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Executive Committee of
the Multilateral Fund for the
Implementation of the Montreal Protocol
Twenty-sixth Meeting
Cairo, 11-13 November 1998

PROJECT PROPOSAL: CHILE

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

Several

- Montreal Protocol implementation program, Phase II, 2nd tranche World Bank

PROJECT EVALUATION SHEET CHILE

SECTOR: SEVERAL ODS use in sector (1997): 686 ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Titles:

(a) Montreal Protocol Implementation Program - Phase II, 2nd Tranche

Project Data	
	Montreal Protocol, Phase II
ODS phase-out (ODP tonnes)	270
Proposed project duration (months)	24
Incremental capital cost (US \$)	N/a
- including contingency (%)	N/a
Incremental operational cost (US \$)	N/a
Total project cost (US \$)	2,800,000
Local ownership (%)	N/a
Export component (%)	N/a
Amount requested (US \$) {Original}	2,800,000
{Revised}	N/a
Cost effectiveness (US \$/kg) (Overall)	10.37
National Coordinating Agency	CONAMA
Implementing Agency	The World Bank
Technical review completed?	N/a

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

PROJECT DESCRIPTION

(a) Montreal Protocol Implementation Program - Phase II, 2nd Tranche

1. This is a continuation (second tranche) of a project approved at the 19th Meeting that was the second phase of a project approved at the 7th Meeting.

2. The Program, as approved by the Executive Committee, was intended to test a competitive mechanism for allocating Multilateral Fund resources to beneficiary enterprises using auctions, expressed as dollars per kg of ODS reduced. Phase I (approved at the 7th Meeting) was approved at a level of US \$1.2 million of which US \$500,000 was intended for non-investment activities to enable a reduction of consumption. Overall, Phase I was to result in the reduction of Chile's consumption by 63 per cent from 714 MT to 364 MT.

3. Phase II, 1st Tranche is to be completed this year. The Executive Committee approved US \$1 million for Phase II, 1st Tranche. To date, two calls for bids for a total of US \$800,000 will result in reductions of 121 MT (in the domestic and commercial refrigeration sectors) once the projects are fully implemented. The cost-effectiveness of Phase II, 1st Tranche to-date is \$6.60/kg or 17% lower than the ceiling pledged in the project approved at the 19th Meeting. A third call for bids will allocate the remaining US \$200,000 of Phase II, 1st Tranche.

4. The objectives of Phase II, 2nd Tranche are to:

- (a) Phase-out 270 MT of the 400 MT foreseen in the project document approved by the Executive Committee at the 19th Meeting;
- (b) continue the development of a regulatory framework for and ODS phaseout by the year 2006; and,
- (c) ensure that the program cost-effectiveness is at least 90% of the cost-effectiveness thresholds adopted by the Executive Committee by means of a competitive allocation of the grant funds.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. Decision 25/30 requested the World Bank to submit project completion reports on the projects approved at the 7th and 19th Meetings of the Executive Committee. The Bank submitted a project completion report for the TECFIN part of Phase I (see Annex I). The Secretariat has not received a project completion report on the non-investment project components of Phase I.
2. The Bank indicates that although the project document assumed compensation through the auction programme of US \$2/kg., the Bank determined that a compensation of US \$30/kg. was needed to provide sufficient incentive for SMEs to participate in the auction. Of the 11 projects funded through Phase I, two projects accounted for 113 of the 118 ODP tonnes phased out through the auction at a cost-effectiveness of US \$2/kg. while the other 9 projects accounted for a total phase-out of 6 ODP tonnes at a cost-effectiveness of US \$32.86. This cost-effectiveness is higher than all cost-effectiveness thresholds except for TCA.
3. The Bank submitted a progress report on the status of implementation of Phase II, 1st Tranche that is included in the project document (see Annex II). The project has phased out 113 ODP tonnes in 12 projects, the largest of which phased out 24 ODP tonnes. A project completion report has not been submitted since one is not due until six months after project completion.
4. Chile's consumption of ODS was 714 ODP tonnes when Phase I was approved in 1992. The country's consumption is now 686 ODP tonnes after the implementation of Phase I and 80 per cent of Phase II, 1st Tranche.

RECOMMENDATIONS

1. The Secretariat recommends that the Project Review Sub-Committee consider, and make recommendations to the Executive Committee on the request for the 2nd Tranche of Phase II in the light of its decision 25/30 and the Bank's submissions in that regard.

ANNEX I

PROJECT COMPLETION REPORT

CHILE TECFIN I

SECTION 1: PROJECT DATA

- | | | |
|------|--|--|
| 1.1 | <u>Country:</u> | CHILE |
| 1.2 | <u>Project number:</u> (<i>as per inventory</i>) | CHI/MUS/07/INV/04 |
| 1.3 | <u>Project title:</u> | Implementation of the Technology Conversion Financing Programme (TECFIN) |
| 1.4 | <u>Date of approval of the project.:</u> | June 1992 |
| 1.5 | <u>Percentage of national ownership:</u> | 100% |
| 1.6 | <u>Implementing agency:</u> | The World Bank |
| 1.7 | <u>Local executing agency/
Financial intermediary:</u> | National Commission on the Environment (CONAMA)/Ozone Team |
| 1.8 | <u>National coordinating agency:</u> | CONAMA/Ozone Team |
| 1.9 | <u>Scheduled date of completion:</u> | June 1996 |
| 1.10 | <u>Actual date of completion:</u> | February 1997 |
| 1.11 | <u>Date of project completion report:</u> | January 1998 |
| 1.12 | <u>Completion report done by:</u> | The World Bank |

SECTION 2: EXECUTIVE SUMMARY

ITEM	PLAN/ APPROVED	ACTUAL	NATIONAL SECTOR IMPACT*	COMMENT
ODS phase-out (in ODP tonnes)	729 (1)	118.82	18.5% (2)	TECFIN, a grants program, was part of a comprehensive umbrella project for Chile that included Public Awareness, Ozone Seal, Training, and Institutional Strengthening components. Planned ODP shown was for all components.
Budget and expenditure (US\$)	448,000	426,452	N/A	Remaining funds have been allocated for the second phase of TECFIN.
Cost-effectiveness (in US\$/kg)	N/A	3.59	N/A	When approved, cost-effectiveness criteria had not been established. During the project implementation the overall cost-effectiveness for the project varied from \$2/kg to 4\$/kg.
Project implementation: (in months)	48	56	N/A	Approved in Jun/92 by the ExCom, the umbrella project was effective in Jun 1993; actual implementation of the Investment Component began in Apr/1996. Subproject appraisals of each enterprise project ended in Oct/1996.
- Project duration		10 months	N/A	Investment Component (TECFIN)
- Start-up of project activities at country level as stated by Article 5 Party concerned	1992	1993	N/A	Planning for soliciting eligible enterprises began in 1993. In February 1997 the last subprojects started production. However the first converted company started production in October 1996.
- Grant agreement sub-mitted to beneficiary	Late 1992	May 1993	N/A	Refers to the Umbrella Grant Agreement. Subgrant agreements between CONAMA and enterprises began in 1996.
- Grant agreement signature	Late 1992	July /1993	N/A	Refers to umbrella grant agreement between Bank and CONAMA. Subgrant agreements were signed between CONAMA and enterprises beginning in 1996.
- Bids prepared and requested			N/A	Specific dates for contracts, equip. delivery, etc. were not provided to the Bank. These dates were agreed upon between CONAMA and enterprises.
- Contracts awarded			N/A	Between Oct/96 and Feb/97
- Equipment delivered			N/A	Between Oct/96 and Feb/97
- Commissioning and trial runs			N/A	Between Oct/96 and Feb/97
- Decommissioning and/or destruction of redundant baseline equipment			N/A	Between Oct/96 and Feb/97
- Submission of completion report	1997	Jan 1998	N/A	

Notes

- * Expressed in percentage of national/sector consumption.
- (1) Estimated ODS tons to be eliminated were from both direct and indirect effects. Revised expected impact was about 120 tons ODP from direct elimination.
- (2) All subprojects implemented belong to the refrigeration (domestic and commercial) and rigid foam sectors

Overall assessment of the project: *A brief description of no more than 300 words of the degree to which the project achieved its objective(s), major problems encountered and lessons learned.*

The project is distinguishable in that the management of funds were by a government agency which offered companies a pre-determined subsidy for conversion under a framework of guidelines which also fulfilled ExCom requirements at the time of project approval. The guidelines, which were jointly approved by the World Bank and CONAMA and implemented by CONAMA, included the requirement that enterprises had begun conversion three years prior to actual project implementation and that old equipment was destroyed (although the latter requirement, along with some requirements agreed upon by the World Bank and CONAMA, had not been made mandatory by the ExCom at the time of project approval).

Beginning in November 1993, all components of the umbrella project began implementation, using up about 95% of the allocated funds. Although planning of the investment component (Technological Conversion Financing Programme (TECFIN)) of the umbrella project began once the agreement was signed, products of the other projects such as institutional strengthening were needed before TECFIN could commence actual implementation. Lack of an adequate legal framework in the country for this kind of project consequently led to an implementation delay of almost three years. Once the legal problems were solved (1995), the subprojects were rapidly appraised by the World Bank (April-October 1996), and implemented by the firms (October 1996-February 1997).

Foam and refrigerator sectors were selected based on the existing status of sectors at that time (for instance, the aerosol sector was practically irrelevant at that point in terms of CFC). Rules and conditions for the grant awards program were duly advertised in national newspapers. Participant firms had to show: a) firm's solvency; b) business in foam or refrigeration sectors; c) experience in foam or refrigeration sectors; d) purchases of ODS in the last three years backed by the corresponding invoices and receipts; and e) records of annual production level for the last five years, and projections. Holding firms with more than one subsidiary employing ODS in their production processes were allowed to develop umbrella projects. This was the case of Central de Servicios Técnicos (CST), which consolidated all ODS consumption from its subsidiary firms.

Due to the general lack of experience regarding realistic ODP phase-out potential for the various projects under the umbrella project, a much larger effect on consumption was initially appraised, especially with respect to non-investment activities. The ODP target was consequently adjusted to reflect a more realistic goal and targeted the investment component of the umbrella project (i.e. TECFIN). Project implementation necessitated an on-going adjustment to goals,

including ODP and cost-effectiveness, and serves as an example for other projects of this nature which are sponsored by the MPMF.

TECFIN I funded eleven firms out of a total of 14 proposals, with projects in the sectors of domestic refrigeration (1), commercial refrigeration (5), and rigid foams (5). Three of the firms initially approved, Himmer & Himmer, SAAM S.A. and Supermercado Gran Avenida, requested cancellation before signing the subgrant agreements because of their lack of financial solvency to fund the investments not covered by the grant. 118.82 MT ODP (CFC's and HCFC's) were phased-out with a grant component of nearly \$427,000. TECFIN had an overall cost-effectiveness of \$3.59 per kg of ODP eliminated which was in the range envisioned. At the sectoral level, 65.9 MT ODP (19.1% of 1989 ODP used in foams) were reduced in the rigid foam sector, while 52.91 MT ODP were phased-out from the refrigeration sector (near 22% of 1989 ODP consumption level).

TECFIN initially defined two categories of projects to fund: a) projects eliminating more than 10 tons/yr ODS, eligible for a \$2/kg subsidy; and b) projects eliminating less than 10 tons/yr ODS, eligible for a subsidy up to \$20,000. After having received proposals with a cost-effectiveness which exceeded the limit (Frigorent was approved with a grant cost-effectiveness of over \$600/kg), CONAMA decided to establish a fixed \$30/kg subsidy for the small projects.

In terms of consumption, two projects were to phase out more than 10 MT ODP/yr, and 9 projects were approved for firms with consumption levels lower than 10 MT ODP/yr. The two firms consuming more than 10 MT ODP/yr eliminated 112.69 MT ODP, with a cost-effectiveness of \$2/kg. The other nine firms eliminated 6.2 MT ODP with a cost-effectiveness of \$32.86/kg.

SECTION 3(A): ODS PHASE-OUT

Pre-conversion

3.1 Main lines of products manufactured:

Rigid Foam projects:

Frigocar (vehicle thermal insulation)
 Metalcargo (vehicle thermal insulation)
 IPAC (insulation panels for refrigeration)
 KIFAFI (insulation panels for refrigeration)
 POLIMIN (insulation panels for refrigeration)

Commercial Refrigeration:

Mimet (small and medium refrigeration units for commercial purposes)
 Frigorent (industrial refrigeration)
 Supermarket Plaza Egaña (supermarket)
 SM Macul (supermarket)

SM Vicuña (supermarket)

Domestic Refrigeration:

CST (maintenance)

3.2 Annual production level: Varies from enterprise to enterprise. For example, the two largest ODS consuming companies had the following levels of production: IPAC (178,200 m² PUR), and MIMET (31,254 comm. Refrig. units).

3.3 ODSs consumed: See annexed Table for further details of companies participating in TECFIN I and individual enterprise phase-out.

	MT
CFC-11	106
CFC-12	19
Total:	125
Total ODP eliminated:	118.82
National/sector impact:	15.1% from 786.5 CFC-11 and CFC-12 consumed in 1993 ¹

Post-conversion

3.4 Year of project commissioned: 1996

3.5 Year of commencement of new production: From October to December 1996 eleven companies started new production.

3.6 The transition from ODS-based to non-ODS-based production:

Annex shows ODP to be phased out, ODP of new technology and net ODP phased out for each enterprise.

3.7 If there is a variance between the ODS phase-out target in the project document and the actual ODS phase-out, please explain.

Due to the general lack of experience regarding realistic ODP phase-out potential for every type of project, a much larger effect on consumption was initially appraised, especially with respect to non-investment activities in the umbrella project - estimated ODS tons to be eliminated were from both direct and indirect effects. Revised expected impact was about 120 tons ODP from the investment component only (TECFIN). ODS phased-out quantities have been verified by CONAMA by undertaking field inspections.

¹ Ozone Secretariat Data available at Web Page

SECTION 4: TECHNOLOGY CHOICE

ITEM	PRE-CONVERSION	POST-CONVERSION
4.1 <u>Technology choice</u> Technology employed Environmental impact Determining factor for choice Technology change after approval and reason for change	Rigid foam producers were using low-pressure CFC-11 charging machines. Cold presses. Refrigeration companies were operating with CFC-12 refrigerating equipment. Depletion of the ozone layer. N/A N/A	High pressure foam machines using HCFC-141b, HCFC-22. Refrigerants of HFC 404a and HCFC-22. HFC-134a charging boards. Reduced ODP. Availability, definitive substitutes. N/A
4.2 <u>Availability</u> No. of months spent in acquiring the technology Reason for delay (if any)	N/A N/A	6 (average) Once the projects were appraised there were no delays
4.3 <u>Safety</u> (where applicable) Main safety hazard Measures implemented Standard applied Certification by*	N/A N/A N/A N/A	None reported.

* Please attach copies of certification

4.4. Is there any problem encountered in the implementation of the replacement technology? If yes, please elaborate briefly.

CONAMA reported that no enterprises participating in the conversions experienced difficulties due to the information available on the technology and because most of the conversion technology did not require substantial operating changes in the plants.

SECTION 5: BUDGET AND EXPENDITURES

This is a status report on project expenditures at the time of preparing the project completion report with the understanding that a full financial completion report will be prepared as a supplement once the accounts of the project are closed.

5.1 Summary

ITEM	PLAN/APPROVED (US \$)	EXPENDITURE (TO-DATE) (US\$)	DIFFERENCE/ COMMENT (US\$)
Incremental capital costs	448,000 ⁽¹⁾	424,416	
Incremental operating cost	0	0	
Contingency cost	0	0	
Total	448,000	424,416	This covers the investment component of the larger umbrella program only. The difference in costs is due to technical adjustments.
ODS phase-out (kg/ODP)	729,000 Adjusted to 120,000	118,820	Initial approval claimed 729 ODP for the entire umbrella project. ODS tons included both direct and indirect effects. Revised expected impact was around 120 tons ODP for the investment component.
Cost-effectiveness (\$/kg.)	N/A	3.59	When approved, cost-effectiveness criteria had not been established.

Note

⁽¹⁾ The budget for this component of the overall Chile ODS Phaseout Program was adjusted to \$448,000 to better fit the requirements of the project.

5.2 Budget and expenditure on incremental capital cost

ITEM*	APPROVED	EXPENDITURE	DIFFERENCE	REASON
1. IPAC				
High pressure foam charging machine – R22		\$96,161		
Storage tanks		\$80,447		
Labor		\$28,427		
Accessories		\$19,937		
Thermal insulating panels for production line		\$140,488		
Subtotal	\$128,339	\$365,461	\$237,122	
2. MIMET				
11 Vacuum pumps (Galileo)		\$62,103		
2 HFC-134a charging boards		\$109,472		
Mold modifications and equipment installing		\$12,195		
Subtotal	\$93,672	\$183,770	\$90,098	
3. CST				
60 Elviro-charge machines, Robinair H-17701				
Subtotal	\$120,000	\$188,162	\$68,162	
4. FRIGOCAR				
R141b high pressure dispensing unit – Gusmer FF-1600	\$15,784	\$20,135	\$4,351	
5. Frigorent				
R-404a conversion	\$20,166	\$36,510	\$16,344	
6. Kifafi				
High pressure dispensing unit (R-141b) (Gusmer H-2000)	\$20,000	\$38,737	\$18,737	
7. Metalcargo				
High pressure dispensing unit (Gusmer FF-1600)/ (R-141b)	\$4,740	\$18,996	\$14,256	

ITEM*	APPROVED	EXPENDITURE	DIFFERENCE	REASON
8. Polimin				
High pressure dispensing unit (R-141b) (Gusmer FF-1600)	\$9,120	\$18,996	\$9,876	
9. SM Macul				
2 mid/low temperature centrals operating with R-404a	\$2,505	\$43,388	\$40,883	One piece was purchased and other was adapted to new tech.
10. SM P. Egana				
PROTOCOL equipment operating with HCFC-22	\$3,300	\$184,463	\$181,163	Eliminated the equip. which used R-502 and R-12.
11. SM Vicuna				
R-22 conversion (retrofit, new refrigerating station)	\$5,558	\$87,183	\$81,625	Replaced condenser units.
Total	\$426,452	\$1,185,801	\$759,349	Approved amount only depicts portion of project subsidized by Fund as determined by CONAMA, whereas expenditure shown is for <i>total</i> equipment costs.

*List of equipment approved in the project document. Other costs such as for accessories, operation, training and trials are not listed as they were to be funded in whole by the enterprises. Costs have been verified by CONAMA, by checking invoices and purchase receipts, a reliable source of information in Chile; and by undertaking field inspections.

5.3 Budget and expenditure on incremental operating cost

No incremental costs were funded under TECFIN I.

5.4 Budget and expenditure on contingency cost

CONTINGENCY FUNDS	ITEM(s)	EXPENDITURE*
	Total	N/A
	Approved	N/A
	Difference	N/A

(*) None disbursed under TECFIN I.

SECTION 6: IMPLEMENTATION EFFICIENCY

ITEM	AS PLANNED		DELAY/COMMENT
	YES	NO	
6.1 <u>Project schedule</u>			
Project duration		x	Due to legal reasons, TECFIN could only be started in April 1996.
Start-up of project activities at country level as stated by Article 5 Party concerned	x		Once the legal ground was established for soliciting qualified enterprises, the project was implemented quickly – within one year. Enterprises began conversions before agreement was signed.
Grant agreement submitted to beneficiary	x		
Grant agreement signature	x		
Bids prepared and requested	x		Referred to applications submitted by the companies for the grants.
Contracts awarded	x		As referred to contract agreements with beneficiary enterprises.
Equipment delivered	x		
Commissioning and trial runs	x		
Decommissioning and/or destruction of redundant baseline equipment	x		
Submission of completion report		x	Report was revised to include more information.
6.2 <u>Equipment</u>			
Quantity as planned	x		
Quality as planned	x		
Delays	x		
6.3 <u>Training</u>			
Quantity as planned	x		
Quality as specified	x		
Delays	x		

6.4 Please describe any major problems encountered in project implementation and what was the major cause of delay.

As mentioned above, the major delay preceded the actual signing of the subgrant agreement because of legal issues in Chile. Once these issues were resolved, the agreement was signed and implementation of the project moved rapidly.

SECTION 7: DISPOSAL OF ODS-BASED PRODUCTION EQUIPMENT

7.1 List of equipment rendered unusable

LIST OF EQUIPMENT RENDERED UNUSABLE (the baseline)*		DISPOSAL IMPLEMENTED			
Name of equipment	Description **	Method of disposal	Date of disposal	Implementor	Certified By
Charging units in foam projects		Dismantled and scrapped			CONAMA
Vacuum pumps		Dismantled and scrapped			CONAMA

* List of equipment rendered unusable in the project document

** Description should include Model No. and Serial No.

7.2 Describe briefly the process of destruction and attach copies of certification of destruction.

Low pressure foam charging machines and replaced vacuum pumps have been scrapped. Some old equipment will be adapted for new uses. For each project, CONAMA verified all equipment destruction and disposal that enterprises had in place as a condition for full disbursement. Exact dates and equipment description were not available to the World Bank at the time this report was written.

SECTION 8: OVERALL ASSESSMENT OF PROJECT

Using three quantifiable indicators, namely ODS phase-out (plan v. actual), cost and speed of completion (plan v. actual), give an overall assessment of the project in the scale below.

[] Highly satisfactory, more than planned

[X] Satisfactory, as planned

- [] Satisfactory, though not as planned
- [] Unsatisfactory, less than planned
- [] Unacceptable

Comments from Government:

No comments.

SECTION 9: LESSONS LEARNED

State any lessons that can be drawn from this project that will benefit future projects.

TECFIN I, a market-based pilot project, was successfully carried out as foreseen with the exception of an initial delay and a reduced amount of ODP phase-out due to unrealistic goals at the level of the umbrella project. All participating enterprises made the transition to reduced CFC technology with no difficulties.

Considering that Chile's ODS I was one of the first MP projects to be implemented, the initial expectations regarding the elimination of ODS consumption in the country by means of implementing the umbrella project (the Chile ODS Phaseout Program), were not realistic. As learned during the process of implementation, the reduction of 63% of total ODS consumption in Chile was excessively optimistic (non-investment components were supposed to have a much larger effect on actual consumption). In addition, Chile's sustained economic growth was not adequately related to higher consumption levels per year. To illustrate how expectations have been revised, TECFIN II, which is not a terminal umbrella program, will eliminate 400 ODP tons with about \$4.8 million (not reaching 50% of current consumption) in comparison to the 729 MT initially forecasted to be eliminated with the whole Chile ODS Phaseout Program at a total cost of \$1.2 million (TECFIN I, the investment component of the program amounted to only \$448,000).

Due to the lack of experience in the country, legal problems delayed the project's full implementation. However, as a result of an effort to solve these problems, a solid legal framework is now in place. This has strengthened CONAMA's legal capacity which will be valuable for the implementation of TECFIN II.

The umbrella program approach used in TECFIN I proved to be effective in reducing project preparation costs and avoiding bureaucratic delays (once the regulatory structure was in place), as subprojects were selected by CONAMA, with *joint* approval by the Bank and CONAMA for each individual project. (CONAMA occasionally consulted the World Bank for advice on project implementation and followed initial guidelines agreed upon by the Bank.)

In addition, the umbrella program approach has shown that an overall cost-effectiveness, consistent with MFEC thresholds, can be achieved while allowing for low cost-effectiveness

thresholds for individual subprojects. In so doing, this approach allows a greater participation by small and medium enterprises in technological conversion programs within the MP framework.

Regarding the level of financial incentives provided by the program, TECFIN I shows that the level of resources offered to the larger firms was not attractive enough to promote an ODP-free conversion, particularly due to the high investment costs, such as for hydrocarbon technology, the low international CFC prices and the absence of national regulatory controls.

The project outcome shows that the incentive of granting \$30/kg, was attractive for small and mid-size enterprises. However, as mentioned above, the incentive of \$2 per kg for larger projects did not seem enough to promote larger conversion projects, due to the high level of costs associated with the conversion processes (OTF grants covered about 50% of total costs).

ANNEX

TECFIN I – Summary of Subproject Grant Allocation and Cost-Effectiveness

COMPANY	ODS name	Qty ODS	ODP	ODP phase-out to	Tech	ODS Replace-ment	ODP Replace-ment	ODP not saved	Net ODP Phased-out	Grant	Cost-effec-tiveness (1)	Total	Cost-effectiveness
FRIGOCAR	CFC-11	0.563	1	0.563	HCFC-141b	0.491	0.11	0.05401	0.50899	\$15,784	\$31.01	\$20,135	\$39.56
CST	CFC-12	4	1	4	Recycling	0	0	0	4	\$120,000	\$30.00	\$188,162	\$47.04
Frigorent	R-502	0.1	0.33	0.0334	HFC-404a	0	0	0	0.0334	\$20,166	\$603.78	\$36,510	\$1,093.11
IPAC	CFC-11	66.92	1	66.92	HCFC-22	54.55	0.055	3.00025	64.17	\$131,607	\$2.05	\$365,461	\$5.70
	HCFC-141b	2.27	0.11	0.2497									
Kifafi	CFC-11	0.9	1	0.9	HCFC-141b	0.9	0.11	0.099	0.801	\$20,000	\$24.97	\$38,737	\$48.36
Metalcargo	CFC-11	0.16	1	0.16	HCFC-141b	0.16	0.11	0.0176	0.1424	\$4,740	\$33.29	\$18,996	\$133.40
MIMET	CFC-11	36.75	1	36.75	HCFC-141b	24.5	0.11	2.695	34.055	\$93,672	\$1.93	\$183,770	\$3.79
	CFC-12	14.47	1	14.47	HFC-134a	0	0	0	14.47				
POLIMIN	CFC-11	0.304	1	0.304	HCFC-141b	0.2	0.11	0.022	0.282	\$9,120	\$32.34	\$18,996	\$67.36
SM Macul	R-502	0.25	0.33	0.0835	HFC-404a	0.2	0	0	0.0835	\$2,505	\$30.00	\$43,388	\$519.62
SM P.Egaña	CFC-12	0.104	1	0.104	HCFC-22	0.122	0.055	0.00671	0.10	\$3,300	\$31.95	\$184,463	\$1,785.67
	R-502	0.018	0.33	0.006012									
SM Vicuña	CFC-12	0.171	1	0.171	HCFC-22	0.31	0.055	0.01705	0.17	\$5,558	\$33.09	\$87,183	\$519.01
	R-502	0.042	0.33	0.014028									
				124.73					TOTAL	118.82	\$426,451.75	\$3.59	

(1) Changes over and above \$30/kg for projects phasing-out less than 10 tons. obey to exchange rate fluctuations

ANNEX II

MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEplete THE OZONE LAYER

PROJECT COVER SHEET

(September 1998)

COUNTRY	CHILE
IMPLEMENTING AGENCY	World Bank
PROJECT TITLE	Montreal Protocol Implementation Program – Phase II (Second Tranche)
PROJECT IN CURRENT BUSINESS PLAN	YES
SECTOR/SUB-SECTOR COVERED	Several
ODS USE IN SECTOR (YEAR)	686 MT ODS CFC (1997)
PROJECT IMPACT	270 MT ODP (of 400 MT total Program Impact)
PROJECT DURATION	2 years
REQUESTED GRANT	\$2.8 million (second tranche)
COST-EFFECTIVENESS	90% ExCom sector thresholds or better
STATUS OF COUNTERPART FUNDING	Committed
NATIONAL COORDINATING AGENCY	CONAMA

PROJECT SUMMARY

A first tranche of \$1 million in support of this Program was approved by ExCom at its 19th meeting in May 1996. The Program, as approved by ExCom, was intended to test a competitive mechanism for allocating MPMF resources to beneficiary enterprises using auctions, expressed as dollars per kg of ODS reduced. To date, two calls for bid have resulted in reductions of 135 MT once the projects are fully implemented and \$800,000 awarded to firms in the domestic and commercial refrigeration and foams sectors. The overall Program cost-effectiveness to date is \$6.60/Kg or 17% lower than the ceiling pledged in the May 1996 proposal (90% of ExCom sector thresholds weighted by ODP). This second tranche is requested to support CONAMA's pipeline of additional projects.

Impact of project on country's Montreal Protocol Obligations

This Program helps Chile comply with the 1999 freeze and, moreover, enables further steps towards the 50% reduction of Annex A substances by year 2005.

1. PROJECT OBJECTIVES

The project objectives are to:

- (a) continue the elimination of the 400 annual tons of ODS foreseen in the project document approved by the MPMF ExCom in May 1996. With the resources allocated for the first tranche, near 135 MT ODS will be eliminated once implementation of approved projects is completed. About 270 MT are still pending to eliminate;
- (b) continue the development of a regulatory framework for and ODS phaseout by the year 2006; and
- (c) ensure that the program cost-effectiveness is at least 90% of the cost-effectiveness thresholds adopted by the MPMF ExCom, by means of a competitive allocation of the grant funds.

2. BACKGROUND

At the 19th meeting of the ExCom, the World Bank presented a proposal for a 2-tranche program of US\$4.8 million aiming at demonstrating the viability of engaging prospective beneficiaries of the MF in a competitive process (an auction) to allocate funds to the most cost-effective bids to phase-out ODS (Proposal is attached). The ExCom approved US\$1,000,000 (\$970,000 for this Program and \$30,000 for FI fee) indicating that “no additional funds would be provided until there had been an evaluation of the project as funded to date” (**Decision 19/15**). A Progress Report of the program, and the Completion Report of Phase I were submitted to the MPMF Secretariat before the 25th meeting of the ExCom.

CONAMA has made to date two calls for bid, resulting in the approval of 11 projects in the rigid foam, domestic, and refrigeration subsectors, accounting for the elimination of near 135 MT CFCs at an average cost-effectiveness of \$6.60/kg ODP. CONAMA made a third call for bid last September 1st which closes at the end of October. A pipeline of interested firms has been identified aiming at eliminating about 220 MT CFCs (see section 4).

3. THE AUCTION MECHANISM

As designed and approved by ExCom, the Program consists of the following main steps and conditions:

- ODS consuming firms are invited to bid for grants in return for reductions in kgs of ODS (calls for bid);
- bids, expressed as \$/kg reduced, are screened by CONAMA and the World Bank to ensure MF eligibility and to verify accuracy of the reduction reported;
- bids are ranked in ascending order of bid value (i.e., grant requested per kg of ODS eliminated);
- bids are made within a cost-effectiveness cap established by CONAMA, based on expectations about the sectors participating in each bid;
- bids are awarded the corresponding grant in ascending bid order until the funds for each specific auction are depleted;
- as an additional safeguard, each auction must have a minimum cost-effectiveness equal to 90% of the MF-established threshold for the sectors participating in that bid (weighted by their respective shares of ODS reduction in accepted bids).

4. COMPLETED ACTIVITIES

4.1. Design and Execution of First Auction

The design of the auction program required the preparation of bidding documents that describe the rules and evaluation criteria that the government would use for the auction program. Since this program commits the Government to allocate funds, legal advice was sought to ensure clarity and accuracy of the document. Initially expected to take place in March 1997, the first auction was delayed several months because the Government of Chile issued new procedures for all public bidding documents which required a formal clearance by the *Contraloría de la Nación* (General Comptroller's Office).

The bidding period for the first auction lasted from October 1 to November 30, 1997. The overall cap established by CONAMA was \$7.50/kg based on the expectation that the rigid foams sector would be the primary participant. The bids were evaluated in December and awards were issued in January of 1998. The results of the auction were as follows:

Table 1 – Results from First Auction						
COMPANY	Sector		Net ODP Phased-out	Grant	Project Cost	%Financed
Frioreal	R.Foam	\$3.77	16.92	\$63,845	\$70,940	90.00%
Himmer&Himmer	R.Foam	\$6.90	7.17	\$49,467	\$61,579	80.33%
Sindelen	D.Refr	\$7.00	12.29	\$86,058	\$131,925	65.23%
Sindelen	D.Refr	\$7.00	7.39	\$51,744	\$60,833	85.06%
Multipanel	R.Foam	\$7.50	18.34	\$137,551	\$358,791	38.34%
Subtotal 1st Auction		\$6.26	62.12	\$388,665	\$684,068	56.82%

While the overall cost-effectiveness of the first auction was highly satisfactory at \$6.21/kg, explained in part by the participation of Sindelem – a firm in the domestic refrigeration sector formerly not expected to participate, the total number of bids was lower than expected. The relatively low demand is explained by three factors not fully considered during

the design phase: (a) the declining prices of CFCs in Chile induce users (particularly small firms) to continue using an affordable input; (b) the MP grant thresholds are not attractive enough to small users; (c) ODS users do not yet perceive any government controls on ODS. These lessons prompted design adjustments for the second auction.

4.2. Design and Execution of Second Auction

The second auction was designed to take into account the main lessons learned from the first auction: need for greater promotion; deepening regulatory work; and, stratification of users. CONAMA enhanced its efforts to disseminate the program with small users and increased its regulatory initiatives in the areas of customs controls and listing ODS as hazardous substances to be subject to a manifest mechanism through the Ministry of Health.

As for stratification of users, bidders were classified in 3 categories according to ODP consumption and ceilings for bids were adjusted to increase demand and competition among similarly-sized firms:

- (i) firms consuming up to 3 tons ODS could bid up to a cap \$30/kg;
- (ii) firms consuming between 3 and 30 MT tons; could bid up to \$15/kg;
- (iii) firms consuming over 30 MT tons could bid up to \$9/kg.

The overall threshold for the Phase II Program (90% of EC thresholds) was to be maintained, while allowing small enterprises to compete for the grants. Given that CONAMA knew about the sectors accounted for by the largest users (domestic and commercial refrigeration), the revised Program design was deemed more equitable because smaller firms would receive a larger proportion of project costs than large users.

The bidding was opened in March 1998, with phased closing dates according to the above three categories of participants. At the end, ten firms participated in the second auction, seven of which were approved, as shown below. The other three projects were rejected due to incomplete information about the projects being supported or due to inconsistencies with the policies and rules established by the MPMF.

COMPANY	Sector	Bid	Net ODP Phased-out	Grant	Project Cost	%Financed
Formas Fibra (Nielsen)	R.Foam	\$3.75	4.62	\$17,300	\$22,212	77.89%
Aislaciones Termicas	R.Foam	\$3.87	7.91	\$30,571	\$33,968	90.00%
FORMAC	R.Foam	\$6.09	23.88	\$145,353	\$161,503	90.00%
AISELL	R.Foam	\$8.75	9.53	\$83,424	\$94,800	88.00%
SIMAC	R.Foam	\$9.11	5.01	\$45,630	\$50,700	90.00%
Malbrex	R.Foam	\$9.33	3.15	\$29,427	\$53,177	55.34%
INEMA*	R.Foam	\$11.91	5.00	\$59,550	\$350,789	16.98%
Subtotal 2nd Auction		\$6.96	59.10	\$411,255	\$767,149	53.61%

All presented projects belonged to the 3 to 30 ton intermediate category. Despite the design adjustments to attract smaller firms, the main reasons for lack of participation appear to be: (a) small firms have insufficient capacity and management time to deal with project preparation and design; (b) these companies lack enough resources to co-finance the non-grant component of the projects even at the increased bid cap; and, (c) firms do not perceive regulatory signals indicating the need to incur conversion costs.

At the other end of the spectrum, the larger companies generally require more complex conversions plans, which usually is linked to modernization or expansion plans. The conversion plan requires more time to study the alternative technologies, discuss, and incorporate the conversion projects into financing planning. In particular, for the case of CTI (the largest domestic refrigeration manufacture), it was necessary for the Bank to finance targeted expert advice in order to guide the company regarding technological options and, thus, accelerate its decision-making process. In addition, for all of the three categories, CONAMA has hired an external consultant to promote the auction program among enterprises, and assist in explaining the legal and technical requirements linked to the submission of bids.

The cost-effectiveness of the second bid was \$6.96/kg. When taken together the first two auctions have rendered a cost-effectiveness of \$6.60/kg which is 17% below the corresponding \$7.91/kg pledge corresponding to 90% of the ExCom thresholds weighted by the ODP of the accepted bids. In other words, the Program cost-effectiveness is 17% better than the stated pledge of the original 1996 proposal. In addition, the Program is deemed a useful mechanism considering the following indicators:

- projects are submitted, evaluated, and approved in each auction in a total period of four months which significantly reduces administration costs;
- grant funding never exceeds 90% of total project costs and has leveraged twice as much financing from beneficiaries;
- small and medium firms have access to the Program's benefits (financing and technical assistance);
- reductions contribute to 1999 freeze and 2005 50% reduction.

4.3. Preparation of Third Auction

The third auction was opened last September 1st and will be closed on October 31st. The rules and bidding caps established for the second auction have been maintained. About a dozen firms are expected to participate, with projects in the domestic, commercial refrigeration, and foams sectors. As shown below, more than 270 MT CFCs would be eliminated as two large companies are actively preparing conversion projects and will be submitting bids (CTI and AngloChilena).

2. Table 3 – Forecast Third Auction						
COMPANY	ODS	Sector	ODS Impact	Substitute	Max. Bid	Maximum Grant
Plasticos Sur	CFC-11	R.Foam	2.00	HCFC-141b	30.00	60,000

2. Table 3 – Forecast Third Auction						
COMPANY	ODS	Sector	ODS Impact	Substitute	Max. Bid	Maximum Grant
Other Small (2)	CFC-11	R.Foam	6.00	HCFC-141b	30.00	180,000
Subtotal small < 3 ton			8.00		30.00	240,000
Superfrigo	CFC-11	R.Foam	4.00	HCFC-141b	15.00	60,000
Química Suyet	CFC-11	R.Foam	5.00	HCFC-141b	15.00	75,000
Asiterm	CFC-11	R.Foam	5.24	HCFC-141b	15.00	78,600
Termica Hashke	CFC-11	R.Foam	9.00	HCFC-141b	15.00	135,000
Other Medium (2)	CFC-11	R.Foam	10.00	HCFC-141b	15.00	225,000
Subtotal medium 3-30 tons			33.24		15.00	573,600
Anglo Chilena	CFC-11	R.Foam	48.00	HCFC-141b	9.00	450,000
CTI	CFC-12	D.Refr	74.000	R-134		
CTI	CFC-11	D.Refr	100.000	C-pentane	9.00	\$1,566,000
Subtotal > 30 MT			222.00		9.00	2,016,000
Subtotal 3rd Auction			263.240		\$10.47	\$2,829,600

Near \$2.8 million would be allocated in this auction based on the worst case assumption that all bids are submitted at the consumption category bidding cap, as shown above. Nonetheless, the overall Program cost-effectiveness will remain at the pledged 90% of the ExCom thresholds.

5. COST-EFFECTIVENESS CALCULATION

As foreseen in the Montreal Protocol Implementation Program - Phase II (Annexed), “an overall grant effectiveness limit for each auction has been set at 90% of the MPMF ExCom thresholds, weighted by the share of the winning bids from the respective sectors”. Thus the overall cost-effectiveness for each auction will depend on the participating sectors, weighted by the ODS consumption of the particular companies. As seen in Table 4, the first auction achieved a net cost effectiveness of \$6.26/Kg, about 28% better than the cost-effectiveness limit. Auction 2 was practically at the limit, while the overall cost-effectiveness for the two auctions is better than the cost-effectiveness limit by more than 17%.

Table 4 – Cost Effectiveness calculation							
COMPANY	Sector	Cost-eff	Net ODP Phased-out	Grant	% Total	90%Sector	CE Limit
Frioreal	R.Foam	\$3.77	16.92	\$63,845	27.24%	\$7.05	1.92
Himmer&Himmer	R.Foam	\$6.90	7.17	\$49,467	11.54%	\$7.05	0.81
Sindelen	D.Refr	\$7.00	12.29	\$86,058	19.79%	\$12.38	2.45
	D.Refr	\$7.00	7.39	\$51,744	11.90%	\$12.38	1.47
Multipanel	R.Foam	\$7.50	18.34	\$137,551	29.52%	\$7.05	2.08
Subtotal 1st Auction		\$6.26	62.12	\$388,665	100.00%		8.74
Formas Fibra (Nielsen)	R.Foam	\$3.75	4.62	\$17,300	7.82%	\$7.05	0.55
Aislaciones Termicas	R.Foam	\$3.87	7.91	\$30,571	13.38%	\$7.05	0.94

Table 4 – Cost Effectiveness calculation

COMPANY	Sector	Cost-eff	Net ODP Phased-out	Grant	% Total	90%Sector	CE Limit
FORMAC	R.Foam	\$6.09	23.88	\$145,353	40.40%	\$7.05	2.85
AISELL	R.Foam	\$8.75	9.53	\$83,424	16.13%	\$7.05	1.14
SIMAC	R.Foam	\$9.11	5.01	\$45,630	8.47%	\$7.05	0.60
Malbrex	R.Foam	\$9.33	3.15	\$29,427	5.33%	\$7.05	0.38
INEMA	R.Foam	\$11.91	5.00	\$59,550	8.46%	\$7.05	0.60
Subtotal 2nd Auction		\$6.96	59.10	\$411,255	100.00%		7.05

Cost-effectiveness for the third auction in a worst case scenario would be about \$10.47/kg, and if such result would materialize, the overall Program cost effectiveness would be \$9.27/kg.

6. REGULATORY ACTIVITIES

The Government has initiated the process of controlling the import of ODS by the use of licenses through customs administration. ODS have been included in the list of hazardous substances, which triggers a monitoring system of manifests from users to the implemented by the Ministry of Health with CONAMA's assistance. An assessment of additional regulatory measures to prevent the import of already phased out substances, as well as the future import of ODS-using goods, such as appliances, is under way.

7. GRANT REQUEST

This project requests a second tranche of \$2.8 million from the original request of \$4.8 million. A third tranche for the remaining \$1 million will be requested in 1999. The grants awarded to the companies will not cover the total conversion costs in most cases. The extension of the grants will be conditional on the commitment of the firms to finance the non-funded part of the project. As shown by the first two allocations, the enterprises are funding more than half of the total project costs.

7. PROJECT IMPACT

The project will complete the elimination of 270 MT ODS, completing the elimination of the initially foreseen 400 MT ODS. About 135 MT ODS will be eliminated as a result of the first two auctions.

7. PROJECT IMPLEMENTATION

CONAMA together with the World Bank, will supervise the implementation of this project (see Project Monitoring Milestones, Annex VI).

Implementation schedule:

TASK	1998	1999				2000	
	Q4	Q1	Q2	Q3	Q4	Q1	
1. a) MLF approval and funding b) Subgrant agreements ¹	X	X	X				
2. a) Equipment selection c) Equipment procurement d) Installation			X X	X X X	X X X	X	
3. a) Trials and start-up b) Training/Certification					X X	X X	
4. a) First disbursement b) Last Disbursement c) Equipment disposal verified d) Completion report			X	X	X	X	X

7.1 MILESTONES FOR PROJECT MONITORING

ACTIVITY	No later than
Grant Agreement Submitted to beneficiaries	Feb. 99
Grant Agreement Signatures	Feb 99 – June 99
Bids prepared and requested	Jan – April 99
Contracts awarded	April – Aug. 99
Equipment delivered	July – Oct.. 99
Commissioning and trial runs	July-Nov. 99
De-commissioning and/or destruction of redundant baseline equipment	July – Dec. 99
Submission of project completion report	March 2000