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REPORT ON IMPLEMENTATION OF THE PHILIPPINES HOUSEHOLD REFRIGERATION PROJECTS

This document replaces document UNEP/OzL.Pro/ExCom/20/68, and is issued in response to decision 19/19. The document consists of the World Bank's report (Part I) and the Fund Secretariat's comments (Part II).

PART I

WORLD BANK's REPORT

REPORT ON THE IMPLEMENTATION OF THE PHILIPPINE HOUSEHOLD REFRIGERATION PROJECTS

This is the Land Bank of the Philippines' (LBP) response to the request of the Executive Committee (EC) to address issues raised by the Multilateral Fund for the Implementation of the Montreal Protocol (MFMP) Secretariat on the four Philippines Household Refrigeration projects.

The foam blowing sector of the Philippines - ODS Project has four subproject proponents namely: Concepcion Industries, Inc., Sanyo Philippines, Inc., Philippines Appliance Corporation (Philacor) and Transunion Corporation. Three of these companies; Concepcion, Sanyo and Philacor, have been fully appraised and are now implementing their production line low-CFC formulation insulating foam (Phase I) in the manufacture of household refrigerators. Late this year, both Concepcion and Sanyo will implement HCFC-141b foam insulation in their production lines.

Hereunder are LBP's responses to said comments:

To request the World Bank to prepare a report for the 20th Meeting on implementation of the project approved at the 9th Meeting for conversion of the foam part of the refrigerator manufacture by the same enterprises. The report should address issues raised in paragraph 9 of document (UNEP/OzL./ExCom/9/16/Add.1) and the conference room paper on issues identified by the Secretariat during the project review for the Philippines household refrigerator project, tabled at the meeting of the Sub-Committee on Project Review held prior to 18th Meeting of the Executive Committee. In particular, it should provide detailed information on the change of technology and consequent reallocation of major areas of expenditures so that the Executive Committee might be informed as to eligibility and the reasonableness of costs.

At the outset, it must be noted that the projects prepared in the Philippines were some of the first to be considered by the Executive Committee in the refrigeration sector and pre-date much of the guidance and templates that have since developed by the OORG. Estimates of costs for certain pieces of equipment were based on the more limited information and, in some cases, reliable technology suppliers available at the time, and may therefore be expected to have a higher margin of error than for projects prepared today. Furthermore, the selection of technical alternatives evolved from the time of project preparation to the time of project implementation (i.e., from HCFC-22/HCFC-142b to HCFC-141b), reflecting new technological developments and causing reallocation of certain expenditures. Both choices of technology represent only interim steps towards identifying zero-ODP solutions. Because of the uncertainty at the time of project approval about the long-term blowing agent of choice, each company proceeded to procure equipment that would provide them with the flexibility to accommodate either high pressure or low pressure long-term zero-ODP options. The following summarizes

both the original comments from the Secretariat and LBP's response to the issues raised by the Fund Secretariat.

(1) cost of laboratory and testing equipment requested in the four rigid polyurethane foam projects might not be incremental since such equipment was used (or should be used) by the manufacturers for 100 percent CFC-11 blown foam;

The LBP, the World Bank's local financial intermediary, concluded its appraisal for the foam component project and held meetings with each of the subproject proponents. From this it has concluded that the companies incurred greater capital costs than first anticipated as a result of their decision to convert from CFC-11 to HCFC-141b instead of HCFC-22/HCFC-142b. Constrained by the approval level of funding the companies spent less funds than expected on testing and no funds on laboratory equipment as first proposed. LBP found that Concepcion and Sanyo spent US$ 46,000 and US$ 30,000 less, respectively, than the amounts approved by the Executive Committee. These funds were returned to the Multilateral Fund prior to the 18th meeting. As part of its operating policy, prior to the release of grant funds to the project proponents, LBP will be conducting visual inspection of all procured equipment subject to reimbursement.

(ii) only equipment replacing current capacity are qualified for funding. No equipment should be procured with resources from the Fund to expand existing capacity.

As confirmed in the project appraisal reports, the grant funds are being used to replace only existing plant capacity and are not being used to cover any expenses related to plant expansion.

(iii) cost of training varied from US$ 60/day to US$ 1,300/day (in the four rigid PU foam projects) which was incongruent with the fact that the same technology would be used for the same purpose in the same country by the same implementing agency; and

The training budget covers the project proponents' conversion to the second stage alternative (i.e., HCFC-141b). Differences reflect each companies' differing state of awareness about the alternatives to CFCs in rigid foam formulation and the differing costs associated with the various types of technology transfer providers. LBP found out through its appraisal of projects that the costs of training have been lower than first proposed. As mentioned above, this has resulted in less funds being required to implement the projects which in turn has resulted in some funds being returned to the Multilateral Fund. Training is provided by the different technology suppliers and technology partners selected by each company. Part of the training consists of technology transfer regarding the new foam-blowing technology, safety, and maintenance of HCFC-141b systems. Thus far, enterprises have undertaken training on one or more of the following subjects,

foam formulation, safety, materials compatibility, dimensional stability, and shrinkage testing.

(iv) *In addition to (i) - (iii) above, recommendations cited by the OORG reviewer regarding certain aspects of technology and costs should be taken into consideration while appraising the project.*

In following the LBP's and the World Bank's competitive procurement guidelines, LBP has ensured through project appraisal that the costs of each piece of equipment for which funds disbursement is being requested are reasonable, in particular keeping in mind dynamic situation surrounding the project, and help minimize the overall costs of the phaseout in the Philippines. In the foams component conversion projects, most procurement fall into the category of requiring at least 3 quotations from suppliers in at least 2 countries. LBP is verifying that all purchased equipment is related to the phaseout of CFC-11 and is procured in accordance with the procurement guidelines, prior to the release of funds. Specific concerns were raised in the OORG review about the need and high cost of jigs and new foaming machines at Philacor. With regards to the first issue, the language of the OORG review stated, *"The major item of new cabinet jig and door jigs - 30 jigs costs US$ 2,588,000 needs detailed justification before proceeding. The cost per jigs is also high."* Such jigs were in fact necessary for the following reasons:

- Philacor's old jigs did not have heated panels to maintain the temperatures of the unfoamed cabinets during the foaming process. In its development stage, Philacor confirmed that the reduced CFC-11 blown foams as well as those blown with HCFC-141b require higher cabinet temperatures during foaming to ensure even distribution of the foam in the refrigerator cabinet, to attain even foam densities throughout the cabinet, and to minimize foam delamination problems. Full CFC-11 blown systems do not require such heated cabinets.

- The structure of the old jigs was not designed to withstand the higher pressures exerted on the jigs by the foam. HCFC-141b blown foam must be foamed at 10-15% higher densities to minimize long-term shrinkage due to solvency. Higher densities impart higher pressures and require strong jigs to maintain the refrigerator cabinet dimensions.

- Dr. Mike Jeffs, an OORG reviewer, confirmed the need for new sets of jigs during his site visit to Philacor on January 23, 1996. In his report, he stressed that the new jigs are necessary for replacement technologies. They do not constitute a production enhancement and the technical upgrade is only in line with CFC replacement. He also informed the Secretariat of the fact during a conference call on the issue. Philacor actually requires 14 units of jigs and not 30 as previously stated.

With regards to the need to procure high pressure foam injection machinery, at the time of project preparation and approval by the Multilateral Fund Executive Committee, the consensus view among technical experts was that companies in the household refrigeration manufacturing industry had two options for the intermediate blowing agent, viz. HCFC-22/HCFC-142b a high pressure alternative or HCFC-141b a low pressure alternative. Given the uncertainties that existed at the time about long-term zero-ODP choice and that the most technically advanced options was HFC-134a (a high pressure option), as detailed in the "Justification for Technology Selection" section in each of the proposals, the companies proceeded to procure high pressure foam injection machinery so as to preserve the long-term option and to gain experience in using high pressure equipment ready for the time for the final transition away from low-ODP blowing agents. Both low pressure and high pressure blowing agents can be used in the high pressure equipment but high pressure blowing agents cannot be used in low pressure equipment.

Some other reallocation of funds approved were required due to change in technology choice and the results of testing conducted during the first phase of each companies' projects. As appraised, the following annexes summarize the investment costs incurred by each company as a result of the change in the choice of technological alternative:

Annex I - Actual and Appraised Investment Cost of Philacor
Annex 2 - Actual and Appraised Investment Cost of Concepcion
Annex 3 - Actual and Appraised Investment Cost of Sanyo

We hope the foregoing explanations meet your requirements.

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ANNEX 1

ACTUAL AND APPRAISED INVESTMENT COST
PHILIPPINE APPLIANCE CORPORATION

PHASE I - REDUCTION OF CFC-11 BY 50% (ACTUAL)

A. EQUIPMENT COST

1. PUR Foam Machine for Cabinets	
o Foam Machine	$ 477,936.85
o Traverser Imported Parts	85,866.95
o Commissioning Expenses	37,910.78
o Traverser Local Parts	6,627.00
o Installation Expenses	54,181.82
o Machine Platform	47,599.60
o Chemical Drumlifter	7,054.51
Sub-total	$ 717,177.51
2. 2 sets Jigs for Cabinet Foam	
o Imported Jig (CBU)	$ 209,358.62
o Jig (CKD)	167,903.75
	$ 377,262.37
3. 3 units Pre-heat Oven	$ 28,114.54
Total Equipment Cost	$ 1,122,554.42

B. DEVELOPMENT OF 50% REDUCED CFC SYSTEM

1. Production Trial	$ 46,196.29
Total Investment Cost of Phase I	$ 1,168,750.71

PHASE II - CONVERSION FROM 50% CFC-11 TO HCFC-141B (APPRAISED)

A. ONE TIME EQUIPMENT MODIFICATION COST

1. High Pressure PUR Machine for Doors	$ 140,000.00
2. 2 sets Jigs for Door Foam	800,000.00
3. Additional 10 sets of Jigs for Cabinet Foam	1,636,602.00
4. Various Test Instruments and Gauges	124,924.00
Total Equipment Cost	$2,701,526.00

B. DEVELOPMENT OF HCFC-141b SYSTEM

1. First Production Trial	$ 6,080.00
2. Second Production Trial	54,000.00
3. Cost of Training	960.00
Total Cost	$ 61,040.00
Total Investment Cost of Phase II	$2,762,566.00

ANNEX 2

ACTUAL AND APPRAISED INVESTMENT COST
CONCEPCION INDUSTRIES, INC.

PHASE I - REDUCTION OF CFC-11 BY 50% (ACTUAL)

A. EQUIPMENT COST			
1. 4 units Pre-heaters at $35,000 @			$ 140,000.00
B. FUNCTIONAL TEST COST			
No. of units tested	: 60		
Processing Cost	: $14,449.49		
Labor Cost	: 872.72		
Testing and Dev't Cost	: 16,200.00		$ 31,522.21
C. TECHNICAL ASSISTANCE FEE			$ 7,140.00
D. PRODUCTION TRIAL			
Material Cost	: $51,043.80		
Labor Cost	: 26,181.82		
Opportunity Loss	: 40,461.12		$ 117,686.74
Total Investment Cost of Phase I			$ 296,348.95

PHASE II - CONVERSION FROM 50% CFC-11 TO HCFC-141b (APPRAISED)

A. ONE TIME EQUIPMENT MODIFICATION COSTS	
1. Modification cost for PUR foaming machine	$ 30,000.00
2. Modification cost for existing electrical/ mechanical systems requiring explosion proofing, as well as for HCFC-141b storage area, conveyance lines and foaming work area	70,000.00
3. HCFC-141b explosion proof pump, including accessories and safety gadget/equipment	10,000.00
4. Safety equipment for HCFC-141b storage foaming and curing areas, including enclosure hoodings, ductings, exhaust/ventillation fans,	

accessories, etc. (using explosion proof materials		80,000.00
5. HCFC-141b leak detection/alarm and monitoring equipment (stationary ones handheld)		50,000.00
Total Cost		$ 240,000.00

B. R & D EXPENSES

1. Inquiry and technical assistance cost from chemical supplier		$ 5,000.00
2. Processing cost		
o Foaming Section	@ $ 10/unit	
o Preparation and Final	@ $ 6/unit	
o Ave. material cost per unit	$250	
No. of model required for testing	12	
No. of unit required for testing per model	5	
Sub-total		15,960.00
3. Testing and Development cost		
No. of days	30	
Cost per day	$500	
Sub-total		15,000.00
Total R & D Expenses		$ 35,960.00

C. PRODUCTION TRIAL COST

Average material cost including painted cabinet ($17), plastic line ($14), Iso-Pol-R11-additives ($4.5) & accessories ($4.5)	$40.0/unit
Labor Cost (trial)	12.0
Labor Cost (Rework and tried units)	12.0

Cost of Opportunity loss including unaccounted losses such as elec. power, eqpt. depreciation, over-head cost, etc. at 7% of the $250 per unit mat'l & labor cost:		
o Prod. trial period = 0.07 x 250	17.5	
o Rework Period = 0.07 x 250	17.5	
Sub-total	$ 99.0/unit	
say roughly	$100.0/unit	
No. of models for trial	8	
No. of units to be tried per model	100	
Total Production Trial Cost		$ 80,000.00
D. TECHNOLOGY TRANSFER COST		90,000.00
Total Investment Cost of Phase II		$ 445,960.00

ANNEX 3

ACTUAL AND APPRAISED INVESTMENT COST
SANYO PHILIPPINES, INC.

PHASE I - REDUCTION OF CFC-11 BY 30% (ACTUAL)

A. ONE TIME EQUIPMENT COST FOR PROCESS MODIFICATION

1.	PUR Foam Machine	$ 194,433.49
2.	Chemical Storage Tank	1,240.00
3.	Rotary Gear Pump	1,403.45
4.	Cost of Labor/Materials for PUR Piping System	15,655.58
5.	Chiller for Chemical Cooling System	6,175.00
6.	Control Panel for Conveyor	8,628.01
7.	Main Circuit Breaker for PUR	2,980.42
8.	Air Compressor for PUR Machine	18,108.25
9.	Pressure Tank	10,800.00
10.	Air Drier for Air Supply of PUR Machine	4,771.15
11.	Cost of Shipping and Insurance	4,699.00
	Total Equipment Cost	$ 268,894.35

B. ONE TIME TESTING, TECHNOLOGY TRANSFER AND COST OF TRAINING

1.	Three days production trial		$ 3,810.00
2.	Overtime of Engineers		794.88
3.	Installation, Parts and Labor of the ff equipment:		
	o Chilller	$ 650	
	o Control Panel	287	
	o Main Circuit Breaker	900	
	o Air Compressor	440	
	o Pressure Tank	480	
	o Air Drier	1,431	4,188.00
4.	One-time testing of 42 units Refrigerator		3,419.00
	Total Cost		$ 12,211.88
	Total Investment Cost of Phase I		$ 281,106.23

PHASE II - CONVERSION FROM 30% CFC-11 TO HCFC-141b (APPRAISED)

A. One-time Equipment Modification Cost

1.	1-unit Overhead Conveyor	$ 111,260.00
2	1-unit Actual Check of ABS Material and Heatless Test Equipment	50,000.00
3.	Foam Melt Machine with Nitrogen Tank	27,000.00
4.	1-unit Inner Liner Jig	40,000.00
5.	1-unit Die Forming Machine	20,000.00
6.	2-units Exhaust Fan	6,000.00
	Total Equipment Cost	$ 254,260.00

B. One-time testing, technology transfer, cost of training

1.	Training of local Engineers in Japan		
	No. of Engineers to be trained	6	
	No. of days training	30	
	Cost per day of training	$180	$ 32,400.00
2.	Training of local staff by Japanese Engineers for technical process and quality check		
	No. of Japanese Engineers	2	
	No. of days	90	
	Cost per day (includes salary of $290/d; hotel of $141/d; air fare of $2,352 -round trip)	$457	82,260.00
3.	Technology Transfer, (license, technical data, technical dev't cost)		175,000.00
4.	Technical Assistance from suppliers		
	No. of days assistance	10	
	Cost per day	$1,500	15,000.00
5.	Testing of HCFC-141b prototype (include cost of materials, labor and overhead for 18 days)		
	No. of days	3	
	No. of prototype units per model	4	
	Ave. loss of revenue pe unit	$360	4,320.00

No. of days testing	18	
No. of persons performing test	6	
Cost per day	$72	7,776.00
6. Production trial		
No. of models requiring trial	3	
No. of units per model	30	
Average loss of revenue	$320	28,800.00
Total Cost		$ 345,556.00
Total Investment Cost of Phase II		$ 599,816.00

PART II

COMMENTS OF THE FUND SECRETARIAT

1. The comments of the Secretariat are intended to provide a context for the review of the Report by the Executive Committee. This is done by presenting a brief summary on the background to the Report and putting the Philippines projects into the portfolio of approved projects of the Multilateral Fund to provide a relative perspective of the aforementioned projects.

Background

2. The following is a brief summary on the background to the Report:

Approval of the foam blowing component of the four Philippines domestic refrigeration projects at the 9th Meeting of the Executive Committee (March 1993)

3. At its 9th Meeting in March 1993, the Executive Committee approved the foam blowing component of the following four domestic refrigeration projects in the Philippines for a total funding of US $3.9 million:

- Philippines Appliance Corporation Industries (Philacor)
- Concepcion Industries
- Sanyo Philippines
- Federal Electric Company

The approval was made subject to a number of issues raised at the meeting on these projects; namely:

- Cost of laboratory and testing equipment might not be incremental;
- No equipment should be procured to expand existing capacity;
- High cost of training; and
- High cost of foaming equipment such as jigs and foaming machines (as raised by the OORG technical reviewer).

Request for funding of the refrigerant component for the four projects at the 18th Meeting of the Executive Committee (November 1995)

4. A request for funding of the refrigerant component of the four projects was submitted to the 18th Meeting of the Executive Committee in November 1995, with initial results of the appraisal reports of the foaming components of the four projects. In the Conference Room Paper (CRP.2) submitted to the meeting of the Project Review Sub-Committee, the Secretariat raised

queries on the high cost of the jigs and foaming machines and recalled several of the key comments of the OORG technical reviewer at the time of project approval:

> " The major item of new cabinet and door jigs - 30 jigs costs US $2,588,000 needs detailed justification before proceeding. The cost per jig is also high. The foam injection machine costs at US $140,000 (door) and US $182,000 (cabinet) are also high. The recently reviewed Ecuador project dispensers were quoted at ca. US $120,000 and in the reviewer's experience the current price of a basic high pressure dispensing machine is less than US $100,000 without accessories." (OORG Technical Review, January 1993)

These projects were deferred by the 18th Meeting of the Executive Committee " due to a lack of advance information."

> Approval of the refrigerant component of two of the projects and a request for reporting at the 19th Meeting of the Executive Committee (May 1996)

5. The Executive Committee approved US $952,000 for the refrigerant component at Philacor and Concepcion and, at the same time, requested:

> " ...the World Bank to prepare a report for the 20th Meeting on implementation of the project approved at the 9th Meeting for conversion of the foam part of the refrigerator manufacture by the same enterprises. The report should address issues raised in paragraph 9 of document (UNEP/OzL.Pro/ExCom/9/16/Add.1) and the conference room paper on issues identified by the Secretariat during the project review for the Philippines household refrigerator project, tabled at the meeting of the Sub-Committee on Project Review held prior to the 18th Meeting of the Executive Committee. In particular, it should provide detailed information on the change of technology and consequent reallocation of major areas of expenditures so that the Executive Committee might be informed as to eligibility and the reasonableness of costs" (UNEP/OzL.Pro/ExCom/19/64, Decision 19/19).

A relative perspective

6. As stated in the beginning of this note, this section attempts to provide a relative assessment of the costing of the foam blowing component of the Philippines projects against projects of similar technical configuration approved to date under the Multilateral Fund. Since the three Philippines projects illustrated below propose to use HCFC-141b as a foam blowing technology, the comparison is made with similar approved projects applying the same technology.

7. The table below is designed as follows:

Cost item:	As listed in the project document submitted to the 9th Meeting.
Cost requested:	Cost requested in the project document approved at 9th Meeting.
Appraised expenditure:	Actual expenditures included in the appraisal report.
Typical cost	Typical cost of the item from other approved projects of the Multilateral Fund in 1993-1994.
Difference (4-3)	Difference between the appraised expenditure and the typical cost of the item from projects approved in 1993-1994.
Remarks	Related comments.

Conclusion

8. The results of the comparisons described in paragraphs 6 and 7 above are as follows:

(a) Philacor's appraised expenditure is US $1,056,005 more than similar projects.

(b) Concepcion's appraised expenditure is US $565,589 more than similar projects.

(c) Sanyo's appraised expenditure is US $549,809 more than similar projects.

TABLE 1						
Company	**Cost Item** **1**	**Cost Requested** **2**	**Appraised Expenditure** **3**	**Typical Cost** **4**	**Difference (3-4)** **5**	**Remarks** **6**
			(US $)			
Philacor						
	Foam injection machine (cabinet)	182,000	717,177	100,000	617,177	OORG Technical reviewer's estimate <US $100,000. According to information from foaming equipment suppliers, the cost of foaming machine with all accessories designed for HCFC-22/142b; high pressure system at 100 bars would be about US $120,000. Cost of a foaming machine for HCFC-141b is up to US $100,000.
	High pressure PUR machine for doors	140,000	140,000	90,000	50,000	
	Jigs for cabinet foam	1,778,000 for 14 units @127,000/ unit	2,013,864 for 12 units @167,822 /unit	1,020,000 for 12 units @ 85,000/unit (maximum) Water heated universal cabinet fixture with universal expandable plug suitable for all sizes of cabinets with automatic opening. Also suitable for cyclopentane operation.	993,864 for 12 units @ 82,822 difference per unit.	OORG technical reviewer indicated that cost of jig is high. None of the HCFC-based projects approved so far requested replacement of foaming jigs. Comparison is made on the basis of cost for new jigs requested for cyclopentane operation. Cost of cyclopentane based jigs is higher due to incorporated safety features. Even so, the cost per unit as appraised is significantly higher. This reinforces what the OORG technical reviewer said about the high cost of jigs.
	Jigs for door foam	800,000 for 16 units @ 50,000 per unit	800,000 for 2 sets of jigs @ 400,000 per set	368,000 for 16 units @ 23,000/unit (maximum) electrically heated jigs designed for cyclopentane	432,000 for 16 units @ 377,000 per unit	(comment as above)

TABLE 1						
Company	**Cost Item** 1	**Cost Requested** 2	**Appraised Expenditure** 3	**Typical Cost** 4	**Difference (3-4)** 5	**Remarks** 6
	Pre-heating oven	0	28,114	20,000-35,000 (28,114 is accepted)	0	Pre-heating oven was not included in the original budget. Pre-heating oven may be necessary. Cost is reasonable.
	Production trial for 50% reduced CFC system (4 models, 50 units per model)	57,504	46,196	8,000	38,196	The standard cost of trial is US $2,000 per model. Trial cost would be US $8,000 for 4 models.
	Production trial of HCFC-141b system (4 models, 50 units per model)	51,684	60,060	8,000	52,060	Comment as above.
	Testing and laboratory equipment (k-factor machines) Analytical balance Viscometer Grant water bath Gas chromatograph Pycnometers (4) Compressive strength tester)	104,452	124,924	13,000	111,924	Most of testing equipment required for testing of rigid polyurethane foam should be available at the enterprise since it is used with CFC-11 based foam. Majority of projects on conversion to HCFC-141b technology have never requested any funds for foam testing and laboratory equipment. In two projects, foam testing kits were requested at US 13,000. In one project for Sanyo Thailand approved at the 10th Meeting, US $40,000 has been requested for insulation conductivity tester (k-factor machine). Expenditures appraised at US $124,924 are in contradiction with the statement in paragraph (1) on page 2 "companies spent less funds than expected on testing and no funds on laboratory equipment as first proposed."
	Cost of training	1,800	960	0	0	Training of personnel is usually part of trial process. Cost of training has been combined with trial cost in many projects. If requested separately cost of training is in the range of US $5,000 - US $15,000. Cost is reasonable.

TABLE 1						
Company	**Cost Item** **1**	**Cost Requested** **2**	**Appraised Expenditure** **3**	**Typical Cost** **4**	**Difference (3-4)** **5**	**Remarks** **6**
	Cost of piping for blowing agent	5,000	0	0	0	Cost is not incurred.
	Easy-froth metering system	113,000	0	0	0	Not needed for HCFC-141b technology
	High pressure storage tank	10,000	0	0	0	Not needed for HCFC-141b technology
	TOTAL:	**3,243,440**	**3,937,316**	**1,636,074 + 15% contingency Total 1,880,4850**	**2,517,221**	**The total difference between appraised expenditures and typical costs of the same budget items as approved in similar projects is US $2,517,221**
	Allocations Approved at the 9th Meeting	**1,770,000**				**Grant amount is calculated taking into account operating savings for 50% CFC-11 reduced formulation (Phase I) at US $710,000 and 39% of foreign ownership. Grant amount includes 15% contingency and 3% for financial intermediary fee.**
	Grant amount calculated on the basis of typical project cost.			**715,995**		**Typical project cost reduced by US $710,000 of operating savings and by 39% due to foreign ownership.**
	Difference between approved allocations and new calculated grant.				**1,056,005**	**Compared with a similar project calculated at typical cost, the project is US $1,056,005 more expensive.**
Concepcion						
	Pre-heating oven	0	140,000 4 units @ 35,000	70,000	70,000	Pre-heating oven may be necessary. Cost per unit is reasonable. Number of units required is not explained. Typically up to two ovens have been required in projects approved.
	Foam injection machine	150,000	30,000 modif. Of existing machines	5,000	25,000	Foaming machine can be modified for the use of HCFC-141b blowing agent at cost of about US $5,000 as demonstrated in several projects approved.

TABLE 1

Company	Cost Item 1	Cost Requested 2	Appraised Expenditure 3	Typical Cost 4	Difference (3-4) 5	Remarks 6
	Mixing unit	80,000	0	0	0	Not needed. HCFC-141b based formulation is available in the pre-blended form. Cost is not incurred.
	High pressure storage tank	30,000	0	0	0	Not needed for HCFC-141b technology. Cost is not incurred.
	Piping for blowing agent	5,000	0	0	0	Not needed. Existing piping can be used for HCFC-141b blowing agent. Cost is not incurred.
	Insulation conductivity meter	15,000	0	0	0	Cost is not incurred.
	Pilot line equipment with lab testing foaming fixture	450,000	0	0	0	OORG technical reviewer believes costs are highly excessive. No costs are incurred.
	Cost of trials a) 50% reduced CFC-11 b) HCFC-141b blowing agent	 4,000 2 units per each of 8 models 4,000 2 units per each of 8 models	 117,686 80,000	 24,000 at $3,000 per model 24,000 at $3,000 per model	 93.686 56,000	Typical cost is US $2,000 to $3,000 per model as requested in projects at that time. This project trial costs are calculated at US $14,710 and US $10,000 per model.
	Cost of testing and development a) 50% reduced CFC-11 b) HCFC-141b blowing agent	 15,000 15,000	 31,522 39,960	 31,522 39,960	 0 0	Typical cost of testing and development as requested in projects at that time is about US $4,000 per model. Testing and development costs are in line with other projects.
	Cost of training a) 50% reduced CFC-11 (Phase I) b) HCFC-141b blowing agent	 20,800 20,800	 0 0		 0 0	Cost of training was not incurred.

TABLE 1						
Company	**Cost Item** **1**	**Cost Requested** **2**	**Appraised Expenditure** **3**	**Typical Cost** **4**	**Difference (3-4)** **5**	**Remarks** **6**
	(Phase II)					
	Technical assistance	0	7,140 technical assistance	7,140	0	Costs of technical assistance and technology transfer are reasonable.
	Technology transfer cost	0	90,000	90,000	0	Cost of technology transfer is subject to the agreement between technology supplier and the enterprise.
	Cost of modification for ex-proofing storage area, foaming area and conveyor, HCFC-141b pump	0	80,000	0	80,000	HCFC-141b is moderately flammable, with no flash point. It is used preblended with polyol and poses no safety problems in terms of flammability. Safety equipment has never been requested in any HCFC-141b based project submitted to the Executive Committee. Such safety related equipment is applicable for highly flammable hydrocarbon blowing agents (e.g. cyclopentane)
	Safety equipment Exhaust/ventilation/enclosure in foaming/curing area for use of HCFC-141b	0	80,000	0	80,000	Comments as above.
	HCFC-141b leak detection/ alarm system	0	50,000	0	50,000	Comments as above.
	TOTAL:	**809,600**	**476,308**	**291,662 + 15% Contingency Total 335,411**	**454,646**	**The total difference between appraised expenditures and typical costs of the same budget items as approved in similar projects is US $454,646**

TABLE 1						
Company	**Cost Item** 1	**Cost Requested** 2	**Appraised Expenditure** 3	**Typical Cost** 4	**Difference (3-4)** 5	**Remarks** 6
	Allocations Approved	**790,000**				**Grant amount is calculated taking into account operating savings for 50% CFC-11 reduced formulation (Phase I) at US $113,000. Grant amount includes 15% contingency and 3% of financial intermediary fee.**
	Grant amount calculated on the basis of typical project cost.			**224,411**		**Typical project cost reduced by US $113,000 of operating savings.**
	Difference between approved allocations and new calculated grant.				**565,589**	**Compared with a similar project calculated at typical cost, the project is US $565,589 more expensive.**
Sanyo Philippines						
	Foam injection machine with accessories. (Rotary gear pump, chiller for chemical cooling system, compressor for foam machine, pressure tank air dryer for foaming machine at US $44,237)	182,000	243,371	100,000	143,371	Comments of OORG technical reviewer regarding the cost of foaming machines are applicable to this budget item as well. All the accessories are part of standard HCFC-141b foaming machine and included in US $100,000 cost..
	High pressure storage tank	10,000	1,240	0	1,240	No additional storage tank is required for HCFC-141b technology.
	Control panel for conveyor	0	8,628	0	8,628	Normally not needed for conversion to HCFC-141b.
	Cost of piping	5,000	15,655	0	15,655	This cost is usually included in installation cost.
	Installation cost	0	4,188	4,188	0	Cost is justifiable.
	Pilot line Lab testing leaking fixture, cabinet jig fixtures and testing equipment	470,000	0	0	0	Costs are not incurred. Equipment is not needed for the conversion.

TABLE 1						
Company	**Cost Item** **1**	**Cost Requested** **2**	**Appraised Expenditure** **3**	**Typical Cost** **4**	**Difference (3-4)** **5**	**Remarks** **6**
	Cost of production trial testing and training 50% reduced CFC-11	15,750	8,023	0	0	Costs are comparable with other projects.
	Cost of training	6,000	114,660	10,000	104,660	Cost of training is very expensive. Cost of training includes travel to Japan of 6 engineers for 36 days.
	Technology transfer and technical assistance from supplier	1,500	190,000	25,000	165,000	Standard cost for HCFC-141b technology transfer is US $25,000, including technical assistance from machinery and HCFC-141b system suppliers.
	Trials and testing for 3 models	12,000	40,896	9,000 @ 3,000 per model	31,896	Standard cost for trials and testing are based on US $3,000 per model requested on projects approved at that time.
	Cost associated with modification and procurement of plastic forming such as overhead conveyor, test equipment, machine die forming machine	0	254,260	0	254,260	Plastic forming equipment has never been requested by refrigerator companies. Existing equipment can be used with new plastic material for inner liner.
	TOTAL:	**810,000**	**880,922**	**148,188 + 15% Contingency Total 170,416**	**732,734**	**The total difference between appraised expenditures and typical costs of the same budget items as approved in similar projects is US $732,734**
	Allocations Approved	**660,000**				**Grant amount is calculated taking into account operating savings for 50% CFC-11 reduced formulation (Phase I) at US $13,000 and 30% foreign ownership. Grant amount includes 15% contingency and 3% financial intermediary fee.**
	Grant amount calculated on the basis of typical project			**110,191**		**Typical project cost reduced by US $13,000 of operating savings.**

TABLE 1						
Company	**Cost Item** **1**	**Cost Requested** **2**	**Appraised Expenditure** **3**	**Typical Cost** **4**	**Difference (3-4)** **5**	**Remarks** **6**
	cost.					
	Difference between approved allocations and new calculated grant.				**549,809**	**Compared with a similar project calculated at typical cost, the project is US $549,809 more expensive.**