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The World Bank

Report No:ICR0000130

IMPLEMENTATION COMPLETION AND RESULTS REPORT  
(MULT-22018)

ON A

LOAN/CREDIT IN THE AMOUNT OF  
USD MILLION 5.70

(USD 5.70 MILLION LOAN)

TO

Mexico

FOR

Third Ozone Depleting Substances Phase out (Montreal Protocol)

October 10, 2006

LCE ENV Family  
WB Off: Mexico-Mexico and Colombia  
LATIN AMERICA AND CARIBBEAN

## CURRENCY EQUIVALENTS

( Exchange Rate Effective )

Currency Unit =

1.00 = USD

USD 1.00 =

Fiscal Year

## ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
CFC	Chlorofluorocarbons
CTC	Carbon Tetrachloride
EIA	Environmental Impact Assessment
ExCom	Executive Committee of the Montreal Protocol Multilateral Fund
IA	Implementing Agency
INE	Instituto Nacional de Ecología
GOM	Government of Mexico
MAC	Mobile Air Conditioning
MeBr	Methyl Bromide
MOD	Memorandum of the Director
MP	Montreal Protocol
MPMF	Montreal Protocol Multilateral Fund
MT	Metric Tonnes
NAFIN	Nacional Financiera, S.A.
NPV	Net Present Value
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substance
OORG	Ozone Operations Resource Group
OPU	Ozone Protection Unit
OTF	Ozone Trust Fund
PSR	Project Supervision Report
SEMARNAT	Secretaría de Ambiente y Recursos Naturales
TCA	Methyl Chloroform
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
UNIDO	United Nations Industrial Development Organization
WB	The World Bank

Vice President: Pamela Cox

Country Director: Isabel Guerrero

Sector Manager: Abel Mejía

Project Team Leader: Horacio Cristián Terraza

**Mexico**  
**Third Ozone Depleting Substances Phase out (Montreal Protocol)**

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<b>1. Basic Information</b>			
Country:	Mexico	Project Name:	Third Ozone Depleting Substances Phase out (Montreal Protocol)
Project ID:	P050429	L/C/TF Number(s):	MULT-22018
ICR Date:	08/16/2006	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	NAFIN
Original GEF Grant Amount	USD13.0M	Disbursed Amount:	USD5.7M
<b>Environmental Category:</b>	C	GEF Focal Area	O
<b>Implementing Agencies</b>			
Nacional Financiera			
<b>Co-financiers and Other External Partners</b>			

<b>2. Key Dates</b>				
Process	Date	Process	Original date	Revised/actual date(s)
Concept Review:	09/14/1997	Effectiveness:		08/07/1998
Appraisal:	09/25/1997	Restructuring(s):		
Approval:	11/08/1997	Mid-term Review:		05/07/2001
		Closing:	06/30/2002	06/30/2006

<b>3. Ratings Summary</b>	
<b>3.1 Performance Rating by ICR</b>	
Outcomes:	Satisfactory
Risk to Global Environment Outcome	Low or negligible
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

<b>3.2 Quality at Entry and Implementation Performance Indicators</b>			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at Any Time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at Any Time (Yes/No):	No	Quality of Supervision (QSA):	Moderately Satisfactory
GEO Rating before	Satisfactory		

Closing/Inactive Status			
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<b>4. Sector and Theme Codes</b>		
	<b>Original</b>	<b>Actual</b>
<b>Sector Code (as % of Total Bank financing)</b>		
Banking	3	3
General industry and trade sector	97	97
	<b>Original Priority</b>	<b>Actual Priority</b>
<b>Theme Code (Primary/Secondary)</b>		
Climate change	Primary	Primary
Pollution management and environmental health	Primary	Primary

<b>5. Bank Staff</b>		
<b>Positions</b>	<b>At ICR</b>	<b>At Approval</b>
Vice President:	Pamela Cox	Shavid Javed Burki
Country Director:	Isabel Guerrero	Oliver Lafourcade
Sector Manager:	Abel Mejía	Adolfo Brizzi
Project Team Leader:	Horacio Cristián Terraza	Enrique Vanegas
ICR Team Leader:	Horacio Cristián Terraza	
ICR Primary Author:	Hernán M. González Figueroa	

## **6. Project Context, Global Environment Objectives and Design**

The Third Ozone Depleting Substances Phase out Project assisted Mexico in phasing out Ozone Depleting Substances (ODS). The project financed the incremental costs of conversion to non-ODS technology for a group of priority cost-effective sub-projects in four industrial sectors, contributing to reduce ODS consumption in Mexico.

This project was the third Bank-implemented ODS phase out operation (ODS III) in Mexico. The first was the Ozone Protection Pilot Recycling and Training Project (OTF 21924, or ODS I), a USD180,000 grant for a demonstration mobile air conditioning (MAC) service recycling sub-project and aerosol sector safety training sub-project. The OTF Grant was signed on April 16, 1992, and closed on December 31, 1995. The aerosol safety sub-project was not carried out because of contractual difficulties.

The second operation (ODS II) was the Ozone Policy and Institutional Strengthening Project (OTF 21920), a USD4 million OTF Grant approved on December 7, 1992, effective on June 17, 1993, and closed on December 31, 1996. Thirteen investment sub-projects were approved, with grants totaling USD3.98 million. The realized phase out was approximately 210 megatonnes (MT)/year ODP, with a cumulative grant effectiveness of USD18.95/kilograms (kg)/year.

The sub-sections below describe the country context at appraisal and the objectives, components, and main outcomes of ODS III.

### **6.1 Context at Appraisal**

The Montreal Protocol (MP) on Substances that Deplete the Ozone Layer was adopted in 1987 as an international treaty to eliminate the production and consumption of ozone-depleting chemicals including chlorofluorocarbons (CFCs), halons, carbon tetrachloride (CTC), methyl chloroform (TCA), and methyl bromide (MeBr). Scientific theory and evidence suggest that these compounds, once emitted to the atmosphere, could significantly deplete the stratospheric ozone layer that shields the planet from damaging UV-B radiation. Under this treaty, developed countries must phase out ODS by the year 2000 (2005 for TCA and MeBr). Developing countries, also known as Article 5 countries in the context of the protocol, benefit from a 10-year grace period. Table 1 below shows the phase out schedule for Article 5 countries.

Mexico signed the Montreal Protocol (MP) in 1987 and in March 1988 became the first country to ratify it. Under the MP, the Government of Mexico (GOM) committed to a) freezing 1999 CFC consumption at average 95-97 consumption levels, b) reducing CFC consumption by 50 percent by 2005, c) reducing CFC consumption by an additional 35 percent by 2007, and d) phasing out CFC consumption by 2010. The country's remaining commitments under the MP are summarized in Table 1 below.

**Table 1. Phase out schedule for Article 5 countries**

Date	Ozone Depleting Substance (Annex and Group)					
	Annex A Group I CFCs	Annex A Group II Halons	Annex B Group II CTC	Annex B Group III TCA	Annex E MeBr	Annex C Group I HCFC
Jul. 1999	Freeze consumption					
Jan. 2002	Freeze consumption			Freeze consumption		
Jan. 2003	Freeze consumption					
Jan. 2005	Reduce by 50%	Reduce by 50%	Reduce by 85%	Reduce by 30%	Reduce by 20%	
Jan. 2007	Reduce by 85%					
Jan. 2010	Reduce by 100%	Reduce by 100%	Reduce by 100%	Reduce by 70%		
Jan. 2015				Reduce by 100%	Reduce by 100%	
Jan. 2016						Freeze consumption
Jan. 2040						Reduce by 100%

Source: World Bank, based on Montreal Protocol

In the early 1990s, the GOM launched an initiative to eliminate most of the consumption of CFCs by the year 2000. By 2001, 85% of the ODS consumption in 1990 had been eliminated.<sup>1</sup> This was a significant achievement by the country, since it was only required to reduce its CFC consumption by 50% in the year 2005. This large reduction was achieved by eliminating consumption from the largest consumers and by regulating the production sector. In addition, a license and quota system was established on December 2004. Any ODS imported to Mexico must be assigned a quota and obtain an import license. These tight controls have allowed the country to meet its commitments under the Montreal Protocol. By the time the III ODS phase-out project was developed, remaining consumption of ODS in Mexico was only in the smallest sectors, with small consumers. This made these sectors very complicated and required innovative solutions to make the project successful.

*ODS Phase out Institutional Structure and Project Background*

<sup>1</sup> As mentioned before, developing countries had a grace period until July 1999 to freeze their CFC consumption. Mexico went beyond the MP commitments and

At the time the Third Ozone Depleting Substances Phase out Project was prepared, Mexico's National Ecological Institute (*Instituto Nacional de Ecología*, or INE) was in charge of coordinating activities to promote phase out of ODS as mandated in the Montreal Protocol.

In 1991 the Ozone Protection Unit (OPU) was created in the INE with a 3-year grant from the U.S. Environmental Protection Agency. Under INE's supervision, the OPU is made responsible for establishing and monitoring the ODS phase out program. Through the OPU, the INE was given broad policy, regulation, and monitoring mandates and later sub-project identification, preparation, and implementation supervision roles for the first two Bank ODS phase out operations in Mexico (OTF 21920 and OTF 21924). INE was also responsible for coordinating with other ministries and institutions involved in ODS phase out, including monitoring activities of the four multilateral implementing agencies of the Montreal Protocol Multilateral Fund, or MPMF. These agencies are the World Bank, the United Nations Development Program (UNDP), the United Nations Industrial Development Organization (UNIDO), and the United Nations Environmental Program (UNEP).

World Bank MP Projects depend on OTF enterprise beneficiaries to develop their own engineering solutions, which are then presented to counterpart executing agencies and the Bank's Ozone Operations Resource Group (OORG) for endorsement before transmittal to the Executive Committee of the Multilateral Fund (ExCom) for funding approval. Procurement for Bank-implemented sub-projects is the responsibility of the enterprises themselves. In Mexico, grants are disbursed to the enterprises through the National Finance Company (*Nacional Financiera S.A.*, or NAFIN).

Building from lessons from ODS II, and to streamline sub-project processing, NAFIN was appointed as sole counterpart executing and financial agency for ODS III.<sup>2</sup> INE's role was limited to oversight and official endorsement, but without active participation in the clearance process. INE could review sub-projects for funding eligibility, technical soundness, and compliance with the objectives of the MPMF, but NAFIN was to be involved in clearance of procurement and disbursement documentation, selection and contracting of technical consultants, and signing of sub-grant agreements. The Directorate of Ecological Ordinance and Environmental Impact (*Dirección General de Ordenamiento Ecológico e Impacto Ambiental*, or DGOEIA), now merged with INE, reviewed sub-project environmental impact and risk assessment and coordinated ecological planning and zoning to ensure that sub-projects were in compliance with Mexican law and Bank policies.

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<sup>2</sup> ODS II executing and financing responsibilities were divided between NAFIN and INE as follows: NAFIN was responsible for forwarding sub-project to the Bank for review and approval, reviewing compliance and procurement procedures, disbursing funds to beneficiaries, and maintaining project accounts, but only after INE cleared each step. This process led to much duplication of effort during ODS II, as well as unnecessarily long lead times for final approvals and disbursement.

In 2001 the MPMF changed its strategic planning from an agency-driven to a country-driven approach. The National Ozone Unit in each country (e.g., the OPU in Mexico) thus determined which industrial sector would be assigned to each of the four implementing agencies. By the end of 2002, the OPU -now transferred from INE to the Secretariat of the Environment and Natural Resources (*Secretaría de Ambiente y Recursos Naturales*, or SEMARNAT-, assigned the industrial aerosols, sterilization, and chillers sectors to the Bank. Even though the Bank helped the country eliminate ODS consumption in the MAC sector, this was done before the sectors were assigned to the Implementing Agencies (IA).

### *ODS Consumption and Production*

Table 2 below shows yearly **consumption**<sup>3</sup> of ODS at time of project preparation (from 1995 to 1997) by type of chemical. Consumption of Annex A, Group I substances (CFC-11, CFC-12, CFC-113, and CFC-114) was approximately 4,858 MT in 1995 and 4157.23 in 1997. Corresponding figures for Annex A, Group II substances (halons) were 284.6 MT in 1997 and for Annex B, Group III substances (1,1,1 TCA or MCF), 1,360 MT in 1995 (equivalent to 135.83 ODP tonnes).<sup>4</sup>

**Table 2. Annual consumption of ODS in Mexico, 1995–2000, in ODP tonnes**

Year	Ozone Depleting Substance (Annex and Group)				
	Annex A Group I CFCs	Annex A Group II Halons	Annex B Group II CTC	Annex B Group III TCA	Annex E MeBr
<b>1995</b>	4858.66	0.0	0.0	135.83	1438.32
<b>1996</b>	4858.76	89.1	0.0	122.60	750.60
<b>1997</b>	4157.23	284.6	0.0	107.98	1126.80
<b>1998</b>	3482.93	212.8	0.0	76.38	1207.49
<b>1999</b>	2837.90	141.0	0.0	54.21	652.26
<b>2000</b>	3059.53	230.4	0.0	38.60	867.00
<b>Baseline years</b>	<b>1995–1997</b>	<b>1995–1997</b>	<b>1998–2000</b>	<b>1998–2000</b>	<b>1995–1998</b>
<b>Baseline consumption</b> <sup>(1)</sup>	4,624.89	124.6	0.0	56.40	1,130.80

Notes:

<sup>(1)</sup> Baseline consumption is estimated as the average consumption for the baseline years.

Source: Official reports from Mexico to the Ozone Secretariat ([www.ozone.unep.org](http://www.ozone.unep.org))

By 1995 CFC-11, CFC-12, and HCFC-22 were **produced** in Mexico only by Quimobásicos S.A. de C.V. of Monterrey. DuPont ceased production in its two plants at

<sup>3</sup> Consumption, as defined by Article 1 of the Montreal Protocol, means production plus imports minus exports of controlled substances.

<sup>4</sup> The ODP for TCA is 0.1. Table 2 shows TCA consumption in ODP tonnes.

the end of 1995. Combined production of CFC-11/12 for all plants in 1995 was 15,737 MT, of which 70 percent was exported. Quimobásicos, which was owned 51 percent by the government and 49 percent by Allied Signal, had a combined production capacity of CFC-11/12 of 12,000 MT. HCFC-22 was produced in a separate production line. Plans were to continue producing for currently viable export and domestic markets while considering applying to the MPMF for compensation for an accelerated shutdown. However, total country consumption of ODS was reduced significantly through regulation of the production sector in the early 1990s. Consumption of carbon tetrachloride in 1995 was 20,000 MT, almost all as feedstock for CFC production.<sup>5</sup> PEMEX produced 11,000 MT of the required CTC, while the remainder was imported. All CFC-113, -114, and -115 (120 MT total in 1995) was imported.

Of the nearly 5,000 ODP tonnes consumed in 1995, 3,247 (65 percent of the total) were consumed by the refrigeration and air conditioning sub-sector. Aerosols consumed 3 percent, foaming agents 15 percent, halons 5 percent, and solvents 10 percent. Miscellaneous sectors used the remaining 2 percent of the total. These figures demonstrate the progress made from factory conversions. By 1995 air conditioning and commercial refrigeration use and servicing were the predominant remaining consumers by sectors of application.

## **6.2 Original Global Environmental Objectives (GEO) and Key Indicators (as Approved)**

The objectives of ODS III, as originally approved, were (a) to support Mexico's program to phase out ODS consumption through technical and technological assistance and (b) to strengthen the institutional framework in Mexico to identify, prepare, evaluate, and administer sub-projects.

The original project indicators used by the Bank to monitor performance were (a) ODP to be phased out (b) disbursements, (c) time to signing subgrant agreement, (d) time to first disbursement, (e) cost effectiveness, (f) time to physical completion, and (g) time to financial completion. Information on these indicators is included in the Project Completion Reports prepared by the Bank and the GOM and submitted to the MPMF Secretariat after each subproject is completed. Even though information on these indicators is monitored, the outcome indicators were modified in 2002 to resemble more properly the changes brought about by the country-driven approach developed by the MPMF.

## **6.3 Revised GEO and Key Indicators (as Approved by Original Approving Authority) and Reasons/Justification**

The original objectives were not revised, but the project closing date was extended twice at the request of the GOM. The extensions followed the pace at which the industrial

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<sup>5</sup> Because feedstock uses are not considered consumption, the amount mentioned above is not included in table 2.

sector adopted the Montreal Protocol commitments. The first extension was from June 30, 2002, to June 30, 2004, and the second was until June 30, 2006. The first extension was requested to implement the chillers sub-project because the ExCom did not address the chillers sector until that time. The sub-project was carried out in two phases. The first phase finished in February 2004, and the second one started in April 2005.

The second extension was requested to address two innovative sub-sectors, sterilization and industrial aerosols. The MPMF approved the first of these sub-projects in July 2003 and the second in December 2003, for USD0.53 million. The implementation time frames varied to coincide with Mexico's Law of CFC Consumption. These sub-projects were the last consumption reduction activities of the Montreal Protocol in Mexico.

The World Bank is one of the four implementing agencies that channel funds from the MPMF to individual countries. The other agencies are UNDP, UNIDO, and UNEP. After 2001, it became usual practice for the grant recipient country to assign the different Montreal Protocol sectors to the different participating agencies. The Bank was assigned projects in the sterilization, aerosols, and chillers sub-sectors in 2002. The objective was then automatically adjusted to phase out ODS in these 3 industrial sectors.

The project's main indicators of success were (a) Mexico's overall compliance with Montreal Protocol control measures, particularly in sectors in which the Bank is involved, (b) implementation of a chillers sub-project, (c) zero CFC consumption in two main industrial aerosol companies in Mexico, DIMMEX and Tecnosol, by the end of FY06, and (d) zero CFC consumption in the sterilization sector by the end of FY06.

#### **6.4 Main Beneficiaries, Original and Revised**

The main beneficiaries of this grant were Mexican enterprises that were introducing ODS-reducing technologies approved by the Bank's Ozone Operations Resource Group (OORG) and the ExCom. Global benefits also resulted from the elimination of ODS, as depletion of stratospheric ozone could lead to significant increases in UV radiation reaching the Earth's surface. Increased UV radiation could in turn lead to adverse human and animal health effects, as well as ecosystem impacts. The ozone layer protects the biosphere from this type of radiation.

#### **6.5 Original Components (as Approved)**

To support Mexico's phase out schedule, a grant amount was calculated according to the country's ODS consumption levels from 1995 to 1997 and the thresholds per sector established by the Montreal Protocol and estimated demand growth. The OTF Grant Agreement in Mexico was signed for USD13 million. This corresponded to an indicative ceiling. As an implementation agency, the World Bank therefore could present individual sub-project proposals on behalf of the GOM for a combined maximum value of USD13 million. The level of funds requested could be much lower if ODS reduction was more effective than originally planned, for example, because of Montreal Protocol policies,

government regulations, market conditions, or new cost-effective technologies. This indeed happened, as will be discussed below.

The project had two components: (a) an investment component to provide grants to private or public firms to help them switch from ODS to non-ODS technologies and (b) a technical assistance component to supplement NAFIN’s technical capabilities in ODS-related sub-project technical review and supervision. Project preparation resources were to be requested by and channeled to NAFIN. International technical consultants for sub-project preparation were contracted directly by the Bank, in consultation with NAFIN, and financed through the Montreal Protocol Mexico project preparation budget.

The Grant Agreement did not specify which sectors the World Bank should be involved in. It specified only that a maximum of USD13 million could be used for the project. Table 3 shows the distribution of notional allocations by component.

**Table 3. Estimated project costs and grant proceeds**

<b>Component</b>	<b>Amount of OTF grant allocated (USD)</b>
1. Goods, works, and services	12,570,000
2. Technical assistance/recipient’s fee and travel	430,000
<b>Total estimated project costs</b>	<b>13,000,000</b>

## 6.6 Revised Components

Component design was not changed, but allocations by component were adjusted after MPMF’s approval as follows:

**Table 4. Actual project costs and grant proceeds**

<b>Component</b>	<b>Amount of OTF grant allocated (USD)</b>
1. Goods, works, and services	5,487,282
2. Technical assistance/recipient’s fee and travel	231,442
<b>Total funds approved by MPMF</b>	<b>5,728,724</b>

Therefore, the total funds approved by MPMF for the country totaled USD5.7 million. This became the final project cost, replacing the indicative USD13 million from above. Approximately USD6.3 million of the notional allocation were not requested to the MPMF because, first, the portfolio of projects initially identified was strongly linked to final users in the refrigeration sector. By 2001 this sector was still not eligible for funding under the MPMF and many companies had already switched to ODS-free technologies on their own. Second, there are four implementing agencies preparing projects in Mexico

and competing for MPMF resources. The NOU was in charge of coordinating activities among the different agencies. Finally, after 2002, the Bank was assigned to work in the sterilization, solvents, and chillers sectors. These three sectors were relatively small in terms of ODS consumption as well as very difficult to deal with due to the number of existing companies within each sector. The Bank succeeded in helping the country eliminate consumption of ODS in all of these sectors by developing innovative solutions that are currently being used worldwide.

#### 6.6.1. Component 1 – Goods, works and services

As part of the investment component (component 1 in table 4 above), the MPMF approved five projects in four sub-sectors. These projects were (a) technology conversion in two MAC companies, Airtemp and Climas de México, (b) the sterilization group project to replace CFC-12 technology-based sterilization equipment with alternative technologies in the hospital medical sterilization sector, (c) industrial solvents, and (d) the Mexico chiller concessional lending pilot project (two phases).

Table 5 shows the funds approved by the MPMF for each of these industrial sectors. The only sector with less than 100% disbursement is sterilization. This was because the non-ODS sterilization machines purchased cost slightly less than estimated. The US\$ 22,568 undisbursed were returned to the MPMF.

**Table 5. Funding and ODP phase out by sub-sector, in US dollars**

Sub-sector	Approved funding	Total funds disbursed	Approved ODP phase out	ODP phase out achieved
Mobile air conditioning	4,011,242	4,011,242	172.52	172.52
Sterilization	288,700	266,132	14.74	19.95
Aerosols	252,340	252,340	57.30	57.30
Chillers	935,000	935,000	5.00	7.80 <sup>(1)</sup>
<b>Total</b>	<b>5,487,282</b>	<b>5,464,714</b>	<b>244.32</b>	<b>252.12</b>

Notes:

<sup>(1)</sup> The chillers project as approved by the MPMF Secretariat has an approved phase out of 5.0 ODP tonnes. The initial target was to replace 20 chillers in two phases. Because a revolving fund was created using the funds approved by the MPMF plus another USD0.7 million from the counterpart, the project surpassed its expectations. By the end of 2004, the date of the PCR for Phase I, 13 chillers had been replaced, with a combined phase out of 7.8 ODP tonnes and 100 percent recovery rate of the fund. By the end of 2005, 19 chillers had been replaced with a combined phase out of 12.1 ODP tons. Phase II started in early 2006.

A detailed description of each of these industrial sectors follows below.

#### *MAC Sub-sector*

The MPMF approved two sub-projects in this sub-sector, Climas de México and Airtemp, for a total amount of USD4 million. The combined phase out estimated for this sub-sector was 172.52 ODP tonnes, as shown in table 6 below.

**Table 6. Funding and ODP phase out in the MAC sub-sector**

Sub-sector	Approved funding	Total funds disbursed	Achieved ODP phase out	Cost effectiveness
Climas de México	2,359,812	2,359,812	110.52 <sup>(1)</sup>	21.35 <sup>(2)</sup>
Airtemp	1,651,430	1,651,430	60.11 <sup>(3)</sup>	27.51 <sup>(4)</sup>
<b>Total</b>	<b>4,011,242</b>	<b>4,011,242</b>	<b>172.52</b>	<b>23.25</b>

Notes:

<sup>(1)</sup> ODS phase out for MAC projects is calculated indirectly. The ODP phase out for this project was estimated as an average charge of 1.1 kg of CFC-12 per condenser, plus 2 kg of servicing in an automobile's life. This methodology estimated that 110.5 ODP tonnes of CFC-12 would be eliminated, based on an expected production of 35,650 condensers in 1997.

<sup>(2)</sup> Cost effectiveness is calculated based on the indirect ODP phase out.

<sup>(3)</sup> In the 3 years prior to the project, an average of 54,647 condenser units were produced at Airtemp. Assuming an average consumption of 1.1 kg of CFC-12 per unit, the indirect phase out of CFC-12 is 60.1 ODP tonnes. The project initially presented to the MPMF assumed 3.1 kg of CFC-12 per unit, for an estimated phase out of 162 ODP tonnes. The former phase out number was the one approved.

<sup>(4)</sup> Cost effectiveness is calculated based on the indirect 60 ODP tonnes phased out.

Climas de México. The project at Climas de México, the largest MAC producer in the country, was approved in March 1998 during the 24<sup>th</sup> meeting of the ExCom. The objective of this project was to convert the process of producing CFC-12 air conditioning units. This included converting condensers, hoses, fittings, and assembly lines to HFC-134a-compatible technologies such as the manufacture of parallel flow condensers, hoses and specific fittings. The project was completed in 20 months.

The project consisted of changing the tube and fin condenser to a parallel flow design that would require (a) a new multi-flow-tube cutting system and a fin machine for manufacturing the corrugated fins, (b) a Nocolok furnace brazing process, in which nitrogen gas is applied continuously and a non corrosive flux is utilized to effect proper brazing, (c) an aqueous spray washer and drier system and a waste water treatment system, and (d) technology transfer and assistance, product performance testing, training, and consultant services.

Even though the project successfully replaced CFC-12 tube and fin condensers with R-134a parallel flow technology, a problem arose that should be studied closely for future MAC projects. Funding constraints forced the company to make business decisions based strictly on the lowest cost and acquire equipment from different suppliers according to the lowest quotations. Two different suppliers were selected for the fin machine and the assembly machine. Integrating the two machines proved less effective than acquiring both machines from the same supplier. Although the machine is now functioning properly, it is not performing at 100 percent. Therefore, it is recommended that funding for parallel flow technology be allocated not only on the basis of cost, but also on the basis of technological factors that ensure the most effective production of R-134a MAC units in a particular enterprise.

On completion of the Climas de México project, almost all MAC manufacturing companies in Mexico had adopted R-134a technology. Only Airtemp in Mérida

continued to produce condensers that are used with CFC-12. The World Bank submitted a project to the MPMF in 2001 to eliminate the use of ODS in Airtemp to ensure the entire sector phased out the use of CFCs.

Airtemp. The project at Airtemp was approved in October 2000, during the 34<sup>th</sup> meeting of the ExCom. The objective of this project was to assist the company in acquiring all necessary equipment to convert its production of R-134a and completely phase out CFC-12 from its MAC units. This project was very important in Mexico for the following reasons:

- a. **It ensured complete transformation of the MAC sector.** Because Climas de México and Armas have already acquired R-134a technology, Airtemp was the only significant domestic MAC manufacturing firm left in Mexico that produced CFC-12 MAC systems and condensers. By acquiring the Cab (Nocolok) technology proposed in the project document, the MPMF ensured that the company switched its entire production of MAC units away from CFC-12. Upon receiving the grant, the company committed itself to producing only R-134a condensers. All CFC-12-based equipment was dismantled and destroyed.
- b. **It ensured equity in the MAC sector.** As mentioned before, Climas de México and Airtemp are the two largest national producers of MAC units. Existing data indicated that Airtemp produced about 5 times as many MAC units as Climas de México in 1999. Climas received about USD2.3 million from the MPMF to acquire R-134a parallel flow technology. Airtemp demonstrated the same commitment as Climas de México to phase out CFC-12 and sought funding to remain competitive in the market.

The Airtemp project was completed successfully on time. In addition to technology conversions in the MAC sector, the project supported the preparation and approval of a norm which, banned the production of CFC-based MAC compressors. This norm entered into force in May 2004.

#### *Sterilization Sub-sector*

The sterilization group project was approved during the 40<sup>th</sup> meeting of the ExCom, with the objective of providing incentives for hospitals in Mexico to replace their CFC-12/EtO machines. The project was designed as a Terminal Umbrella Project, and an MPMF grant in the amount of USD886,600 was initially requested to replace all existing CFC-12 EtO machines in the country at a cost effectiveness of USD60.15 per kg ODP. The MPMF approved USD288,700 to replace 14.5 ODP tonnes at a cost effectiveness of USD19.95 per kg ODP.

The GOM was given the flexibility to implement the project using the technology of its choice and to meet any additional costs involved. No further funding would be requested for the sterilant sector on the understanding that this would represent the total CFC phase out in the sector.

Although the project initially aimed to replace sterilizers in hospitals, two industrial sterilizers were included as the project advanced. Most of the hospitals initially identified as potential beneficiaries replaced their equipment on their own. Other sectors were explored because the project was a Terminal Umbrella Project, and no more funds would be available for the sterilant sector. Table 7 shows the beneficiaries of the project, including the ODP tonnes phased out.

**Table 7. Projects included under the sterilant component**

Company/hospital <sup>(1)</sup>	Total funds disbursed	ODP phase out achieved <sup>(2)</sup>	Cost effectiveness <sup>(3)</sup>
<b>Industrial sterilizers</b>			
Trokar S.A. de C.V.	49,650.00	11.986	19.95
Plásticos Profesionales S.A. de C.V.	22,978.57	0.686	
<b>Hospitals</b>			
Hospimed	25,787.53	0.950	
Asociación para evitar la ceguera	26,840.89	1.267	
CAMI	21,574.09	0.370	
Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE) – Hospital 20 de Noviembre	20,138.65	1.267	19.95
ISSSTE – Hospital Dr. G. Castañeda	18,501.79	0.079	
ISSSTE – Hospital V. Gómez Farías	20,204.61	1.030	
ISSSTE – Hospital Gral. I. Zaragoza	21,222.97	0.528	
ISSSTE – Hospital Gral. Chihuahua	18,988.09	0.192	
ISSSTE – Hospital 1 de Octubre	20,245.37	1.584	
<b>Total</b>	266,132 <sup>(4)</sup>	<b>19.939</b>	<b>19.95</b>

*Notes:*

<sup>(1)</sup> This project initially had an approved ODP phase out of 14.74 ODP tonnes and targeted 17 hospitals around the country. The funds were released late by the MPMF, and by the time they were available, all of the original hospitals had replaced their equipment on their own. The companies and hospitals included as beneficiaries of the donation were identified at a later stage, once the funds were available.

<sup>(2)</sup> The original phase out, as approved by the MPMF, was 14.74 ODP tonnes. The actual phase out was 19.94 ODP tonnes, showing that the project performed better than expected.

<sup>(3)</sup> The original cost effectiveness used to estimate the funds available for the sector was USD19.95 per kg ODS. The actual cost effectiveness was USD13.35 per kg ODS. The higher cost effectiveness was a result of the higher-than-expected ODS phase out.

<sup>(4)</sup> The MPMF initially approved USD288,700, but only USD266,132 was disbursed. The difference of USD22,568

As mentioned before, the MPMF approved USD288,700 for this. Because not all funds were used, USD22,567 was returned to the MPMF (USD18,354 from the ISSSTE sub-project and USD4,213 from CEMEV). This difference was a result of the ISSSTE purchasing less expensive equipment than initially estimated<sup>6</sup>.

<sup>6</sup> In the case of ISSSTE (six hospitals), the chosen technology was low-temperature steam formaldehyde sterilization.

The project was completed on time with no significant problems because all equipment purchased was off the shelf. The technology most often chosen was 100 percent ethylene oxide (EtO). Following Montreal Protocol rules, baseline equipment was destroyed in all cases. This project eliminated consumption of ODS in the sterilization sector in Mexico.

#### *Industrial Aerosols Sub-sector*

The industrial aerosols project covered the replacement of CFC-11, -12, and -113 used as propellants and solvents for technical aerosols by non-ODS substances at the companies DIMMEX and TECNOSOL. The objective of the project was to eliminate the consumption of 26.81 MT of CFC-11, 4 MT of CFC-12, and 33.17 MT of CFC-113. These two enterprises were the remaining eligible companies identified in the sub-sector that still consumed ODS. The project was submitted as a Terminal Umbrella Project, which meant that no additional funds would be requested for this sub-sector. Moreover, the GOM committed to enact a regulation banning the use of CFCs in this sub-sector once the project was completed. The project was required to assist Mexico in complying with the 2005 and 2007 reductions control measures of the Montreal Protocol.

The project was approved by the MPMF during its 41<sup>st</sup> meeting in November 2003. Table 8 shows the funds and ODP phase out approved by the MPMF.

**Table 8. Projects included under the industrial aerosols component**

<b>Sub-sector</b>	<b>Total funds disbursed</b>	<b>ODP phase out achieved</b>	<b>Cost effectiveness</b>
DIMMEX	193,664	44.01	4.40
TECNOSOL	58,696	13.34	4.40
<b>Total</b>	<b>252,360</b>	<b>57.34</b>	<b>4.40</b>

The project was completed ahead of schedule. The original closing date was June 2006, but TECNOSOL was completed in May 2005 and DIMMEX in April 2006. With this project, consumption of ODS was eliminated in the industrial aerosol sector in Mexico

#### *Chillers Concessional Lending Pilot Project*

The objective of the chillers concessional lending pilot project was to promote the replacement of ODS-based chillers with newer ODS-free units that would be more efficient in electricity consumption terms. The project design was a win-win situation, as it brought about not only the elimination of CFCs, but also savings in energy consumption. The pilot project aimed to replace 20 chillers in Mexico in two phases, with 10 chillers replaced in each phase. This sub-project was carried out by the Trust Fund for Electrical Energy Savings (*Fideicomiso para el Ahorro de Energía Eléctrica*, or FIDE). The MPMF approved USD500,000 per phase. FIDE more than doubled the funds for the first phase, contributing USD700,000. Available funds were used to create a revolving fund from which chiller owners could borrow money to replace their ODS-based equipment. Energy efficiency gains from the new equipment allowed chiller owners to

repay the loan in less than 2 years using only the savings from electricity consumption. The innovative chillers replacement project established a robust methodology for chiller replacement projects that can be applied easily worldwide

As mentioned before, 10 chillers were scheduled to be replaced during the first phase, which concluded in February 2004.<sup>7</sup> Instead, replacement of 13 chillers was financed with the same level of MPMF resources as a result of increased building owner contributions. ODP eliminated during the first phase were 56 percent greater than expected: 7.8 tonnes instead of 5 tonnes. By the closing date of the first phase, the 13 sub-projects had been concluded. Chillers were replaced, baseline equipment was destroyed, and 100 percent of the loans were recovered.

Project design. Overall, the project design proved very successful, as there was great interest from chillers owners in participating and loans for the first phase were fully recovered. The main components of the project design are listed below.

- a. **Revolving fund.** A central part of this project was the design of a revolving fund for long-term chiller substitution. Funding from the Multilateral Fund was applied on a 50 percent basis to the cost of chillers below USD100,000. When the chiller cost exceeded USD100,000, the excess was financed entirely by the chiller owners. Chiller owners were offered the following financial conditions:
  - (i) Fixed repayment period of 3 years
  - (ii) Loans either in USD or units of investment (UDI), inflation-adjusted monetary units updated daily based on the consumer price index. Loans in USD were either at 0 percent interest for chillers up to 20 years old or 2 percent interest for chillers over 20 years old. Loans in UDI were at 0 percent interest.

FIDE developed evaluation and qualification criteria to prioritize the most cost-effective and efficient proposals and to share risks with chiller suppliers and owners. FIDE received 18 bids and pre-selected the 12 best projects. These 12 projects were further assessed based on verification of potential energy savings using a proven methodology and a financial evaluation of the building owners.

Repayment rates were highly satisfactory, with delays in only one case. All the funds were recovered by the close of the first phase.

- b. **Verification measurements.** To verify the initial energy savings estimates provided by the bidders, the performance levels of the existing chillers were measured. An international auditing company verified potential energy savings. In-situ measurements were taken both before and after chiller replacement to

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<sup>7</sup> Although the project was considered completed by February 2004, the funds used to replace the initial 10 chillers were fully recovered and FIDE is still using these funds to replace additional chillers. By July 2006 19 chillers had been replaced in Mexico using these funds.

assess the estimated energy savings. Bidding procedures stipulated that when the predicted energy savings for a project were more than 15 percent greater than the actual savings, a penalty should be incurred on the remaining 15 percent of the contract value.

Measurements were made using the well-established temperature-dependent model developed by the Joint Center for Energy Management of the University of Colorado. Based on the results of the in-situ performance tests, the bidders adjusted the potential energy savings on the chillers to reflect the verified levels. Similar in-situ verification measurements were carried out on 10 new replacement Chillers using the same methodology.

The results of the in-situ tests on the new chillers indicated that the actual savings on all 12 projects evaluated were within 15 percent of the predicted savings or higher than the predicted savings. Overall, estimated energy savings were 5.4 million kilowatt-hours (kWh)/year, while verified energy savings were 8.0 million kWh/year.

- c. **Owner contribution.** According to the project design, the costs of freight and installation of the new chillers would amount to 13 percent of the total project costs and be provided by the building owner. Because the building owners' counterpart contribution was included as one of the evaluation and qualifying criteria in the bidding process, it was increased from 13 percent to 34.8 percent of the original project costs

Lessons learned. The main lesson learned from the chillers project is that it is feasible to design a revolving fund that is sustainable over time and that can help speed the replacement of chillers. Other lessons learned are listed below.

- a. The revolving fund design is easy to implement and can be easily replicated in other countries. It efficiently replaced a significant number of chillers with a relatively small budget.
- b. The procedures developed to measure and verify electricity savings was a key element to guarantee that chiller producers offered the best products and stood behind them.
- c. Loan conditions both in units of investment (i.e., an inflation-adjusted monetary unit updated daily based on the consumer price index) and USD were attractive to building owners, proving that a credit program in this sector is feasible.
- d. CFC losses (leaks) were much higher than anticipated. In one extreme case, the old chiller was supposed to contain 240 kg of R-11, but only 40 kg were recovered.

### 6.6.2. Technical assistance component

Regarding the technical assistance component, expected funds at the beginning of the project were USD430,000, but only USD231,442 were approved by the MPMF. This difference occurs since funds for technical assistance were approved *pari passu* to the funds approved per subproject under the investment component. Since the Bank's participation in this project was restricted to four industrial subsectors, the funds for technical assistance were lower than expected. Nonetheless, the project effectively contributed to the institutional strengthening of SEMARNAT and NAFIN. While SEMARNAT gained considerable experience in negotiation techniques at the international level and a better understanding of the mechanisms of several agencies of the United Nations, NAFIN gained extensive capacity on project management and the Bank's procurement and financial management procedures

### **6.7 Other Significant Changes**

Not applicable

## **7. Key Factors Affecting Implementation and Outcomes**

### **7.1 Project Preparation, Design and Quality at Entry**

*(including whether lessons of earlier operations were taken into account, risks and their mitigations identified, and adequacy of participatory processes, as applicable)*

Building on lessons from ODS II, and to streamline sub-project processing, NAFIN was appointed as sole counterpart executing and financial agency for ODS III. During ODS II, NAFIN was responsible for sub-project preparation, procurement, and financial management of the project, but INE's clearance was needed at each step of the process. This process led to much duplication of effort and unnecessarily long lead times. During ODS III, the arrangement of appointing NAFIN as sole executing and financial agency worked better as a level of bureaucracy was removed. Capacity was built within NAFIN to support the identification, preparation and supervision of projects.

To support Mexico's phase out schedule, a grant amount was calculated according to the country's ODS baseline consumption levels and the thresholds per sector established by the Montreal Protocol. The OTF Grant Agreement with Mexico was signed for USD13 million, which corresponded to an indicative ceiling. This is common practice for Montreal Protocol operations. In 2002, following a worldwide policy from MPMF, GOM clearly defined which industrial sectors to assign to the different Implementing Agencies. The Bank worked on the sterilant and industrial aerosols sectors. In addition, the Bank was assigned to work in the chillers sub-sector, an important component of the refrigeration sector. This approach proved very successful and ODS phase out was achieved at lower cost efficiencies than expected. Five projects in four different industrial sectors for a total amount of USD5.5 million were approved by the MPMF.

## **7.2 Implementation**

*(including any project changes/restructuring, mid-term review, Project at risk status, and actions taken, as applicable)*

The GOM has shown a strong commitment to adhere to its Montreal Protocol phase out schedule. The GOM carried out different activities in connection with the diffusion of ozone layer depletion issues. Additionally, the GOM complied with the revised Montreal Protocol by committing to (a) freezing 1999 CFC consumption at 1996 consumption levels, (b) reducing CFC consumption by 50 percent by 2005, (c) reducing CFC consumption by an additional 35 percent by 2007, and (d) phasing out CFC consumption by 2010.

The mid-term review (MTR) carried out on May 2001 concluded that, with regard to the investment component, the project had not performed as expected mainly because the portfolio of projects initially identified was strongly linked to final users in the refrigeration sector. By 2001 this sector was still not eligible for funding under the MPMF and, in addition, many companies switched to ODS-free technologies on their own. By MTR, the MPMF had approved a total of USD2.8 million for this component. Finally, the projects developed by MTR (i.e. chillers, sterilants) were in non-traditional sectors and have included innovative schemes such as soft loans and financing by equipment providers. These schemes had no precedent internationally and proved that the ODS III operation had significant contributions that can be applied in other MO operations. Regarding the technical assistance component, see section 6.6.2

Despite the issues related to the total funds approved for investment subprojects, by the end the project, the total funds approved had doubled to USD5.7 million. Most of the funds approved by the MPMF were used, as discussed in section 6.6 above.

## **7.3 Monitoring and Evaluation (M&E) Design, Implementation, and Utilization**

Performance indicators as originally designed, included ODP to be phased out, disbursement, cost effectiveness, and time needed to complete activities (signing sub-grant agreements, physical completion, and financial completion). Information on these indicators is included in the Project Completion Reports prepared by the Bank and the GOM and submitted to the MPMF Secretariat after each subproject is completed.

Because the individual sub-projects were not known at the time of project preparation and grant signing and the performance indicators were linked to the outcome (“ensure that Mexico meets its commitments with the MP”), the selected performance indicators were the approved and actual ODP phased out by each sub-project. Annex 1 lists these indicators and shows that targets were achieved ahead of time. In addition, Table 5 shows that the ODP phase out achieved was higher than the approved ODP phase out. With fewer resources used than originally approved, the project was more efficient than expected.

## **7.4 Safeguard and Fiduciary Compliance**

*(focusing on issues and their resolution, as applicable)*

ODPIII was rated as category B because no major environmental impacts or resettlement were expected. The only safeguard triggered was OD 4.01–Environmental Assessment. According to the Environmental Data Sheet for this project, sponsoring enterprises were responsible for meeting emission standards, preparing environmental impact assessments, (EIA) and obtaining environmental clearances as required by Mexican law and World Bank environmental guidelines. The OPU ensured that the sub-projects complied with these environmental requirements before they were officially submitted to the Bank for Ozone Operations Resource Group (OORG) approval. Because of the nature of these sub-projects, the impact was so negligible that only environmental data sheets, but no EIA, were required.

Grant funding was extended under the project to sub-projects to phase out ODS in all sectors for which the ExCom approved sector guidelines. Under these guidelines, the ExCom evaluates and approves replacement substances. All expected environmental impacts therefore were positive. The project dealt with existing enterprises and relatively small quantities of ODS. Safety issues that might have been associated with some of the substitute chemicals were addressed project by project.

Fiduciary compliance was ensured by working with a reputable government Financial Intermediary (NAFIN) that was in charge of all disbursements made under this project. NAFIN staff working on the project was trained both on Bank regulations and on the specific requirements associated with MP projects (eligibility and fiduciary issues). NAFIN staff was for instance invited to come to Washington once a year, to participate in annual FI workshops that are conducted by ENVGC. NAFIN also worked in close coordination with the project team, which included Procurement and Financial Management Specialists. Procurement and FM reviews were conducted on a periodic basis.

### **7.5 Post-completion Operation/Next Phase**

*(including transition arrangement to post-completion operation of investments financed by present operation, Operation & Maintenance arrangements, sustaining reforms and institutional capacity, and next phase/follow-up operation, if applicable)*

The MPMF finances incremental operational and capital costs for sub-projects. All equipment purchased was fully paid for each company (in some cases, firms had to contribute their own resources). Because incremental operational costs were covered during a transitional period, sustainability should not be an issue for any of the sub-projects. Sustainability of the project as a whole was also guaranteed by establishing a national legal framework (a law prohibiting the consumption of ODS) together with economic resources. Companies were given incentives to phase out ODS, and when ODS sectors were clear of ODS consumption, a norm prohibiting the consumption of these chemicals was passed to prevent new companies from coming into the market and resuming the use of these substances. Finally, regarding institutional capacity, SEMARNAT had strong ownership of the country program to eliminate CFCs. The fact

that Mexico has been in compliance with the Montreal Protocol is a good indicator that capacity is adequate at SEMARNAT.

## **8. Assessment of Outcomes**

### **8.1 Relevance of Objectives, Design, and Implementation**

*(to current country and global priorities, and Bank assistance strategy)*

The ODSIII objectives were in line with the Country Assistance Strategy (CAS). Most important, the project was developed at a time when Mexico needed the most assistance to meet its commitments to the Montreal Protocol. Under the Protocol, developing countries were expected to reduce their consumption of CFCs by 50 percent by 2005 and 85 percent by 2007. The project helped Mexico meet the 2005 quota by completely eliminating ODS consumption in three key sectors (aerosols, MAC, and sterilization). Mexico is now on its way to meeting the 2007 target, as described in the following section.

### **8.2 Achievement of Global Environment Objectives**

*(including brief discussion of causal linkages between outputs and outcomes, with details on outputs in Annex 4)*

Project success is deemed **satisfactory**, as measured by three main indicators. First, the fundamental objective of the project was to ensure that Mexico could meet its Montreal Protocol targets to phase out ODS by 2010. The OTF Grant was established to ensure that Mexico's CFC consumption decreased from a baseline of 4,624.89 tonnes to less than 2,312.44 tonnes by 2005, a 50 percent drop in CFC consumption, and this target was met. Second, the results of the individual sub-projects targeted by the World Bank were highly satisfactory. Third, the project built institutional capacity to bring long-term benefits to Mexico, guaranteeing sustainability.

#### *Mexico and its Montreal Protocol Obligations*

Data on ODS consumption in Mexico have been very encouraging since 1994 as a result of the government's commitment to comply with the Montreal Protocol. Consumption of ODS has decreased consistently over time, as seen in table 9 below. The Montreal Protocol called for consumption of CFCs not to exceed 2,312.44 MT in 2005. In that year, CFC consumption in Mexico was 30 percent below this quota, at 1,604.02 MT.

The Montreal Protocol phase out commitment established three main reduction targets: the 1999 ODS consumption freeze (national average consumption 1995–1997), a 50 percent reduction in ODS consumption from a 1999 freeze level by 2005, and a complete phase out by 2010. Mexico went beyond simply freezing its level of ODS consumption by 1999. Consumption that year was significantly lower than the 1996 consumption level, close to the 50 percent reduction required by 2005.

**Table 9. Annual consumption of ODS in Mexico from 1986 to 2005, in ODP tonnes**

Year	Ozone depleting substances <sup>(*)</sup> (Annex and Group)					
	Annex A Group I CFCs	Annex A Group II Halons	Annex B Group I	Annex B Group II CTC	Annex B Group III TCA	Annex E MeBr
<b>1986</b>	8,818.20	116.7				
<b>1989</b>	9,223.30	892.8	0.50	18,409.600	1.350	0
<b>1990</b>	12,037.20	2,769.6	4.00	6,551.600	0	0
<b>1991</b>	10,290.72	2,777.6	0	2,956.800	18.890	237.858
<b>1992</b>	8,512.78	1,690.2	0	602.800	11.480	465.264
<b>1993</b>	9,198.16	1,425.5	53.70	525.800	49.210	1,268.352
<b>1994</b>	9,652.00	1,122.0	2.60	0	16.320	3,252.600
<b>1995</b>	4,858.66	0.0	0.80	0	135.830	1,438.320
<b>1996</b>	4,858.76	89.1	0	0	122.600	750.600
<b>1997</b>	4,157.23	284.6	0.02	0	107.983	1,126.800
<b>1998</b>	3,482.93	212.8	0	0	76.380	1,207.494
<b>1999</b>	2,837.90	141.0	0	0	54.210	652.260
<b>2000</b>	3,059.53	230.4	0	0	38.600	867.000
<b>2001</b>	2,223.94	140.4	0	0	30.000	1,100.124
<b>2002</b>	1,946.73	147.3	0	0.825	0	1,067.490
<b>2003</b>	1,983.15	103.8	0	0	0	967.950
<b>2004</b>	3,208.44	105.6	0	0	0	987.456
<b>2005</b>	1,604.02	52.8	0	89.540	0	891.120

Note:

(\*) There is no consumption of Annex C Groups II and III ODS in Mexico. Annex B, Group I was phased out in 1998.

Under the agreement with the Montreal Protocol, in 2005 Mexico's consumption of CFCs was not to exceed 2,312.44 ODP tonnes, consumption of halons was not to exceed 62.28 ODP tonnes, consumption of TCA was not to exceed 39.48 ODP tonnes, and consumption of methyl bromide was not to exceed 904.64 ODP tonnes. Table 10 shows that Mexico met all these quotas.

The projects in which the World Bank was involved have been successful in contributing to this ODS phase out targets. While market forces and government intervention have also determined this trend, the projects implemented by the World Bank and other agencies ensured that the conversion to non-ODS technologies was sustainable and prevented a recurrence of ODS use over the long term. Even though the Bank helped the country eliminate 252.12 ODP tonnes (5% of the baseline consumption), this was done in non-traditional sectors, where innovative solutions had to be developed to guarantee the success of the project. The schemes developed had no precedent at the international level and are currently being applied worldwide in other MP operations.

**Table 10. Consumption of ODS in Mexico in 2005 in ODP tonnes**

Description	Ozone Depleting Substance <sup>(*)</sup> (Annex and Group)			
	Annex A Group I CFCs	Annex A Group II Halons	Annex B Group III TCA	Annex E MeBr
Maximum allowed consumption during 2005	2,312.44	62.28	39.48	904.64
Actual consumption during 2005	1,604.02	52.80	0.00	891.12
Percentage below the established quota	31%	15%	100%	1%

*Success of Sub-projects*

The Ozone Projects Trust Fund Grant was successful in contributing to the elimination of ODS use in Mexico. The four sectors in which the Bank participated met their expectations regarding ODS phase out. In particular, ODS consumption was completely eliminated from the aerosols, sterilization, and MAC sub-sectors. Table 11 shows the combined impact of the Bank's intervention in the four sectors.

**Table 11. Funding and ODP phase out by sub-sector**

Sub-sector	Approved ODP phase out	Actual ODP phase out
Mobile air conditioning	172.52	172.52
Sterilization	14.50	14.50
Aerosols	57.30	57.30
Chillers	5.00	7.80
<b>Total</b>	<b>249.32</b>	<b>252.12</b>

**8.3 Efficiency**

*(Net Present Value/Economic Rate of Return, cost effectiveness, e.g., unit rate norms, least cost and comparisons. and Financial Rate of Return)*

Montreal Protocol projects do not require a net present value (NPV) or economic rate of return (ERR) calculation. The main criterion that determines the level of eligible funding for these projects is the estimated ODS reduction expressed in kilograms multiplied by pre-determined thresholds for each sector. Rigid foam projects, for example, are eligible for USD7.83 per kg of ODP phased out. In the MAC sub-sector, thresholds do not apply because all ODS phase out is indirect. Table 12 shows the final indicative cost effectiveness.

**Table 12. Funding and ODP phase out by sub-sector**

<b>Sub-sector</b>	<b>Funds disbursed</b>	<b>Approved ODP phase out</b>	<b>Cost effectiveness</b>
Mobile air conditioning	4,011,242	172.52	23.25
Sterilization	266,132	14.50	18.35
Aerosols	252,340	57.30	4.40
Chillers	935,000	7.80	n/a <sup>(1)</sup>
<b>Total</b>	<b>5,464,714</b>	<b>252.12</b>	<b>21.68</b>

Notes:

<sup>(1)</sup> The cost effectiveness for the chillers project does not apply because the funds from the first phase are still being used in the revolving fund and the second phase of the project started recently.

#### **8.4 Justification of Overall Outcome Rating**

*(combining relevance, achievement of GEO, and efficiency)*

Rating: Satisfactory

The overall performance of ODS III is rated satisfactory for five reasons. First, the GEO was achieved because the country has been meeting its consumption reduction commitments under the Montreal Protocol through a series of activities including the projects mentioned above in which the Bank was involved. Second, the project eliminated the consumption of ODS in the MAC, aerosols, and sterilization sectors. Third, the aerosols sub-project was useful in developing a law prohibiting the consumption of ODS in Mexico. Fourth, approved ODS phase out was achieved, and in the chillers and sterilization projects, exceeded. Finally, the chillers sub-component proved that it is feasible to design a revolving fund that is sustainable over time and that can speed the replacement of chillers. This innovative sub-project is being used as an example for all other operations worldwide.

#### **9. Assessment of Risk to Global Environment Outcome**

Rating: Low or negligible

The risk to the global environmental outcome is minimum; project sustainability is rated as likely. Mexico has shown a strong commitment to adhering to its Montreal Protocol obligations and should completely phase out ODS by 2010. The 2005 data show that the country has been meeting its obligations and is well on its way to meeting the 2010 deadline. The closing of the Quimobásicos CFC production plant in 2005 (with the technical support of UNIDO) is a strong indication that Mexico will meet its commitments. The terminal projects implemented by the World Bank (sterilants, aerosols, and MAC), by UNIDO (National CFC phase out plan and production closure),

and by UNDP (foams) addressed the remaining consumption in the country. In addition, the GOM has raised public awareness of the need to protect the ozone layer, and consumers are interested in purchasing non-ODS products. Companies that received MPMF funding had to dispose of their CFC equipment, and NAFIN and SEMARNAT supervised the destruction of that equipment. Finally, norms were passed prohibiting the consumption of ODS in the MAC and aerosols sectors.

## **10. Assessment of Bank and Borrower Performance**

*(relating to design, implementation and outcome issues)*

### **10.1 Bank**

#### **(a) Bank Performance in Ensuring Quality at Entry**

*(i.e., performance through lending phase)*

Rating: Satisfactory

Throughout the project life, Bank staff worked closely with NAFIN and SEMARNAT to ensure proper identification, preparation, and implementation of sub-projects. Local consultants were hired for project preparation and implementation. The Bank also provided valuable support to the GOM in the strategic policy design and during its negotiations at the ExCom meetings and hired highly specialized consultants to support the GOM in key sectors.

#### **(b) Quality of Supervision**

*(including of fiduciary and safeguards policies)*

Rating: Satisfactory

Supervision was adequate, as Bank staff worked closely with NAFIN and SEMARNAT to conduct periodic supervision missions during the project. The Bank visited the companies with projects under implementation and provided guidance and technical support. At the same time, NAFIN supervised and assisted the companies throughout implementation. Continual reports, including Business Plans, Progress Reports, and Project Completion Reports, were prepared and submitted to the Bank and the MPMF Secretariat. The MTR was carried out on May 2001, slightly over one year before the initial closing date of the project (June 30, 2002). The MTR was carried out relatively late because, first, the Grant Agreement became effective on August 1998, 5 months after its signature, and second, because it was common practice to extend MP operations for which there were subprojects still active. The main results from the MTR are described in section 7.2 above.

To mainstream Montreal Protocol operations, Project Supervision Reports (PSR), which were not required earlier, were introduced in FY00. Moreover, during the first phase of the project, it was not mandatory to elaborate aides mémoire after preparation and supervision missions, but this was done.

With regard to safeguard policies, the MOD points out that “sponsoring enterprises are responsible for meeting emissions standards, preparing impact statements, and obtaining environmental clearances as required by Mexico law, and consistent with World Bank environmental guidelines.” Environmental screenings were always included in project documents sent to the MPMF for approval. Because project documents were typically prepared in collaboration between NAFIN, SEMARNAT, and the Bank, they had to comply with Mexican laws and Bank environmental guidelines before being sent to the MPMF.

### **(c) Justification of Rating for Overall Bank Performance**

Rating: Satisfactory

The project helped Mexico meet its ODS consumption commitments under the Montreal Protocol. ODS consumption was eliminated from the sub-sectors assigned to the Bank by the NOU, namely refrigeration (chillers and MAC), sterilization, and industrial aerosols. Innovative schemes, such as soft loans and financing by equipment providers, were developed to eliminate ODS in these sectors. These schemes had no precedent internationally and proved that the ODS III operation had significant contributions that can be applied in other MP operations. Supervision was adequate, with periodic supervision missions during the lifespan of the project—at least two supervision missions were carried out each year.

Finally, in terms of project specific activities, the chillers sub-project developed a robust methodology that is applicable worldwide. The objectives of the project were met in a timely manner.

## **10.2 Borrower**

*(Check here if the Government and Implementation Agency were the same or indistinguishable)*

### **(a) Government Performance**

Rating: Satisfactory

The GOM was responsible for identifying the sub-projects and industrial sectors that would request funding from the MPMF. With the support of the World Bank, UNDP, and other international agencies, the government established a clear strategy to create awareness of ozone depletion and prepare sub-projects in different industrial sectors. The GOM’s leadership and vision ensured that the program developed was appropriate to adhere to the ODS phase out schedule of the Montreal Protocol. Hence its performance is assessed as satisfactory.

### **(b) Implementing Agency or Agencies Performance**

Rating: Satisfactory

Implementing Agency: Nacional Financiera

NAFIN's role as implementing agency was satisfactory as the project documents prepared were done on time and were of high quality. In addition, supervision reports for ongoing projects were also of high quality and always submitted on time to the World Bank. The team at NAFIN worked very closely with the World Bank during the whole project. The logistics for Bank missions were prepared ahead of time by NAFIN for the World Bank, which made supervision easier.

### **(c) Justification of Rating for Overall Borrower Performance**

Rating: Satisfactory

The overall performance of the government during the project is assessed as satisfactory for the reasons mentioned above. The objectives of the grant were met, and Mexico is well on its way to phase out ODS completely by 2010.

## **11. Lessons Learned**

*(Both project-specific and wide general application)*

The project was successful because of the following main reasons:

- a. Mexico reduced its consumption of ODS by about 53% from 1998 to 2005. Consumption of ODS during 2005 was 30% below the allowed quota. These reductions exceeded the objectives of the Grant Agreement and have ensured that Mexico will adhere to its MP phase-out commitments.
- b. The World Bank implemented projects in Mexico phased out about 252 ODP tonnes. Consumption of ODS was eliminated from three key sectors: industrial aerosols, MAC, and sterilants.

The main lessons that can be drawn from this project are:

### Sectoral Approach

The project successfully contributed to eliminate consumption of ODS from four key sub-sectors: industrial aerosols, MAC, chillers, and sterilization. The sterilization and industrial aerosols sub-projects were designed as Terminal Umbrella Projects, and as such they were aimed at completely phasing out consumption of ODS in both these sectors. This approach proved very successful because it gave the country the flexibility to implement the project using the technology of its choice and the responsibility to meet any additional costs involved. As a result, the costs of eliminating ODS were lower than expected, making the cost effectiveness higher than initially estimated.

In addition, by enacting regulations prohibiting the consumption of ODS once these substances were phased out from a specific sector guarantees the sustainability of the project.

### Institutional strengthening

The project effectively contributed to the institutional strengthening of SEMARNAT and NAFIN. While the ozone unit gained considerable experience in negotiation techniques at the international level and a better understanding of the mechanisms of several agencies of the United Nations, NAFIN's gained extensive capacity on project management and the Bank's procurement and financial management procedures.

### Revolving fund, chillers sub-project

The main lesson learned from the chillers project is that it is feasible to design a revolving fund that is sustainable over time and that can help speed the replacement of chillers. Other lessons learned are listed below.

- a. The revolving fund design is easy to implement and can be easily replicated in other countries. It efficiently replaced a significant number of chillers with a relatively small budget.
- b. The procedures developed to measure and verify electricity savings was a key element to guarantee that chiller producers offered the best products and stood behind them.
- c. Loan conditions both in units of investment (i.e., an inflation-adjusted monetary unit updated daily based on the consumer price index) and USD were attractive to building owners, proving that a credit program in this sector is feasible.
- d. CFC losses (leaks) were much higher than anticipated. In one extreme case, the old chiller was supposed to contain 240 kg of R-11, but only 40 kg were recovered.

### MAC subsector

A problem arose while replacing tube and fin condensers for parallel flow technology that should be studied closely for future MAC projects. Funding constraints forced the company to make business decisions based strictly on the lowest cost and acquire equipment from different suppliers according to the lowest quotations. Two different suppliers were selected for the fin machine and the assembly machine. Integrating the two machines proved less effective than acquiring both machines from the same supplier. Although the machine is now functioning properly, it is not performing at 100 percent. Therefore, it is recommended that funding for parallel flow technology be allocated not only on the basis of cost, but also on the basis of technological factors that ensure the most effective production of R-134a MAC units in a particular enterprise.

## **12. Comments on Issues Raised by Borrower/Implementing Agencies/Partners**

### **(a) Borrower/implementing agencies**

#### Comments from NAFIN

Taking into consideration that the objective of the Grant was to support Mexico in its transition to non-ozone depleting technologies, it is safe to say the objective was achieved. The objective was met by providing funding to previously identified subprojects.

Funding was provided to four subprojects: elimination of ODS consumption in the production of air conditioning, industrial aerosols, sterilants sector, and cooling systems (chillers). These four subprojects were completed successfully.

Regarding the “elimination of ODS consumption in air conditioning sector” subproject, all funds were disbursed by May 2000. All funds available for this subproject were disbursed. The industrial aerosols subproject not only eliminated the amount of ODS established in the project report, but it completed the elimination ahead of schedule. All funds were also disbursed in this subproject. With respect to the sterilants subproject, new beneficiaries (different to the initially selected) were identified. Even with this change the project eliminated the consumption of ODS initially expected. Execution of the sterilant subproject was slower than expected, but the objectives of the subproject were still met on schedule. A total of 76% of the funds assigned to the sterilants subproject were disbursed. The funds not used were due to the fact that ISSSTE purchased equipment that was less expensive than initially estimated. This equipment was also eligible under the grant agreement. Finally, the first phase of the chillers subproject was finished before the project closing date. The second phase was recently started, but will remain active until the point that there are no companies available to replace equipment.

Regarding disbursements, NAFIN considers that all of them were carried on time, except those delays that may have existed due to the nature of the execution of the subproject. Finally, the funds approved by the ExCom were disbursed.

Taking into consideration the description above, it is clear that both the ICR and the project’s audit show that the execution, management, and financial aspects of the Grant were handled with high quality standards. This helped achieve the objectives and results expected from the implementation of the project.

#### Comments from SEMARNAT

In our opinion, the ICR is complete and it includes all the information of the execution of the projects carried out in Mexico. The project can be satisfactorily closed with this report.

The lessons learned of the project are:

1- Strategic planning of the execution of subprojects: Projects were correctly executed, without delays, providing appropriate engineering solutions, and without major mishaps thanks to the clear definition of objectives, time scales, and responsibilities in each stage of the project.

2- Supervision of subprojects: The key to successful implementation of the objectives of the project was the continuous monitoring of the status of subprojects.

3- Efficient and effective management of the projects resources: By managing resources effectively and efficiently once the subprojects were defined, the project was executed on schedule and without cost overruns.

The project faced the following difficulties:

1- Lack of inter-institutional agreements: Even though these were not the responsibility of the executing and implementing agencies, they translated into small delays in the execution of the project. These delays were solved by adopting a proactive attitude and by monitoring subprojects permanently in order to return to the original schedule.

2- Delay in the assignment of resources for the chillers project: This problem was solved thanks to the political will of the authorities at SEMARNAT, as well as the adjustments in the World Bank Work Plan submitted to the Montreal Protocol. These actions allowed the second stage of the chillers project to take place.

**(b) Co-financiers**

**(c) Other partners and stakeholders**  
(*e.g. NGOs/private sector/civil society*)

## **Annex 1. Results Framework Analysis**

### **Global Environment Objectives**

The objectives of ODS III, as originally approved, were (a) to support Mexico's program to phase out ODS consumption through technical and technological assistance and (b) to strengthen the institutional framework in Mexico to identify, prepare, evaluate, and administer sub-projects.

The original project indicators used by the Bank to monitor performance were (a) ODP to be phased out (b) disbursements, (c) time to signing subgrant agreement, (d) time to first disbursement, (e) cost effectiveness, (f) time to physical completion, and (g) time to financial completion. Information on these indicators is included in the Project Completion Reports prepared by the Bank and the GOM and submitted to the MPMF Secretariat after each subproject is completed. Even though information on these indicators is monitored, the outcome indicators were modified in 2002 to resemble more properly the changes brought about by the country-driven approach developed by the MPMF.

### **Revised Global Environment Objectives**

The original objectives were not revised, but the project closing date was extended twice at the request of the GOM. The extensions followed the pace at which the industrial sector adopted the Montreal Protocol commitments. The first extension was from June 30, 2002, to June 30, 2004, and the second was until June 30, 2006. The first extension was requested to implement the chillers sub-project because the ExCom did not address the chillers sector until that time. The sub-project was carried out in two phases. The first phase finished in February 2004, and the second one started in April 2005.

The second extension was requested to address two innovative sub-sectors, sterilization and industrial aerosols. The MPMF approved the first of these sub-projects in July 2003 and the second in December 2003, for USD0.53 million. The implementation time frames varied to coincide with Mexico's Law of CFC Consumption. These sub-projects were the last consumption reduction activities of the Montreal Protocol in Mexico.

The World Bank is one of the four implementing agencies that channel funds from the MPMF to individual countries. The other agencies are UNDP, UNIDO, and UNEP. After 2001, it became usual practice for the grant recipient country to assign the different Montreal Protocol sectors to the different participating agencies. The Bank was assigned projects in the sterilization, aerosols, and chillers sub-sectors in 2002. The objective was then automatically adjusted to phase out ODS in these 3 industrial sectors.

The project's main indicators of success were (a) Mexico's overall compliance with Montreal Protocol control measures, particularly in sectors in which the Bank is involved, (b) implementation of a chillers sub-project, (c) zero CFC consumption in two main industrial aerosol companies in Mexico, DIMMEX and Tecnosol, by the end of

FY06, and (d) zero CFC consumption in the sterilization sector by the end of FY06.

**(a) Baseline Values from Project Outcome Indicators/Date of Value (from Approval Documents)**

Indicator	Baseline value	Original target values (from approval documents)	Formally revised target values	Actual value achieved at completion of target years
<b>Indicator 1:</b>	Overall compliance of Mexico with Montreal Protocol control measures, particularly in sectors in which the Bank is involved			
Value (quantitative or qualitative)		Mexico meets its commitments under the Montreal Protocol		Consumption of ODS in 2005 is 30% below the established quota
Date achieved		06/29/1999		12/31/2005
Comments (incl. % achievement)				

**(b) Intermediate Outcome Indicator(s)**

Baseline Values from Project Outcome Indicators/Date of Value (from Approval Documents)				
Indicator	Baseline value	Original target values (from approval documents)	Formally revised target values	Actual value achieved at completion of target years
<b>Indicator 1:</b>	Implementation Chiller Sub-project			
Value (quantitative or qualitative)		10 chillers replaced		Phase I of chillers sub-project completed successfully. Results exceeded expectations: 19 chillers replaced instead of 10 originally planned; 100% recovery rate (revolving fund). Phase II began in 2005.
Date achieved		07/30/1999		06/30/2006
Comments (incl. % achievement)				

<b>Indicator 2 :</b>	Zero CFCs consumption by end of FY06 in two main industrial aerosols companies in Mexico: DIMEX and Tecnosol			
Value (quantitative or qualitative)	57.34 ODP tons consumed by these companies	Phase out consumption by June 2006		Phase out of CFC consumption from these companies achieved sooner than expected. TECNOSOL phased out CFC consumption at the end of FY05 and DIMMEX by February 2006
Date achieved		12/31/2006		02/28/2006
Comments (incl. % achievement)				
<b>Indicator 3 :</b>	Zero CFCs consumption in the sterilization sector by the end of FY06.			
Value (quantitative or qualitative)	14.5 ODP tons consumed in this sector	Phase out ODS consumption by June 2006		Phase out of CFC consumption from the sterilization sector achieved June 2006 with the replacement of equipment at ISSSTE
Date achieved		06/30/2006		06/30/2006
Comments (incl. % achievement)				

## Annex 2. Restructuring (if Any)

Restructuring Date(s)	Board Approved GEO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD M	Reason for Restructuring & Key Changes Made
		GEO	IP		

Not applicable

### Annex 3. Project Costs and Financing

#### (a) Project Cost by Component (in USD M equivalent)

Component	Appraisal estimate (USD M)	Actual/latest estimate (USD M)	Percentage of appraisal
SUBPROJECTS	12.60	5.50	43.65
AGENT FEES, ADMINISTRATION AND TA	0.40	0.20	50.00
<b>Total Baseline Cost</b>	<b>13.0</b>	<b>5.70</b>	
Physical Contingencies	0.0	0.0	0.0
Price Contingencies	0.0	0.0	0.0
<b>Total Project Costs</b>	<b>13.0</b>	<b>5.70</b>	
Project Preparation Facility (PPF)	0.0	0.0	0.0
Front-end fee IBRD	0.0	0.0	0.0
<b>Total Financing Required</b>	<b>13.0</b>	<b>5.70</b>	

#### (b) Financing

Source of funds	Type of co-financing	Appraisal estimate (USD M)	Actual/latest estimate (USD M)	Percentage of appraisal
BORR		0.0	0.7	
MP		13.0	5.7	

#### (c) Disbursement Profile


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## Annex 4. Outputs by Component

Funding and ODP phase out by sub-sector

<b>Sub-sector</b>	<b>Funds disbursed</b>	<b>Approved ODP phase out</b>	<b>Actual ODP phase out</b>	<b>Cost effectiveness</b>
Mobile air conditioning	4,011,242	172.52	172.52	23.25
Sterilization	266,132	14.74	19.95	18.35
Aerosols	252,340	57.30	57.30	4.40
Chillers	935,000	5.00	7.80	119.87
<b>Total</b>	<b>5,464,714</b>	<b>244.32</b>	<b>252.12</b>	<b>21.68</b>

See sections 6.5 and 8.3 for more detailed analysis of the outputs by component.

**Annex 5. Economic and Financial Analysis**  
(including Assumptions in the Analysis)

N/A. See section 8.3.

## Annex 6. Bank Lending and Implementation Support/Supervision Processes

### (a) Task Team Members

Name	Title	Unit	Responsibility/specialty
<b>Lending</b>			
<b>Supervision/ICR</b>			
Horacio Terraza	TTL	LCSEN	
Hernán M. González Figueroa	ET Consultant	LCSEN	
Roberto Gabriel Aiello	Technical Specialist	ENVCF	
<b>Supervision Missions</b>			
Date	Team Members		
March 16, 2006	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
November 7-11, 2005	Roberto Gabriel Aiello, ENVCF Hernán M. González Figueroa, LCSEN		
August 1-3, 2005	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
May 9-10, 2005	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
February 28, 2005	Roberto Gabriel Aiello, ENVCF		
November 11-12, 2004	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
April 12-16, 2004	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
December 8-10, 2003	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
May 8, 2003	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
January 17-20, 2003	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
July, 2002	Horacio Terraza, LCSEN Roberto Gabriel Aiello, ENVCF		
February 5-8, 2002	Horacio Terraza, Juan Lopez-Silva, LCSEN Ellen Tynan, ENVGM		
2001	Laura Tlaiye, Horacio Terraza, Juan Lopez-Silva, LCSEN Ellen Tynan, ENVGM		
2000	Laura Tlaiye, Horacio Terraza, LCSEN Monroy, Consultant		
2000	Laura Tlaiye, Horacio Terraza, LCSEN		

	Monroy, Consultant
1999	Laura Tlaiye. LCSEN

<b>(b) Ratings of Project Performance in ISR</b>				
No.	Date ISR archived	IP	GEO	Actual disbursements (USD M)
1	12/15/1999	Satisfactory	Satisfactory	2.93
2	06/28/2000	Satisfactory	Satisfactory	2.95
3	12/19/2000	Satisfactory	Satisfactory	2.95
4	06/27/2001	Satisfactory	Satisfactory	2.95
5	12/18/2001	Satisfactory	Satisfactory	3.95
6	06/14/2002	Satisfactory	Satisfactory	4.65
7	12/16/2002	Satisfactory	Satisfactory	4.65
8	06/06/2003	Satisfactory	Satisfactory	4.65
9	12/22/2003	Satisfactory	Satisfactory	4.65
10	06/08/2004	Satisfactory	Satisfactory	5.20
11	12/17/2004	Satisfactory	Satisfactory	5.20
12	05/04/2005		Satisfactory	5.20
13	09/03/2005		Satisfactory	5.72
14	06/01/2006		Satisfactory	5.72

<b>(c) Staff Time and Cost</b>		
<b>Stage of project cycle</b>	<b>Staff time and cost (Bank budget only)</b>	
	<b>No. of staff weeks</b>	<b>USD thousands (including travel and consultant costs)</b>
<b>Lending</b>		
FY97		47.11
FY98		15.85
FY99		0.00
FY00		0.00
FY01		0.00
FY02		0.00
FY03		0.00
FY04		0.00
FY05		0.00
FY06		0.00
FY07		0.00
<b>Total:</b>		<b>62.96</b>
<b>Supervision/ICR</b>		
FY97		0.00
FY98		11.12
FY99		78.65
FY00		71.29
FY01		123.59
FY02		96.61
FY03		92.83
FY04		85.82
FY05		43.18
FY06		50.14
FY07		22.65
<b>Total:</b>		<b>675.88</b>

**Annex 7. Detailed Ratings of Bank and Borrower Performance**

<b>Bank</b>	<b>Ratings</b>	<b>Borrower</b>	<b>Ratings</b>
Ensuring Quality at Entry:	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
<b>Overall Bank Performance:</b>	Satisfactory	<b>Overall Borrower Performance:</b>	Satisfactory

## **Annex 8. Summary of Borrower's ICR and/or Comments on Draft ICR**

### Comments by NAFIN

The ICR has been reviewed and we consider it contains all information related with the execution of the project. Additionally, it provides a clear synthesis about the project's background and achievements.

It is important to point out that NAFIN, as the Financial and Executing Agency for the project, is fully satisfied with the project achievements. The ICR shows that, not only the environmental targets were met, but in some cases these were surpassed. This can be translated into an efficient use of the resources, in particular in NAFIN's role as Financial and Executing Agency.

In addition, NAFIN considers that the ICR contains the data necessary to evaluate objectively each of the components of the Project, from planning to implementation to achievements. These data will allow future work to analyze the implementation mechanism, and if necessary, to replicate it in the planning structure of other projects in the same sector.

Finally, the Project shows, in a very general way but without losing the important details, the entire process followed to execute the project. In this sense, the ICR is a valuable resource to keep in the Grant's file.

**Annex 9. Comments of Co-financiers and Other Partners/Stakeholders (if any)**

## **Annex 10. List of Supporting Documents**

1. Aide memoires and project status reports (August 1998 - July 2005)
  2. Audit reports
  3. Business plans prepared by NAFIN/SEMARNAT and the World Bank Regional Team
  4. Comments from Beneficiary enterprises
  5. Financial and Procurement information from NAFIN
  6. Grant Agreement, Third Ozone Depleting Substances Phase Out in Mexico, World Bank, March 1998
  7. Memorandum to the vice-president, October 1997.
  8. Subgrant agreements, NAFIN and beneficiary companies
  9. Project Documents, prepared by NAFIN/SEMARNAT, beneficiary companies and the MP World Bank Regional Team.
  10. Project Completion Reports of each subproject, prepared by NAFIN/SEMARNAT
  11. Progress reports prepared by NAFIN
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