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Executive Committee of
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Implementation of the Montreal Protocol

Seventeenth Meeting
Montreal, 26-28 July 1995

COUNTRY PROGRAMME: VENEZUELA

This document consists of:

- Comments and Recommendations of the Fund Secretariat
- Country Programme Evaluation Sheet (prepared by the Fund Secretariat)
- Project proposals submitted with the Country Programme

COMMENTS AND RECOMMENDATIONS OF THE FUND SECRETARIAT

COMMENTS

1. The Country Programme conforms to the format of the approved guidelines.

2. In 1994, the total consumption of controlled substances in Venezuela was 3,273 ODP tonnes. In the same year, Venezuela produced 6,150 tonnes of controlled substances at Produven, distributed as follows: 919.1 tonnes of CFC-11, 3,700.8 tonnes of CFC-12, and 1,530.4 tonnes of HCFC-22. Of the total production, Venezuela exported 1,817.5 tonnes.

3. About 80 per cent of the total consumption of ODS is in the refrigeration sector, 10.3 per cent in foams and 9.5 per cent in solvents.

4. The proposed strategy by the Government is based on: (i) proceeding with an early technological and industrial conversion to prevent any problem with supplies of controlled substances and to ensure an early assimilation of new alternative technologies; (ii) giving priority to the conversion of the refrigeration sector; and (ii) producing and exporting ODS replacement chemicals, preferably with zero ODP potential, and for use in the refrigeration sector.

5. Based on the Montreal Protocol's principles that during the grace period there are no restrictions to export CFCs and HCFCs to other Article 5 countries, Venezuela will continue to produce these chemicals. The production volume will depend on the national consumption and on the demand of other Article 5 countries.

6. A project for the conversion of the CFCs production plant to HFC-134a is under preparation. The incremental cost for the conversion has been estimated in the country programme at US $57.5 million.

7. The country programme contains detailed lists with projects already implemented, projects being implemented, projects to be presented for consideration by the Executive Committee; projects under preparation; projects identified; and projects pre-identified. The total incremental costs associated with these projects are estimated at US $84.46 million.

8. The Country Programme includes the following project proposals for which funding is requested:

- Institutional strengthening (US $326,028): The project relates to the renewal of the support provided to FONDOIN for the period 1996-1998. In October 1992, the Committee allocated US $100,000, through UNDP, for institutional strengthening and additional US $229,192 in March 1993. Due to the special nature of this type of proposal, the Secretariat is requesting Executive Committee guidance on the treatment of such proposals.

- Workshop for identification and preparation of project proposals in the foam and solvent sectors (US $36,390). The country programme indicates that conversion to non-ODS technologies in these two sectors will start in 1996-1998.
- National workshop on the implementation of ODS replacement technologies (US $10,790): Taking into consideration the national workshops and technical assistance programmes under implementation in the halon and refrigeration sectors which represent nearly 80 per cent of the total ODS consumption in the country; the investment projects approved for the conversion to alternative technologies in the refrigeration and foam industries in Venezuela; and the other regional workshops and training programmes already approved, eligibility of this activity is in doubt.
- Pilot project on recovery and recycling in central air conditioning systems (US $285,120). The Secretariat discussed the proposal with UNDP as the agency selected by the Government to implement the project. UNDP agreed to defer the proposal and develop a full scale project, with emphasis being placed on negative pressure chillers, and taking into account activities already approved in the country.

RECOMMENDATIONS

9. The Fund Secretariat recommends as follows:

10. To approve the Venezuela Country Programme. Approval of the Country Programme does not denote approval of the projects identified therein or their funding levels.

11. In accordance with the Executive Committee decision on implementation of country programmes (UNEP/OzL.Pro/ExCom/10/40, para 135), to request the Government of Venezuela to provide information on the progress of implementation of the country programme within one year of its approval, and annually each subsequent year. Using the approved format, the initial report, covering the period 1 August 1995 to 31 December 1996, should be submitted to the Fund Secretariat not later than 31 March 1997.

12. The Secretariat further recommends as follows:

- To defer approval of the renewal of the institutional strengthening project pending a decision by the Committee on procedures on how to treat such proposals and to determine the basis of their funding levels;
- To disapprove the workshop for identification and preparation of project proposals in the foam and solvent sectors since the identification must have taken place during the preparation of the Country Programme;
- Not to approve the request for the national workshop on the implementation of ODS replacement technologies; and
- To defer the proposal on the pilot project on recovery and recycling in central air conditioning systems and to request UNDP to develop a full scale project, with emphasis being placed on negative pressure chillers, and taking into account activities already approved in the country.

VENEZUELA COUNTRY PROGRAMME EVALUATION SHEET

National Implementing Agency: Venezuelan Fund for Industrial and Technology Conversion (FONDOIN)

Status of ratification of the Vienna Convention and the Montreal Protocol

	Signature	Ratification	Entry Force
Vienna Convention (1985)		01/Sep/88	29/Nov/88
Montreal Protocol (1987)	16/Sep/87	06/Fev/89	07/May/89
London Amendment (1990)		29/Jul/93	27/Oct/93
Copenhagen Amendment (1992)			

Production of controlled substances: 6,150 metric tonnes (mt)

Consumption of controlled substances (1994): 3,567.8 metric tonnes
(excluding methyl bromide) 3,194.1 weighted tonnes (ODP)

Substance	CFC						Halon			Solvents			M-Br
(ton)	11	12	113	114	115	Total	1211	1301	Total	CTC	MCF	Total	
ODS	379.9	2,577.0	59.1	17.6	118.6	3,152.2		4.0	4.0	20.0	391.6	411.6	
ODP	379.9	2,577.0	47.3	17.6	71.2	3,092.9		40.0	40.0	22.0	39.2	61.2	

Source: Country Programme (1995)

Distribution of ODP by substance:

CFC: 96.8% Halon: 1.3% CTC, MCF: 1.9%

Distribution of ODP by sector:

Sector:	Aerosol	Foam	Halon	Refrig.	Solvent
Consumption (tonnes):	25.2	512.3	40.0	2,508.2	108.5
Percent of total:	0.8%	16.0%	1.3%	78.5%	1.9%

Note: 6,036 tonnes of CTC were used as raw material for the CFC production

Country Programme

Duration of country programme: 4 years (1995-1998)

ODS phase-out target:

Complete phase out by 2000

Phase-out priority area:

Refrigeration sector

Cost of activities in country programme: $84,456,738

Strategy:

The strategy proposed by the Govt. is to have an organized conversion process, giving precedence to specific sectors, striving to convert all companies simultaneously. The strategy is based on proceeding with an early industrial conversion, avoiding problems with supplies of ODS, ensuring an early assimilation of alternative technologies; giving priority to the refrigeration sector; and producing and exporting ODS replacement substances.

COUNTRY:	VENEZUELA
PROJECT TITLE:	Renewal of Institutional Strengthening
SECTOR:	Preparation and Implementation of Policies
ODS CONSUMPTION:	3,567.8 MT in 1994 (4,973.8 MT including HCFCs and methyl bromide)
PROJECT DURATION:	3 years (1996-1998)
PROJECT IMPACT:	An acceleration in the phase out of ODS production and consumption
TOTAL COSTS::	US$ 633,824
INCREMENTAL COSTS:	US$ 326,208
IMPLEMENTING AGENCY:	UNDP
NATIONAL IMPLEMENTING AGENCY:	FONDOIN

PROJECT DESCRIPTION

1. On October 16, 1992, the Government of Venezuela created FONDOIN (Fundación Fondo Venezolano de Reconversión Industrial y Tecnológica - the Venezuelan Fund for Industrial and Technological Conversion). Its main objective is to coordinate programs and projects to phase out the production and consumption of ODS in Venezuela. At the same time, it requested funds to the MPMF Executive Committee, as institutional strengthening, to partially cover FONDOIN's installation and operation expenses during its first three years.

2. At its Eighth Meeting, in October 1992, the Executive Committee approved US$ 100,000 for institutional strengthening in Venezuela. At its Ninth Meeting in March 1993, it approved a complement of US$ 229,192 for the same purpose, totaling US$ 329,192 for the 1993-1995 period.

3. The Program of Venezuela gives a detailed description of FONDOIN. On the other hand UNDP, selected as implementating agency for the institutional strengthening project, and the Secretariat of the MPMF have received the annual reports of FONDOIN for 1993 and 1994, as well as an update until June 1995. In these documents it is evident that FONDOIN has very successfully fulfilled its role of promoting industrial and technological conversion, which is a key element in having projects and in phasing out ODS production and consumption in Venezuela.

4. Regarding projects, seven have been implemented, for US$ 1,757,367 in incremental costs, and a reduction in ODS consumption of about 210 tons of CFCs and halons. There are 11 projects in progress, at a cost of US$ 8,498,500 and a decrease of 235 tons of CFCs and halons.

5. Between 1992 and 1994, ODS production has decreased 16.2% and consumption has decreased 30.4% equivalent to 2,176.5 tons of ODS. The economic recession has undoubtedly influenced this, but it has also been largely the result of FONDOIN's activities, both in the promotion of projects as in technical advise and awareness campaigns.

6. FONDOIN's efficiency is due mostly to the originality of its organizational design, conceived to guarantee the acceleration of the phase out of ODS production and consumption. Indeed, it is an institution only devoted to this objective, so it can concentrate its efforts to that end. On the other hand, it has such an administrative autonomy that it can perform swiftly and with great flexibility. It has a small but highly qualified staff and the latest equipment all of which guarantees high productivity hand efficiency. Finally, it has formal links with all public and private organizations that are directly involved in the process of reducing ODS, which are also members of its Board of Directors, thus ensuring effectiveness and relevancy in decision making and execution.

7. FONDOIN was created and operates with very limited financial resources. Its creation decree excluded receiving resources from the State budget, so it must generate its own income, which essentially comes from the institutional strengthening granted by the MPMF, as well as from fees for services delivered by FONDOIN, and voluntary donations and contributions, mainly from private institutions. Its excellent staff and equipment allows great savings because the institution itself can fulfill needs that otherwise would require hiring third parties. All of this translated into a financial administration that is prudent as well as creative, which so far has avoided budget problems.

8. FONDOIN's financial administration since its creation is summarized in the following table.

FONDOIN: Budget Performance. January 1993 to March 1995.

Componets	Institutional Strengthening	%	Other sources	%	Total	%
Staff	156,200	75.6	50,359	24.4	206,559	60.1
Official Travels	21,000	56.4	16,228	43.6	37,228	10.8
Equipment	14,870	87.7	2,075	12.3	16,945	4.9
Miscellaneous	76,122	91.7	6,891	8.3	85,013	24.2
Total	268,192	78.0	75,553	22.0	343,745	100.0

Here we see the resources for institutional strengthening have been essential for the establishment and operation of FONDOIN, because that source covered 78% of total expenses, particularly staff, equipment and miscellaneous.

9. These grants however, have decreased, forcing FONDOIN to increase income from others sources, as can be seen in the following table.

FONDOIN. Income Budget. 1993-1995.

Periods	Institutional Strengthening	%	Other sources	%	Total
1993	142,643	85.4	24,370	14.6	167,013
1994	99,420	71.6	39,392	28.4	138,812
1995	87,129	52.2	79,849	47.8	166,978
January - March 1995	26,129	68.9	11,791	31.1	37,920
April - December 1995	61,000	47.3	68,058	53.7	129,058
Totals					
January 1993-March 1995	268,192	78.0	75,553	22.0	343,745
1993-1995	329,192	69.6	143,611	30.4	472,803

Here we see that the participation of institutional strengthening in FONDOIN's resources has decreased from 85.4% in 1993 to 71.6% in 1994 and to only 52.2% in 1995.

10. It is estimated that the triennium 1996-1998 will be critical to phase out ODS production and consumption in Venezuela. The Program of Venezuela sets ambitious goals in refrigeration and foams, leading to almost a total conversion of those sectors to

substitutes with no ODP. Likewise, a considerable expansion in ODS recovery and recycling is proposed, as well as starting to retrofit equipments in the solvent and storilant sectors. The number of companies in those sectors and the type of activitities that FONDOIN must carry out implies a work load greater than the present one. However, the administration has proposed to minimize the impact of this work load increase on the budget. On the other hand, the effect of inflation on costs is less manageable, which up to now could only be compensated with measusres to control expenses and an increase form other sources. Since FONDOIN's ability to generate additional income is limited, it is expected that for the period between 1996-1998, there will be a new loss in the buying value of the income, because the budget only foresees an adjustment for the accumulated inflation of the previous three years.

11. The budget for 1996-1998 does not establish significant changes in the amount and structure of expenses nor in the composition of income compared to 1995, as can be seen in the following table:

FONDOIN: Proposed Budget 1996-1998.

Components	Institutional Strengthening	%	Other sources	%	Total	%
Staff	265,176	58.0	191,868	42.0	457,044	72.1
Official Travels	27,890	53.5	24,284	46.5	52,174	8.2
Equipment	0	0.0	11,296	100.0	11,296	1.8
Miscellaneous	33,142	29.3	80,168	70.7	113,310	17.9
Total	326,208	51.5	307,616	48.5	633,824	100.0

The distribution per income source is at a level sumilar to 1995, with a small increase in the participation of others sources. Included in institutional strengthening are only the staff, official travels and miscellaneous components, which are the only ones covered at present. The amounts for equipment, basically to repontentiate, maintain and repair the existing ones, is fully covered by other sources.

12. Regarding the distribution by components, the staff entry will have a somewhat higher proportion than the previous triennium. This is due on the one hand to an adjustment for accumulated inflation, and on the other to a decrease in total expenses for equipment, official travels and miscellaneous.

13. Regarding the application for institutional strengthening, only the three individuals whose remuneration have been covered with those resources in the previous triennium are included, that is, the President of FONDOIN, the President's Executive Assistant, and the Finance and Administration Manager. However, in the application for the previous

triennium it was estimated that inflation would be compensated with the devaluation, so remunerations were not increased yearly, but these index did not behave as expected. Indeed, since December 31st 1992 to March 31st, 1995 the consumer price index has gone from 1,071.6 to 2,911.7 according to the statistics publised by the Central Bank of Venezuela in its Weekly Indicator Report, which represents an increase of 171.72%. On the other hand, according to the same source, the exchange rate went from 79.55 to 170 Bs. / US$ during the same period, indicating a devaluation of only 113.7%. If the exhange rate is deflated by the price index, there is a 27% loss in buying power. For an institution like FONDOIN, which requires a highly qualified staff in order to operate, it is essential to have a remuneration that is competitive in the market, therefore an adjustment that compesates at least the accumulated loss of buying power in remuneration is proposed. Regarding official travels and miscellaneous, areas where it is less difficult to do corrections, there is an adjustment of only 16%, compared to the budget for 1995, which was US$ 8,000 and US$ 9,511 respectively. Finally, the budget does not include a provision for contingencies.

14. Based on the previous account, the Government of Venezuela requests the MPMF Executive Committee to renew the institutional strengthening for FONDOIN for the amount US$ 326,208, to be broken down as follows:

FONDOIN: Renewal of Institutional Strengthening. 1996-1998.

Components	Project Total 1996-1998	1996	1997	1998
-Staff	265,176	88,392	88,392	88,392
- President	137,160	45,720	45,720	45,720
- Executive Assistant	36,576	12,192	12,192	12,192
- Finance Manager	91,444	30,480	30,480	30,480
Official Travels	27,890	10,319	9,204	8,367
Miscellaneous	33,142	12,263	10,937	9,942
Total	326,208	110,974	108,533	106,701

15. The amount requested is within the limits established by the Executive Committee for countries with an ODS consumption like Venezuela, and it is slightly lower than the amount granted for the previous triennium. These resources will be complemented with income from other sources for US$ 307,616, which will cover FONDOIN's reamaing expenses. This includes the fees of the Project Manager and the Administrative Assistant, both full time, and a Legal Advisor hired on a free lance basis, as well as the expenses for equipment, 46.5% of official travel expenses and 70.7% of miscellaneous expenses.

16. The amount requested is expected to be approved in this Executive Committee meeting to ensure the continuity of FONDOIN's cash flow in 1996, since it must be

anticipated the time that last the transfer of resources to the implementing agency and the legal and administrative arrangements before starting disbursements to FONDOIN.

COUNTRY:	VENEZUELA
PROJECT TITLE:	Workshops to identify projects in foams and solvents
SECTOR:	Foams and Solvents
ODS CONSUMPTION:	Foams: 512 MT in 1994 Solvents: 488 MT in 1994
PROJECT DURATION :	1995-1996
PROJECT IMPACT:	Identification and preparation of at least ten projects to replace CFC-11 in foams and CFC-113 and methylchloroform in solvents
PROPOSED BUDGET:	US$ 36,390
IMPLEMENTING AGENCY:	UNDP
NATIONAL IMPLEMENTING AGENCY:	FONDOIN

PROJECT DESCRIPTION

1. Workshops and seminars have proven to be a successful modality in Venezuela to identify and start preparing projects in refrigeration, air conditioning and fire protection sectors.

2. The content of these workshops, generally a day long, is usually one presentation about the ozone layer problem and international actions to solve it, another about Venezuelan policies and strategies on this matter and FONDOIN's role, and another about the development and present state of technologies to replace ODS in the respective sector. Then the participants present cases, and it ends with an explanation of procedures to prepare and chanel projects. The first two subjects are presented by representatives of MARNR and FONDOIN, and the third by a foreing expert invited through the implementing agency. The workshops are promoted through the press and direct communications to companies and associations in the sector. Attendance is usally large.

3. The Program of Venezuela states that in the foams and solvents sectors it has been very difficult to identify or motivate many companies that use ODS; therefore it is

proposed to fill those gaps through workshops. The project foresees one workshop for foams and two for solvents. One workshop will take place in the second half of 1995 and the other two in the first and third quarter of 1996.

4. An estimate of local costs, based on FONDOIN's previous experience is detailed as follow:

	US$
Local.	925
Simultaneous interpretation.	600
Rent of equipment (booths, receivers and other simultaneous interpretation equipment, overhead projector, slide projector, boards, monitor, VHS, screen).	950
Promotion (news ads, mail, fax).	833
Documents reproduction (200 originals times 100).	1,000
Sundry and supplies (folders, dividers, credentials, pencils, notebooks, certificates).	992
Refreshments.	400
Local support personnel (secretary, protocol officers, messenger, event coordinator).	2,930
Total per workshop	8,630

5. To the above amount must to be added the travel expenses and fees of the invited expert for each workshop, who will be hired directly by UNDP, estimated at US$ 3,500 each.

6. Total costs would therefore be US$ 36,390, including local costs (US$ 25,890) and foreing experts (US$ 10,500).

COUNTRY:	VENEZUELA
PROJECT TITLE:	National Workshop on the implementation and adaptation of technologies to replace ODS.
SECTORS:	All
ODS CONSUMPTION:	4,973.8 MT in 1994
PROJECT IMPACT:	Accelerate the assimilation and adaptation of technologies to replace ODS
PROJECT BUDGET:	US$ 10,790
IMPLEMENTING AGENCY:	UNDP
NATIONAL IMPLEMENTING AGENCY:	FONDOIN

PROJECT DESCRIPTION

1. FONDOIN and the Universidad Central de Venezuela (Central University of Venezuela - UCV), the country's main university, have established that different researchs on ODS replacement and the adaptation and implementation of new technologies are being performed, as well as studies related to updating curricula in those areas. These researchs and studies usually have no connection to FONDOIN, and are not within the context of the national strategy for ODS phase out.

2. FONDOIN and UCV agree on sistematizing those researchs and studies, so as to integrate them to the program and projects that are being prepared, and to ensure the flow of technical information that FONDOIN has, as well as the dissemination of results to those interested.

3. FONDOIN and UCV have agreed to cooperate in this matter, and the first step will be to carry out a national workshop to identify researchs and studies on the adaptation of technologies to replace ODS that are being carried out at universities and other educational and research institutions in the country, and to promote studies linked to the programs and projects contained in the national strategy, as well as a network to exchange information on new technologies.

4. FONDOIN and UCV have also agreed that this workshop be the main activity in the country to celebrate the International Day for the Preservation of the Ozone Layer. As it is

known, the United Nations General Assembly established September 16th for that celebration, based on a proposal from Venezuela. The respective resolution urges countries to celebrate that day, which has been reiterated by UNEP. FONDOIN considers that the best way to do that is through an activity such as the one proposed, which is directly linked to concrete projects on ODS phase out.

5. The workshop will have a significant impact in several aspects. First, it will allow to structure the initiatives that are scatterred, regarding the implementation and adaptation of technologies to replace ODS, in a coherent program. Second, it will foster a greater and better use of universities and technological research centers for industrial conversion projects. Third, it will allow the design and implementation of a network to ensure that information on technologies to replace ODS is chanelled to individuals and institutions that require it, and do not have at the moment direct access to it. Fourth, it will offer educational institutions the possibility to start, on a firm basis, to review and update courses related to technologies based on ODS and their replacements. Finally, it will give a practical content to the celebration of the International Day for the Preservation of the Ozone Layer.

6. UCV guarantees that qualified professionals from around the country, who are performing or are interested in performing researchs and studies related to the use and adaptation of technologies to replace ODS, will participate in this workshop. UCV can also cover some expenses, like travel costs for their teaching and research staff located out of the capital, the local, the audiovisual equipment and part of the support and promotion staff. FONDOIN will cover the travel costs for teachers and researchers from other universities and research centers from other cities, documents reproduction, press releases, and persons for local support.

7. The Program of Venezuela includes these activities in its Action Plan. The budget requested from the MPMF includes only FONDOIN's expenses, broken down as follows:

	US$
Travel expenses (15 participants at US$ 250 each)	3,750
Refreshments (240 at US$ 4 each)	960
Document reproduction (140 copies of 400 originals at US$ 0.05)	2,800
Press releases (2 at US$ 440 each)	880
Support personnel (2 at US$ 1,200 each)	2,400
Total	10,790

COUNTRY:	VENEZUELA
PROJECT TITLE:	Pilot project for recovery and recycling of refrigerants in central air conditioning
SECTOR:	Air Conditioning
ODS CONSUMPTION:	1,819.4 MT in 1994
PROJECT DURATION:	16 months
PROJECT IMPACT:	Recovery and recycling of 26 MT of CFC-11 and CFC-12
PROPOSED BUDGET:	US$ 285,120
IMPLEMENTING AGENCY:	UNDP
NATIONAL IMPLEMENTING AGENCY:	FONDOIN

PROJECT DESCRIPTION

1. The Program of Venezuela gives preference to ODS recovery and recycling projects. Venezuela has developed very successful initiatives in this area, which have served to evaluate recovery and recycling as an efficient alternative for a significant reduction of ODS emissions into the atmosphere. This experience has served to introduce improvements in the design and implementation of new Venezuelan projects on ODS recovery and recycling, and to perform similar projects in other countries.

2. FONDOIN has prepared two new projects for consideration of the Executive Committee, one through bilateral cooperation with Canada for Phase 2 of the recovery and recycling of halon 1301, and for the banking of halons 1211 and 1301, and another for the recovery and recycling of refrigerants in chillers, for which the UNDP was selected as implementing agency.

3. This project emerged from the CFC-12 to HFC-134a chiller retrofitting project, for which the World Bank is the implementing agency. During the preparation and implementation of the project, it was verified that there are ODS emissions in the atmosphere, at times significant, due to improper practices in the repair and maintenance of equipment leading to a high rate of leaks of refrigerants. On the other hand, refrigerants are not always recovered or recycled during repairs, and when they are, instead of using special machines, they use inefficient methods that recover only part of the refrigerant,

between 50 and 80% depending on the method used; they do not guarantee the minimum degree of purity for safe reuse either.

4. FONDOIN visited and interviewed several chiller maintenance and repair companies which serve a significant part of the market, and found that in all cases there is a wide margin to reduce ODS emissions into the atmosphere by introducing modern recovery and recycling practices, as well as training in improved maintenance practices. On average, these companies perform repairs once every two months, in units that have an average capacity of 300 RT, equivalent to 510 Kgs. of refrigerant in positive pressure, and 570 Kgs. in negative pressure. In all cases, the refrigerant must be taken out of the unit. They also do several minor repairs in which refrigerant leaks can happen. Finally, a lack of adequate preventive maintenance causes leaks that last for weeks and even months before they are controlled. All this offers a real chance to significantly reduce ODS emissions into the atmosphere.

5. The project is similar to those in mobile air conditioning and domestic refrigeration, and consists in selecting a group of chiller maintenance and repair companies, carrying out training workshops in recovery and recycling of refrigerants, and improving maintenance and leak control. After this is done, they would be given appropiate chiller recycling equipment to be used for a year under supervision of FONDOIN.

6. Ten large companies with a recognized trajectory will be selected to participate in the project. Each will be assigned two recovery and recycling machines, one for positive pressure, and another for negative pressure, with all their attachments. It is estimated that together, these companies could recover and recycle the charge of 60 units in one year, which represents an average of 32.4 tons of refrigerant. Assuming that at present they are recovering 60% of that charge using inadecuate methods, the project guarantees a net recovery of 13 tons of refrigerant that would fulfill the standards for reuse. To this we must add the decrease of emissions due to leaks whose average rate is between 10% and 30%. Assuming that those leaks are eliminated, another 13 tons coming from emissions would be avoided, for a total of 100 maintenance operations.

7. Project costs are broken down as follows:

	US$
10 refrigerant recovery and recycling units, for positive pressure chillers.	118,500
10 refrigerant recovery and recycling units, for negative pressure chillers.	64,500
Training workshops.	32,000
Technical assistance and supervision.	44,200
Contingencies (10%).	25,920
Total	285,120

10. The equipment includes recovery and recycling machines, filters, hoses, refrigerant containers, leak detectors, vacuum pumps, refrigerant sentinels, charging stations and other minor implements. The training workshops include local and travel expenses for two experts who will be hired by the implementing agency. Supervision includes fees for supervision, data gathering, technical assistance, and preparation of quarterly reports. Regarding operation expenses, it is estimated that even though the savings will be relatively low, because they are already recovering a high proportion of the refrigerant, companies would cover the additional costs of labor, transportation and supplies. Nevertheless, it is assumed that the difference, if any, will be covered by the beneficiaries, so funds are not requested for that purpose. On the other hand, FONDOIN's monitoring will allow to accurately determine operational costs and savings for this type of projects.