范围之内,使 2005 年允许的最高产量为 2 906 公吨,该数字在协定规定的该年允许的产量 6 739 公吨的范围之内。

64. 除现有对 CFC 生产的主要原料 CTC 进口的管制措施外,墨西哥政府于 2004 年 1 月又采用了强制性的 CFC 生产配额制度,以控制 CFC 的生产。墨西哥政府还采取了一些其他促进措施来淘汰 CFC 生产,其中包括 CFC 生产商向国家臭氧机构提交季度报告。

65. 这是根据墨西哥 CFC 生产协定实施的第一次核查活动,还在努力遵守核查淘汰消耗臭氧层物质生产的准则。不过,根据该准则,核查小组应包括一名具有财会知识的成员,但负责墨西哥审计工作的核查小组中却没有这样的成员。应更为详细地说明核查小组在视察工厂期间所采用的方法和具体步骤。

66. 此次核查引入了净产量的概念,其定义为实际产量减去灌装损失。所报告的损失为 1 公吨,所核查的总产量并未从实际产量中减去灌装损失。不过,报告指出净产量的概念是依照协定提出的。重要的是要说明,协定中从未使用过这个概念,因为:

- (a) 它与根据《蒙特利尔议定书》所使用的产量定义不一致,在后者中,所生产的一公吨 CFC 须如实记录,无论它是否售出。此外,国家履行议定书规定义务的情况按生产的而非售出 CFC 度量。这也是被授予权协助履约的多边基金适用的定义。
- (b) 它并不能促进实现《蒙特利尔议定书》的环境目标,因为如果不计灌装损失,就无法激励 CFC 生产商减少这种损失,因而减少 CFC 向大气的排放量。

67. 按照提交 CFC 产量核查报告的惯例,秘书处只列入了总数据,而且除一个用图形说明 CTC 和 HF 消费与 CFC 产量的相关性的附件外,没有附上其他附件。不过,执行委员会的任何成员均可索取这些附件。

建议

68. 秘书处建议执行委员会：

- (a) 注意到 2003 年 CFC 产量核查报告。
 - (b) 核准墨西哥淘汰 CFC 生产协定的 2004 年工作方案，其供资额为 1 070 万美元外加给工发组织的支助费用 802 500 美元。
 - (c) 要求以后的核查报告更详细地说明所采用的方法和采取的具体步骤。
 - (d) 请工发组织在核查小组中安排一名具有财会背景的成员。
 - (e) 请工发组织及其他有关执行机构用所生产而不是所售出的 CFC 及其他消耗臭氧层物质的实际吨数来记录和核查淘汰 CFC 及其他消耗臭氧层物质生产的情况。
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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	<p>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.</p> <p>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.</p>
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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

	1 st Tranche	2 nd 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 Remaining to 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 2003².

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 understood 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 CICOPRAFEST. 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.

Achievement in 2003

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	<p>Following activities were determined for the Awareness campaign; preparation of triptics and brochures, and a video production.</p> <p>TOR for design is in preparation. The organization of an event to announce the CFC closure production in Mexico.</p>
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 41 st ExCom was deferred, and the national CFC phase out plan (NPP) was prepared based on the SPP and submitted to the 42 nd 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 42 nd 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	40 th 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 42 nd 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. Through 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)

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DATE OF SUBMISSION: 09.02.2004

DATE OF REVISION: 27.02.2004

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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.

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. 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 1 st 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	<u>CFC-11</u>	<u>CFC-12</u>
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 Cortines # 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

ODS Products	No of lines	Capacity in baseline year	Production									
			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.

Mexico CFC Production Sector Audit Report (for 2003) – February 2004 (revised)

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

Mexico CFC Production Sector Audit Report (for 2003) – February 2004 (revised)

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-12¹ 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

	<u>CFC-11</u>	<u>CFC-12</u>
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 vacuumized 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

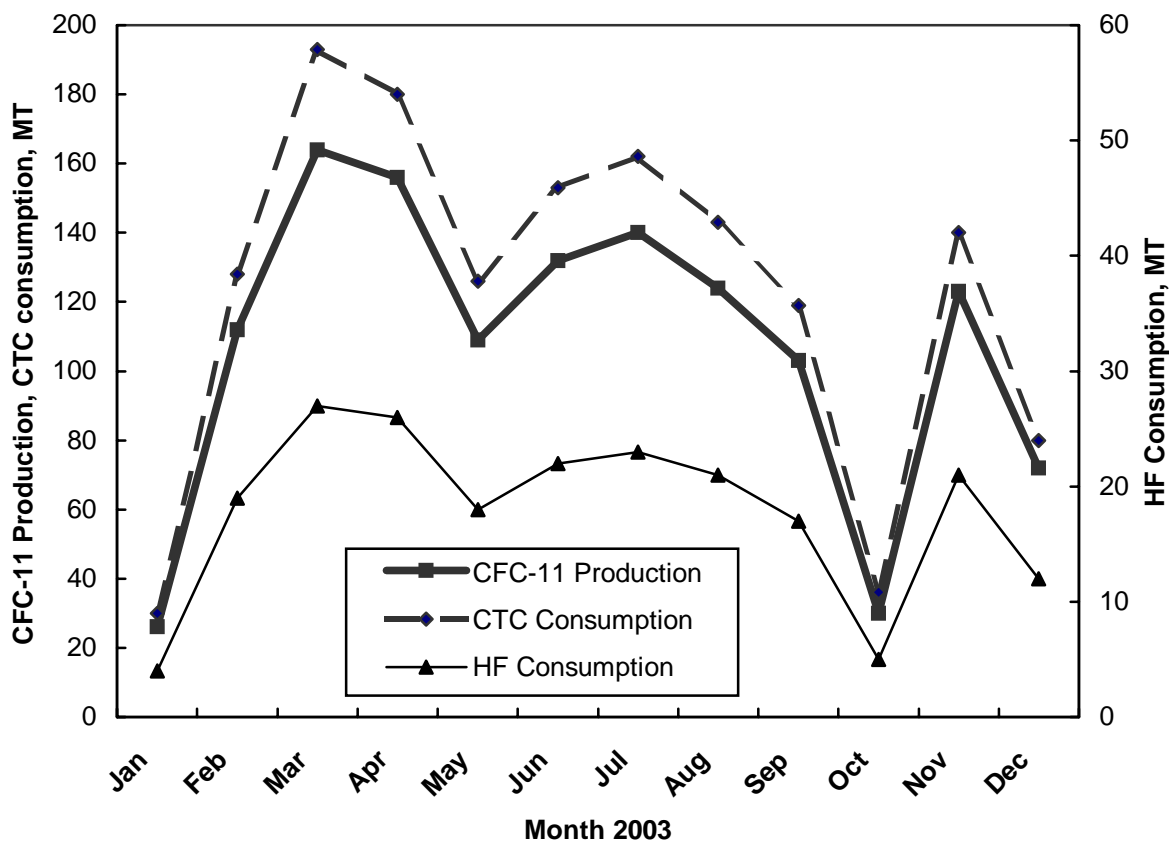
Annexure 7 shows the check list of the audit process with the guidelines, steps to be included and steps taken out of the guidelines.

ANNEXURES

ANNEXURE 3C

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

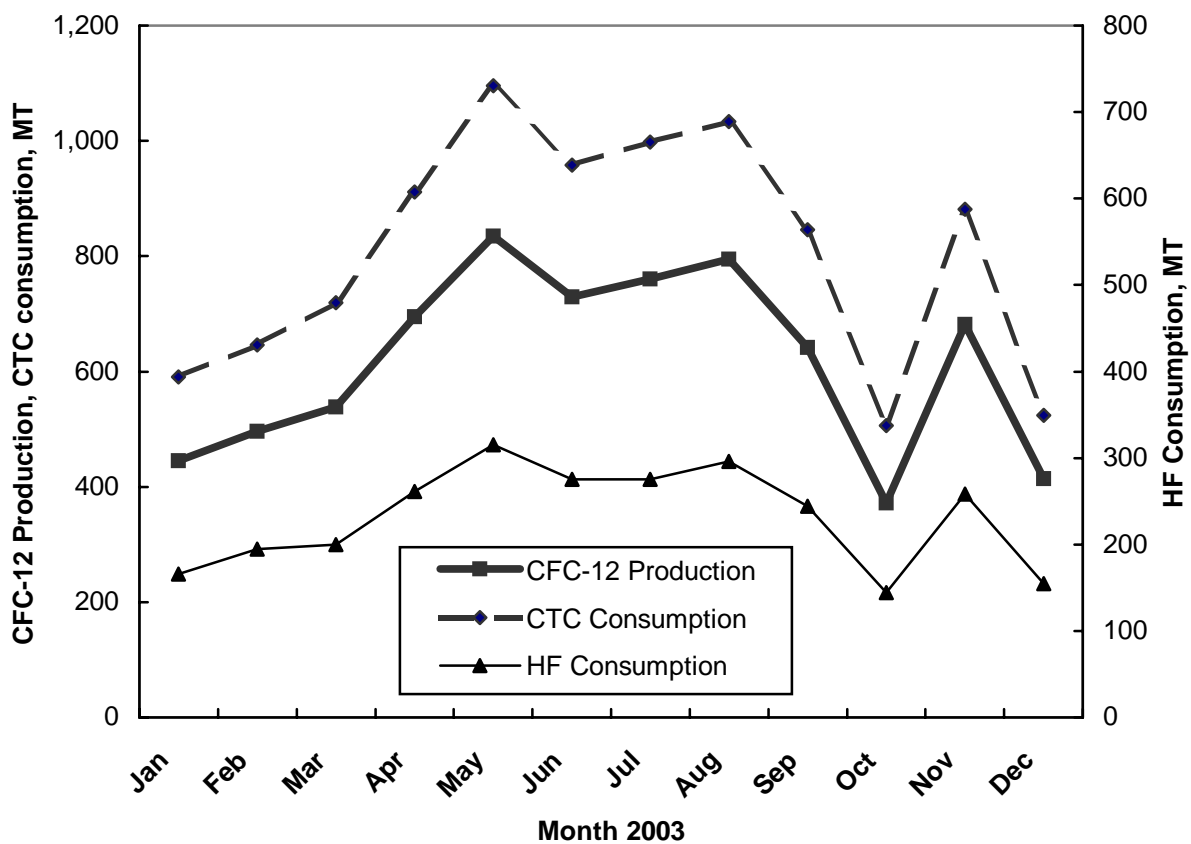
Month	CFC-11 Production	CTC consumption	HF Consumption
Jan	26	30	4
Feb	112	128	19
Mar	164	193	27
Apr	156	180	26
May	109	126	18
Jun	132	153	22
Jul	140	162	23
Aug	124	143	21
Sep	103	119	17
Oct	30	36	5
Nov	123	140	21
Dec	72	80	12
Total	1,291	1,490	215



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
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