FONDOIN

FONDO DE RECONVERSION INDUSTRIAL, Venezuela

Strategy Plan of CFC-11 Phase-out from the Foam Sector of Venezuela

36th Meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol

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CONTENTS

1. INTRODUCTION

The strategy plan has been prepared by FONDOIN in accordance with the decisions 34/58 of the Executive Committee.

"The Government of Venezuela has been requested to submit a status report of the foam sector indicating the current consumption of ODS, progress of the phase out of ODS and a plan to complete the phase out of the remaining consumption in the sector as a prerequisite for further funding of projects in the foam sector".

Taking into consideration that all remaining enterprises of the sector eligible for the MLF funding are dealing with production of rigid PU foams, except one from manufacturing of flexible molded PU foam: Enveta *, the plan actually covers the rigid PU sub-sector.

a. The Issue

The majority of PU foam enterprises of the country belong to the SME industrial sector. Therefore, it is very difficult to identify the actual number of these factories, to verify their eligibility for the MLF funding in terms of actual CFC11 consumption and the installation time, and to identify all the sources of CFC11- polyol supply.

Due to the above reasons it appeared that during the process of the projects formulation for this sector a certain inconsistency between ODS consumption data previously reported by FONDOIN and the data indicated later on in the project proposals has been discovered.

The thorough analysis of the issue shows that the above-mentioned inconsistency was caused because it was expected the enterprises are using only local CFC11 produced by PRODUVEN. However, during visits to the enterprises to collect the background information it was found that many of these are also buying imported premixed CFC11 from the local distributors.

* The only factory (ENVETA), included in the plan which is manufacturing moulded flexible PU foams (car seats) is also remaining. The project proposal for this factory has already been prepared and submitted by UNIDO in 2001 and discussed in general with the MLF Secretariat.

b. Methodology of the strategy plan preparation

In light of the relevant decisions of the ExCom, the following actions have been undertaken by FONDOIN:

A specialized group of national experts established under coordination of FONDOIN, for the relevant independent sources of baseline information and data identified and contacted (PRODUVEN, local system houses, distributors of imported chemicals, etc.); the updated list of remaining enterprises reviewed in light of the eligibility criteria; all pre-selected enterprises have been visited to collect the necessary information and data.

The pre-selected enterprises were requested to fill in a questionnaire to provide the following information:

a) Name and address
b) Date of establishment
c) Ownership status
d) Mixture of CFC11-polyol consumption for the last three years
e) Providers of the mixture CFC11-polyol
f) Foam machine, manufacturer, year of purchase, capacity
g) Products and production
h) Use of substitute: HCFC141b

Based on the questionnaire, a preliminary list was prepared and consulted with the system houses to complete the information. After that the final list was completed and the enterprises were organized and regrouped in two umbrella projects, leaving apart the enterprises with consumptions lower than 4 ODP tons to be included in a terminal project.

2. BACKGROUND

2.1 General description of the sector.

CFCs 11 and 12 have been used in Venezuela to produce PS rigid foams and PU rigid and flexible foams for insulation of display cabinets, construction of cold rooms, panel production for the insulation industry, seats for automotive industry, as well as in the domestic and commercial refrigeration industry, production of freezers, chillers, and spray foaming activities.

Many producers in Venezuela in the above mentioned foam sub-sectors do not consume directly CFC-11. Most of them buy mixtures of polyols plus CFCs from the system house formulators and distributors of the main chemical components. CFCs are locally available mainly from PRODUVEN (the only CFC producer in Venezuela); however, some CFCs are imported through the system houses and other companies also available on the market for some factories.

The average consumption of CFC11 in the foam sector during 1995-1997 was 319 ODP tons.

The average consumption of CFC11 used in the whole applications (foam, aerosol, refrigeration and service) was 525.6 ODP tons during the same three year period.

To the end of 2000, 13 projects including one umbrella project had been approved for Venezuela in the foam sector. Nine of the projects had been completed to phase out 139.4 ODP tons, while four projects for phase out 132.2 ODP tons were still under implementation. The Table below provides a profile of the foam sector.

Status of the Foam Sector as of end of 2000

CFC11 Consumption in 2000 (ODP tones)	505
CFC11 Consumption of enterprises established after July 1995 and insulation foam for the refrigeration sector (ODP tones)	146.3
CFC11 Consumption of 27 small enterprises established before 1995 (ODP tones)	35.7
CFC11 Consumption of enterprises eligible for funding (ODP tones)	323
CFC11 Consumption approved to be phased out but not yet implemented (ODP tones)	132.2
CFC11 Consumption approved to be funded (ODP tones)	190.8
Number of eligible enterprises	23
Estimated cost of funding remaining eligible enterprises: two umbrellas and Enveta (US $)	1,251,607
Cost-effectiveness (US $/kg) average for two umbrellas and Enveta	6.2
Estimated cost for terminal project (US $)	423,500
Cost-effectiveness (US $/kg) for terminal project	11.9

In 1997, the expansion period started in the PU sector, and also the implementation of several projects in the refrigeration sector has started. Implementation of foam projects started immediately after, and in 1998 the ODS substitution by HCFC-141b was introduced in the market.

As a result of the study carried out by FONDOIN during year 2001, some 154 companies were identified in the foam sector out of which 49, small and medium enterprises, were using CFC-11 in their formulation and were established before July 1995. The rest of the identified companies started operations after consuming CFC-11 or HCFC-141b.

2.1.1 **Sectoral Analysis**

Table 1 shows the availability and consumption figures of CFC-11 in the foam sector obtained in the study performed by FONDOIN during year 2001 and the consumption figures of CF-11 reported to the MLFS since 1995.

The main discrepancy between the figures is due to the fact that until year 2000 it was assumed that the system house companies selling CFCs on the local market purchased the blowing agent from PRODUVEN only. In consequence, the figures reported to the MLFS as the country consumption were equal to the quantities produced and sold by PRODUVEN to the system house companies in Venezuela. Besides, there is about 182 ODP tons consumed in the foam sector in year 2000 mainly from factories established after 1995, very small enterprises and from the refrigeration sector for insulation of domestic, commercial and industrial refrigerators. From this last group the refrigeration sector is considered separately; the factories established

after 1995 are not fundable, so they are not included in none of the projects, and the small ones whose consumption has been estimated in 35.7 ODP tons, are included in a terminal project.

In the study carried out by FONDOIN it was ascertained that since 1998 the system house companies were importing as well CFCs from abroad through the local distributors, so that there was a discrepancy in the real CFC consumption in the country due to the imports made by some of the system house companies.

During the preparation of the study it was found out that the remaining group of the 22 factories eligible for the MLF funded is using CFC-11 (pure or pre-blended) supplied for the market mainly by the local system houses. It means that the data indicated in the columns 2 and 3 of the Table 1 are officially recorded by the national bodies concerned. The small companies have different suppliers not well known; their consumptions (35.7 ODP tons) are part of the 182 ODP tons from the last column of Table 1.

Table 1: Provision of CFC-11 for the local market, (ODP tonnes/year)

YEAR	Using CFC-11 from PRODUVEN and importers Through system houses (1)	Using CFC-11 directly from PRODUVEN without system houses (2)	Subtotal (3)=(1)+(2)	Reported to the MLF Secretariat (4)	Difference (5)= (4)-(3)
1995	211.5	88.5	300	300	0
1996	124.4	94.6	219	219 **	0
1997	333.9	105.1	439	439	0
1998	364.9	79.3	444	364	- 80
1999	315.7	29.9	345	236	-109
2000	286.3	36.7	323	505	+182*

*As for the figure of 182 ODP tons provided by the relevant national bodies and indicated in the column 5 of the Table 1 is concerned, this amount of CFC is used by the enterprises established after July 1995 and also by the very small enterprises established before 1995.

** Base line for CFC-11 in the foam sector (average 1995-1997): 319.3 ODP tons
Base line for Total CFC-11 consumption (average 1995-1997): 525.6 ODP tons.

The actual remaining consumption of CFC-11 in 2001 by the eligible group of factories, (small ones are not included) which was identified by FONDOIN, is 190.8 ODP tons. In the year 2001 the registered consumption of CFC-11 was at the level of 323 ODP tons. The reduction in consumption is due to the completion of some MLF funded projects as well as purchasing by the newly established enterprises.

Tables 2, 3 and 4 provide and illustrate that data related to the historical development and the current situation in the sector, according to the system houses information.

Table 2: CFCs consumption versus HCFC 141b in the foam sector (Tons)

Year	CFC11	HCFC 141b
1998	364.9	17.0
1999	315.7	35.4
2000	286.3	102.1

Table 2 shows that during last three years the consumption of CFCs has decreased due to the change to HCFC 141b, which is growing constantly.

Table: 3 Provision of CFC-11 and HCFC-141b formulations to the local market by the system house companies,(tones).

	Bayer			Urequímicos			Poliuretanos			Polyresin			Sinthesis			Plasquipol		
Año	R11	R141	Poliol	R11	R141	Poliol	R11	R141	Poliol	R11	R141	Poliol	R11	R141	Poliol	R11	R141	Poliol
1998	45	9	135	112	0	196	7,5	0	17,4	18,4	0	83,7	141	8	212	41	0	76,2
1999	53	19	189	98	0	172	7,8	0	18,2	8,5	0,4	27,3	90	16	141,5	58,4	0	108,5
2000	54	36	193	114	0	200	9,7	0	22,3	6,2	1,1	23,1	40	65	192,5	62,4	0	115,9

Table 3 provides data on how different system house companies are operating in the local market using their own formulations in accordance with specific requirements from customers.

It is pointed out that two system house companies started to use HCFC 141b since 1998, one company started in 1999 and the other remaining companies in 2001 or 2002.

2.1.2. Companies producing rigid PU foams

Table 4 shows the list of investment projects completed and ongoing but not implemented so far in the foam sector. This information is taken from the reports of the MLFS and from the follow up by FONDOIN.

From the study carried out by FONDOIN, it was possible to obtain a complete list of the clients of the system house companies as well as the names of companies supplying CFCs to the small enterprises. With the work performed in this study, it can be ensured that the foam sector in Venezuela has been analyzed in depth and that the information obtained is totally reliable for the implementation of the remaining activities in the country.

Table 5 summarizes the list and main baseline data of the companies producing PU foams using CFC-11 as a blowing agent, which are eligible for funding by the MLFS. These companies are candidates for future investment projects to phase-out the CFC consumption in the sector.

Table 6 summarizes the list of the small companies using CFC11 for the terminal project.

2.1.3 Technology selection and justification.

Taking into consideration current specific operational conditions of the enterprises included in the plan for conversion (low technical level of equipment and production facilities, limited financial capacities, small CFC-11 consumption that leads to the limited MLF funding, etc.), the only feasible and understandable technology option for this group is HCFC 141b.

FONDOIN and the enterprises understand very well that further conversion to an ultimate blowing technology with cero ODP will be responsibility of the enterprises under support of the Government under the frame of the SME industrial development policy.

2.2 Description of the remaining group of rigid PU foam manufacturers

The remaining group of enterprises is manufacturing the following products and components:

- insulation components for cold transportation;
- components and elements for construction of cold storages;
- insulation panels for civil and industrial construction;
- portable cold boxed for food;
- components for furniture industry;
- on-spot spray insulation for construction and food industries;
- cold display units.

Depending upon the production programs and CFC-11 consumption, the enterprises are equipped with foaming machines from DECKER, SAIP and other producers with output 40-60 Kg/ min or spray foam units from GLAS-CRAFT, GUSMER and locally made with output 6-20 Kg/ min. Some of the small and very small enterprises are using self-made mixing and pouring equipment.

The number and type of existing equipment, along with the actual CFC-11 consumption, are indicated in the list of remaining enterprises (see Tables 5 and 6.)

3. STRATEGY OF THE PLAN IMPLEMENTATION

The Government of Venezuela is committed to eliminate the CFC11 consumption in the foam sector by the end of 2005. The assistance to enterprises to phase out CFC11 is the main strategy to achieve this objective.

Based on the experience accumulated by FONDOIN so far in the implementation of similar projects, and bearing in mind the current trends and recommendations of the ExCom with regard to the sectorial or national phase out programs, it is suggested that the remaining group of rigid PU enterprises will be approached by three projects, to be submitted by UNIDO on behalf of the Government of Venezuela, and in addition to Enveta.

3.1 Phasing out of 91 ODP tons of CFC-11 from manufacturing of rigid PU foams at 11 enterprises (umbrella project).

The project will mainly cover the larger enterprises of the group in order to accelerate the overall ODS phase-out program of the country.

3.2 Phasing out of 67.8 ODP tons of CFC-11 from manufacturing of rigid PU foams at 11 enterprises (umbrella project).

3.3 Phasing out of 35.7 ODP tones of CFC11 from manufacturing of rigid PU foams at 27 very small enterprises (terminal project)

Additionally, the Government through FONDOIN, has planned to give technical assistance to the system houses and local distributors to improve the quality of the products with substitutes (HCF141b), mixtures and applications. Similar actions will be oriented to foam enterprises to improve the quality of the foam product and technical issues as densities and foam machines performances.

All of them should be informed about the phase-out policy, the national regulations and the enforcement actions to be implemented in order to comply with the Montreal Protocol and to protect the ozone layer.

These activities are close related to the approval of the umbrella and terminal projects. The Ministry of Environment will play an important role in the enforcement actions as well as the Ministry of Production and Commerce and private industrial associations in the awareness and informative activities.

Special attention will be given to the system houses in order to refrain from formulating polyol with CFC11. The offer of CFC11 will be reduced by the restriction of imports, since the national production has been already reduced.

The foam applications in the refrigeration sector should be also controlled and they will be object of the same restrictions implemented for the foam enterprises.

The very small enterprises present more difficulties to comply with the phase-out, because they are less organized and have less economic and technical resources. For the Government, the final project is strategic to get CFC11 phasing-out.

4. COST ESTIMATION CONCEPT OF THE PROGRAM

The cost estimation of the projects is based on the actual costs of the 1CC and 10C elements provided by the suppliers/producers of chemicals and machinery as following:

a) ICC project component

Retrofitting of existing

LP foaming machines $Unit	12,000 - 15,000
Replacement of existing LP foaming machines (when justified)	25,000 - 40,000 $/Unit
Replacement of existing HP foaming machines (when justified)	45,000 – 85,000 $/Unit
Retrofitting of existing LP spray foam units (imported)	2,500 $/Unit
Replacement of existing LP spray foam units (locally made)	8,000 - 12,000 $/Unit
Provision of new LP equipment in cases when the existing equipment is self-made by the enterprises (50% cost sharing by the enterprises foreseen):	
- spray machines	4,000 - 6,000 $/Unit
- foaming machines	12,500 - 20,000 $/Unit
Technical assistance (consultancy services on "know-how", engineering services for retrofitting, training, etc.)	8,000 $/per factory (average)

b) IOC project component

The IOC calculation is based on two main factors:

- difference of the market price of CFC-11 (2.1$/Kg) and HCFC-141b (3.6$/Kg);

- increase of polyol consumption (8-10%) for the same formulation due to the less content of HCFC-141b in comparison to CFC-11 based formulations.

The above prices have been used for the relevant projects recently approved for Venezuela.

5. COST EFFECTIVENESS ISSUE

In light of the respective threshold established for the rigid PU foams sector (7.83 $/Kg) and bearing in mind the considerations described in paragraph 3 above, it is expected that:

5.1 cost-effectiveness of conversion of all individual enterprises is included in the umbrella project (3.1) and the overall cost-effectiveness of the project (3.2) will be within the threshold level;

5.2 taking into consideration that the smallest enterprises will be included in the terminal project (3.3) the cost effectiveness of conversion of some of the small consuming enterprises might be above the threshold level.

6. TENTATIVE COST ESTIMATION OF THE PROGRAMME

In light of the above-described considerations, the cost of the program is estimated as follows:

Note: ENVETA project is submitted separately for an amount of US$198,882.

6.1.1 Phasing-out of 91 ODP tons of CFC-11 from rigid PU foam production at 11 enterprises

6.1.1.a) ICC component cost

	Units		US$	US$
- Replacement of existing foaming machines:	5	x	32,500	162,500
	1	x	65,000	65,000
- Retrofitting of existing spray foam machines	6	x	2,500	15,000
- Provision of new LP - foaming machines	2	x	16,000	32,000
- Technical assistance	11	x	8,000	88,000
		Subtotal:		362,500

6.1.1.b) IOC component

Price of the system as per umbrella 1 project		
Using CFC-11	=	3.67 US$/Kg
Using HCFC-141b	=	3.88 US$/Kg
Difference	=	0.21 US$/Kg
Percentage (%) of CFC-11 in foam formulation	=	13%
Average of foam production in all companies	=	
91 ODP tons of CFC-11/0.13	=	700 Mt. Of foam

Difference in price for chemicals = 700Mt. x 0.21US$/Kg = US$147,000 per year

6.1.1.c) Contingencies (10%)	50,950
Total:	**560,450**

6.2.1 Phasing out of 67.8 ODP tons of CFC-11 from rigid PU foam production at 11 enterprises.

6.2.1.a) ICC component cost

	Units		US$	US$
- Replacement of existing foaming machines	5	x	32,500	162,500
- Retrofitting of existing spray foam machines	3	x	2,500	7,500
- Provision of new LP - foaming machines	5	x	16,000	80,000
- Technical assistance	11	x	8.000	88,000
			Subtotal	338,000

6.2.1.b) 1OC component

Price of the system as per umbrella 1 project

Using CFC-11	=	3.67 US$/Kg
Using HCFC-141b	=	3.88 US$/Kg
Difference	=	0.21 US$/Kg
Percentage (%) of CFC-11 in foam formulation	=	13%
Average of foam production in all companies 67.8 ODP tones of CFC-11/0.13	=	521.54 Mt.of foam

Difference in price for chemicals = 521.5 Mt. x 0.21US$/Kg = US$109,523 per year

6.2.1.c) Contingencies	44,752
Total	**492,275**

6.3.1 Phasing out of 35.7 ODP tons of CFC-11 from rigid PU foam production at 27 enterprises.

6.3.1.a) ICC component cost

	Units		US$	US$
- Retrofitting of existing foaming machines	9	x	13,500	121,500
- Retrofitting of existing spray foam machines	9	x	2,500	17,500
- Provision of new LP - foaming machines	10	x	16,000	160,000
- Technical assistance	27	x	3,000	81,000

Subtotal	385,000
6.3.1.b) Contingencies	38,500
Total	**423,500**

The above costs of the projects (program) will be subject for re-estimation on a project-by-project basis in light of the relevant developments, decisions and guidance documents to be available before the projects formulation and submission by UNIDO.

7. ISSUE OF INDUSTRIAL RATIONALIZATION OF THE SECTOR

The relevant recommendations of the ExCom are requesting the governmental bodies and the implementing agencies concerned to apply, whenever is feasible, a concept of industrial rationalization during formulation and implementation of the umbrella projects or program for the SME sub-sectors.

The subject was thoroughly investigated by FONDOIN in light of possible technical, commercial and social impacts of such process. However, in spite of possible advantages, in the current conditions of Venezuela´s closure or consolidation (for enlargement) of private enterprises is not feasible and might cause negative social impact.

8. LEGISLATION AND POLICY MATTERS

In view of the various reasons, and constrains some inconsistency between the data on ODS consumption and reporting data occurred. It is the Government´s responsibility and commitment vis-à-vis the Montreal Protocol to elaborate, implement and enforce respective regulations to control export-import and consumption of ODS to achieve the phase-out target time. Therefore, FONDOIN and the governmental bodies concerned are in process of elaborating these documents to avoid future inconsistencies between actual and reporting data.

Nevertheless, data is not the main focus of the policy related to this plan, the principal focus is the total elimination of CFC11 consumption in the foam sector. To achieve this objective the enforcement of the regulation is a priority, but the enforcement of regulation alone is not enough. The regulation is being reviewed to include the foam sector. Awareness actions are also necessary to enforce the law and to get better results. FONDOIN will support all these activities by means of specific programs oriented to the foam sector as complement to the final project.

Table Nº 4

Investment Projects Foam Sector

	Nº.	Projects	Approved Amount (US$)	Executed Amount (US$)	ODP (Ton)	Sub-Sector Activity	Approval on	Completion by	$/Kg
Implemented	1	Decocar	$126,614	$126,614,00	16.2	Cool Stores	May-97	Nov-98	7.8
	1	Tecnofrigo	$71,946	$69,843	9	Cool Stores	Jul-98	Aug-99	7.7
	1	Fanesi	$157,882	$157,882	11.4	Furniture	Mar-99	Aug-00	13.8
	1	Fricava	$115,382	$115,382	15.3	Cool Stores	Mar-99	Aug-00	7.5
	1	Novemeca	$69,886	$69,886	16.2	Furniture	Nov-99	Jun-01	4.3
	1	Daniven	$104,030	$103,905	18	Cool Stores	May-97	Nov-98	5.7
	1	Veniber	$164,592	$159,269	21.6	Cool Stores	May-97	Nov-98	7.6
	1	Industrias Todos	$137,520	$137,520	17.8	Furniture	Nov-97	Jun-99	7.7
	1	Liderfrío	$107,850	$91,403	13.9	Construction	Nov-98	Apr-00	7.7
	9	**Subtotal : 9**	**$1,055,702**	**$1,031,704**	**139.4**				
Ongoing	1	Amerio	$88,039	$61,726	11.8	Cool Stores	Nov-99	Jun-01	7.4
	1	Nevecor	$198,374	$1,895	36.4	Construction	Jul-00	Jan-02	5.4
	1	Frío Box	$128,387	$1,895	16.5	Construction	Jul-00	Jan-02	7.7
	1	Frimac, Frizer, El Control, Incumaca, Frive, Lunger, Vanger, Refriven, Requiven, Tefiven y Ducto-panel.	$494,959	$0	67,5	Cool Stores	Jul-00	Jul-02	7.3
	4	**Subtotal : 11**	**$909,759**	**$65,516**	**132.2**				
Totals	**13**		**$1,965,461**	**$1,097,220**	**271.6**				

Table Nº. 5. Summary of list of companies using CFC-11

Nº.	*Projects*	*ODP (Ton)*	*Established year*	*Equipment*	*Capacity (Kg/min)*	*Sub-Sector / Activity*
1	Alza Astilleros	0.80	1986	L.P machine	----------	Cool stores
2	Cabicar	4.00	1984	Manual	----------	Cool stores
3	Carrocería Ureña	1.00	1993	Gusmer	6	Car industry
4	Carrocería Andina	0.30	1978	Glass-Craft	7	Car industry
5	Corporación Lelly	4.60	1965	Saip	----------	Handcraft
6	Deincopa	0.40	1962	Cannon	----------	Cool stores
7	Dureca	1.80	1982	Manual	----------	Cool stores
8	Enveta (*)	32.00	1978	Elastogram Elastogram Decker	50 50 21	Car industry
9	Extrametal	2.20	1970	COSMCC	20	Cool stores
10	Fanabus	2.40	1986	Glass-Craft	7	Car industry
11	Fanametal	13.00	1990	Saip	----------	Construction
12	Firecon	12.00	1995	Decker	40	Cool stores
13	Frimetal	1.00	1974	L.P machine	----------	Cool stores
14	Gamma	1.60	1980	Gusmer	6	Construction
15	Intercar	0.20	1992	Gusmer	6	Car industry
16	J,F y Asociados	12.00	1985	Glass-Craft Glass-Craft Glass-Craft	7 7 7	Construction
17	Medina Plásticos	13.00	1985	Gusmer Gusmer	6 6	Cool stores
18	Ofc. Técnica Calas	17.00	1987	Gusmer Gusmer	6 12	Construction
19	Polimeros Industriales	2.60	1979	Decker Decker	4 4	Food industry
20	Prointer	1.60	1972	Decker Gusmer	30 6	Car industry
21	Quooler	4.20	1988	Gusmer	20	Cool stores
22	Redupeca	0.90	1994	Manual	----------	Cool stores
23	Mercantil Speca	1.60	1981	Decker	15	Cool stores
	Sub-total	**130.20**				

* The only factory (ENVETA), included in the plan which is manufacturing moulded flexible PU foams (car seats) is also remaining. The project proposal for this factory has already been prepared and submitted by UNIDO in 2001 and discussed in general with the MLF Secretariat.

Table Nº. 6. Summary of list of companies using CFC-11

Nº.	*Projects*	*ODP (Ton)*	*Established year*	*Equipment*	*Capacity (Kg/min)*	*Activity*
1	Aislantes Ind.	4.00	1980	Manual	----------	Insulation
2	Air Gomez	6.00	1985	Decker Gusmer	30 6	Insulation
3	Cervecería Modelo	0.60	1965	Hennecke	30	Food industry
4	Cofrío	0.40	1986	Manual	----------	Cool store
5	Ebano	0.50	1990	Manual	----------	Handcraft
6	Fibro Steel	16.00	1986	OMS	100	Panels
7	Fibrepoxi	4.30	1969	Decker Decker	30 50	Cool store
8	Fibrocaven	4.10	1986	Decker Decker	15 30	Cool store
9	Grupo Celta	8.00	1987	Manual	----------	Insulation
10	Ind. Mitani	4.00	1989	Manual	----------	Handcraft
11	Ind. Ter. Cavas Ind.	1.80	1988	Manual	----------	Panels
12	Inyectofibras	4.50	1977	Manual	----------	Cool store
13	Luvitec	1.00	1991	Manual	----------	Construction
14	Mercantil Sol Aire	1.70	1993	Manual	----------	Cool store
15	Metal Nueva Cadiz	1.00	1990	Glass Kraft	7	Cool store
16	Polifibras	2.40	1989	Gusmer	10	Insulation
17	Refr. Martinez	1.00	1990	Manual	18	Cool store
18	Refr. Rodriguez	4.20	1988	Manual	----------	Cool store
19	Refricentro	2.00	1982	Decker	18	Cool store
20	Sandrin	4.00	1968	Cannon	30	Cool store
21	Siherna	1.50	1995	Manual	----------	Cool store
22	Sudameris	4.10	1974	Manual	----------	Cool store
23	Talleres Carabobo	4.50	1972	Decker Decker	16 40	Cool store
24	Talleres Martini	4.00	1980	Decker	15	Cool store
25	Talleres Roa	7.30	1993	DEC-R-Fronth	8	Insulation
26	Thermoaislantes	2.40	1990	Gusmer	6	Insulation
27	Wal Flex	1.00	1989	Manual	----------	Insulation
	Sub- total	**96.30**				
	Total	**226.50**				