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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-eighth Meeting
Montreal, 14-16 July 1999

PROJECT PROPOSALS: MALAYSIA

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

Foam

- Retroactive project for phasing-out ODS consumption in the manufacture of cold room panels by conversion to HCFC-141b at FMCP Sdn. Bhd. — UNDP
- Phase-out of CFC-11 in the manufacture of cold room panels and insulation slabs by conversion to HCFC-141b at PKL Insulation. — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam (spray and blocks) at Polyedge Trading — UNDP
- Phase-out of CFC-11 and R502 consumption at Thermo Cooling Engineering SDN. BHD. — UNDP
- Phase-out of CFC-11 by conversion to HCFC-141b technology at automated Plastic System Sdn. Bhd. in the manufacture of insulated fishing bosex — UNIDO
- Phase-out CFC-11 consumption at Chong Brother Group of Companies — UNIDO
- Phase out of CFC-11 consumption by conversion to HCFC-141b at Perniagaan Hower in the manufacture of sandwich panels — UNIDO

PROJECT EVALUATION SHEET
MALAYSIA

SECTOR: Foam ODS use in sector (Baseline): 690 ODP tonnes Sub-sector cost-effectiveness thresholds: Rigid US $7.83/kg

Project Titles:

(a) Retroactive project for phasing-out ODS consumption in the manufacture of cold room panels by conversion to HCFC-141b at FMCP Sdn. Bhd.
(b) Phase-out of CFC-11 in the manufacture of cold room panels and insulation slabs by conversion to HCFC-141b at PKL Insulation.
(c) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam (spray and blocks) at Polyedge Trading
(d) Phase-out of CFC-11 and R502 consumption at Thermo Cooling Engineering SDN. BHD.
(e) Phase-out of CFC-11 by conversion to HCFC-141b technology at Automated Plastics System Sdn. Bhd. In the manufacture of insulated fishing boxes
(f) Phase-out CFC-11 consumption at Chong Brother Group of Companies
(g) Phase out of CFC-11 consumption by conversion to HCFC-141b at Perniagaan Hower in the manufacture of sandwich panels

Project Data	**Rigid**						
	FMCP	**PKL**	**Polyedge**	**Thermo Cooling**	**Automated Plastics**	**Chong Bros.**	**Perniagaan**
Enterprise consumption (ODP tonnes)	13.30	9.00	11.30	6.50	5.76	30.70	5.80
Project impact (ODP tonnes)	12.20	8.10	10.30	6.00	5.20	27.60	5.30
Project duration (months)	30	30	30	30		24	
Initial amount requested (US $)	95,385	63,595	80,650	90,332	61,048	313,033	62,222
Final project cost (US $):							
Incremental capital cost (a)	20,000	35,000	124,000	60,000	61,000	175,000	50,750
Contingency cost (b)	2,000	3,500	12,400	6,000	6,100	17,500	5,075
Incremental operating cost (c)	23,557	18,519	10,840	11,484	22,018	102,933	9,338
Total project cost (a+b+c)	45,557	57,019	147,240	77,484	89,118	295,433	65,163
Local ownership (%)	100%	100%	100%	100%	58%	100%	100%
Export component (%)	0%	0%	0%	0%	0%	0%	0%
Amount requested (US $)	45,557	57,019	80,650	46,502	40,716	216,108	41,499
Cost effectiveness (US $/kg.)	3.74	7.02	7.83	7.83	7.83	7.83	7.83
Counterpart funding confirmed?	Yes	Yes	Yes	Yes		Yes	
National coordinating agency	Department of Environment						
Implementing agency	UNDP	UNDP	UNDP	UNDP	UNIDO	UNIDO	UNIDO
Secretariat's Recommendations							
Amount recommended (US $)	45,557	57,019	80,650	46,502	40,716	216,108	41,499
Project impact (ODP tonnes)	12.20	8.10	10.30	5.93	5.20	27.60	5.30
Cost effectiveness (US $/kg)	3.74	7.02	7.83	7.83	7.83	7.83	7.83
Implementing agency support cost (US $)	5,922	7,412	10,485	6,045	5,293	28,094	5,395
Total cost to Multilateral Fund (US $)	51,479	64,431	91,135	52,547	46,009	244,202	46,894

PROJECT DESCRIPTION

(a) Retroactive project for phasing-out ODS consumption in the manufacture of cold room panels by conversion to HCFC-141b at FMCP Sdn. Bhd.

(b) Phase-out of CFC-11 in the manufacture of cold room panels and insulation slabs by conversion to HCFC-141b at PKL Insulation.

(c) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam (spray and blocks) at Polyedge Trading

(d) Phase-out of CFC-11 and R502 consumption at Thermo Cooling Engineering Sdn. Bhd.

(e) Project to phase-out the use of CFC-11 by conversion to HCFC-41b technology in the manufacture of insulated fishing boxes at Automated Plastic System Sdn. Bhd.

(f) Phase-out CFC-11 consumption at Chong Brother Group of Companies

(g) Phase-out of CFC-11 consumption by conversion to HCFC-141b in the manufacture of sandwich panels at Perniagaan Hower.

Sector Background

- Latest available total ODS consumption (1997)		3,659.3	ODP tonnes
- Baseline consumption* of Annex A Group I substances (CFCs)		3,271.1	ODP tonnes
- 1998 consumption of Annex A Group I substances		Not reported	
- Baseline consumption of CFCs in foam sector		690.8	ODP tonnes
- 1998 consumption of CFCs in foam sector		384	ODP tonnes
- Funds approved for investment projects in foam sector as of March 1999 (27th Meeting)	US $	10,978,935	
- Quantity of CFC to be phased out in foam sector as of March 1999 (27th Meeting)		1,586	ODP tonnes
- Quantity of CFC phased out in foam sector as of March 1999 (27th Meeting)		1,021	ODP tonnes

*Baseline consumption of Annex A controlled substances refers to average of the consumption for the years 1995-1997 inclusive.

Other relevant information:

1. Seven projects are being submitted to the 28th Executive Committee Meeting in the foam sector. When approved and implemented 78.3 ODP tonnes of CFC-11 will be phased out.

Impact of Project (s)

2. The 78.3 tonnes to be phased out constitutes 2.4 per cent of Malaysia's baseline consumption of Annex A Group I substances and 11.3% of its foam sector baseline consumption. There will be a residual ODP of 7.7 ODP tonnes due to the use of HCFC-141b as substitute blowing agent.

Justification for the Use of HCFC-141b

3. All seven Malaysian companies will convert their production to HCFC-141b technology. Justification for the use of HCFC-141b based on technical and economic analysis of the available technologies has been provided in each project. The agreement of the Government on use HCFC-141b has been expressed in a letter from the Ministry of Science, Technology and Environment in accordance with Executive Committee Decision 27/13. This is attached as Annex I to the evaluation.

(a) Retroactive project for phasing-out ODS consumption in the manufacture of cold room panels by conversion to HCFC-141b at FMCP SDN. BHD.

4. FMCP Sdn. Bhd. manufactures rigid polyurethane foam for sandwich panels required for cold room construction and for insulation of the commercial refrigerator cabinets. FMCP replaced their manual foam mixing and pouring operation by purchasing a low pressure OMS FM 110 foaming machine in 1997. This foaming machine is especially designed for the HCFC 141b duty.

5. FMCP used average of 13.3 ODP tonnes of CFC-11 in 1996-1998. The project for FMCP Sdn. Bhd. insulation will phase-out the use of 12.2 ODP tonnes of CFC through replacement with HCFC 141b.

6. The project costs includes the reimbursement of the existing low pressure foam dispenser at a cost of US $40,000. Reimbursement of the air compressor and compressed air supply system at a cost of US $8,000, reimbursement of the electricity supply upgrade at a cost of US $3,000. Funds are also requested for training (US $5,000), test trials related to formulation optimization (US $5,000), and technology transfer/technical assistance (US $10,000), all associated with the new foam technology.

(b) Phase-out of CFC-11 in the manufacture of cold room panels and insulation slabs by conversion to HCFC-141b at PKL Insulation.

7. The enterprise PKL Insulation is one of the manufacturers of cold room panels in Malaysia. Production volume in 1998 was 2,007 m3 of Polyurethane foam. The selected CFC replacement technology is HCFC 141b to replace CFC 11.

8. PKL used 9 ODP tonnes of CFC-11 in 1998. The project will phase out the use of 8.1 ODP tonnes of CFCs.

9. The enterprise has one high-pressure foam dispenser (80 Kg/min) which will be retrofitted at a cost of US $25,000. Funds are also requested for training (US $5,000), test trials related to formulation optimization (US $5,000), and technology transfer/technical assistance" (US $10,000), all associated with the new foam technology.

(c) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam (spray and blocks) at Polyedge Trading

10. Polyedge Trading Sdn Bhd used 11.3 tonnes of CFC-11 (average 1996-1998) in the manufacture of rigid polyurethane sprayfoam and boxfoam for insulation applications. The production is to be converted to HCFC-141b technology as an interim solution. The company operates one 100 kg/min Viking low pressure machine installed in 1980, a Gusmer FF-1000 and a Gusmer FF-1600 commissioned in 1985 and 1994 respectively. The project includes replacement of the Viking LP and Gusmer FF-1000 by one 100 kg/min high pressure dispenser (US $110,000) and one low output high pressure spray/pour-in-place dispenser (US $25,000) respectively, as well as retrofit of the Gusmer FF-1600 dispenser. Other costs include trials (US $10,000), training and technology transfer (US $10,000) and contingency (US $16,000). The cost of the replacement machines were discounted for old age. The project also has incremental operating costs for two years of US $10,840.

(d) Phase-out of CFC-11 and R502 consumption at Thermo Cooling Engineering Sdn. Bhd.

11. This project will phase out 6 ODP tonnes of CFC-11 consumption in the manufacture of polurethane insulation panels to be used in the installation of cold rooms and cold storages at Thermo Cooling Engineering Sdn. Bhd.. It will be achieved by converting foam operations (CFC-11) to HCFC-141b technology. The refrigeration operations will be eliminated with replacement of R-502 with HCFC-22. The enterprise operates two stationary hand mixers. There are also three oyster-type presses, two horizontal door presses, four vacuum pumps, and four manifold and hose sets. The hand mixers will be replaced while the vacuum pumps will be retrofitted. The manifold and hose set will be replaced and scrapped. The project will include incremental capital costs covering one low high pressure foaming machine (US $40,000), one air compressor and a compressed air supply system (US $8,000), electricity upgrade (US $3,000), training (US $5,000), trials and optimisation (US $5,000), technology transfer/technical assistance (US $10,000) and. The total incremental operating costs amount to US $19,575 based on 2 years duration.

(e) Project to phase-out the use of CFC-11 by conversion to HCFC-41b technology in the manufacture of insulated fishing boxes at Automated Plastic System Sdn. Bhd.

12. Automated Plastics System Sdn. Bhd. is a joint venture founded in 1992 with 58% national ownership and 42% Australian. It manufactures plastic thermal insulated boxes for fishery industries, ice cube industries, food stalls and leisure activities. The foam is produced by hand mixing technique. The project will phase out the use of 5.2 tonnes of CFCs out of the 5.76 ODP tonnes used in 1998. The selected CFC replacement technology is HCFC-141b. The project includes the purchase of a high pressure foam dispenser of the required capacity (20 kg/min) for insulated plastic foaming operation at a cost of US $48,000. Funds are also requested for training (US $3,000), test trials related to formulation optimization (US $3,000), and technology transfer/technical assistance (US $7,000), all associated with the new foam technology. The cost of the foam dispenser is discounted for lack of a machine in the baseline.

(f) Phase-out CFC-11 consumption at Chong Brothers Group of Companies

13. This project will phase out 27.6 ODP tonnes of CFC consumption in the production of polyurethane insulation panels cold rooms, freezers, and chillers at Chong Brother Group of Companies. It will be achieved by converting foam operations (CFC-11) to HCFC-141b technology. The enterprise operates five stationary hand mixers. There are also four vertical presses, four vacuum pumps, and two manifold and hose sets. The project will include incremental capital costs covering two high pressure foaming machines (US $200,000), two air compressors and a compressed air supply system (US $16,000), electricity upgrade (US $6,000), training (US $7,000), trials and optimisation (US $7,000), technology transfer/technical assistance (US $15,000) and. The total incremental operating costs amount to US $59,157 based on 2 years duration.

(g) Phase-out of CFC-11 consumption by conversion to HCFC-141b in the manufacture of sandwich panels at Perniagaan Hower.

14. Perniagaan Hower is a 100% nationally owned Malaysian company which was founded in 1989. It manufactures panels for cold rooms and deep freezers. The foam panels are produced by hand mixing and hand pouring. The project will phase out the use of 5.3 ODP tonnes CFC out of 5.8 ODP tonnes used in 1998. The selected CFC replacement technology is HCFC-141b. The project includes the purchase of a low pressure foam dispenser of the required capacity (120 kg/min) for panel foaming operation at a cost of US $45,000. Air compressor and compressed air supply system for the low pressure foaming machine operation at a cost of US $4,000 and electrical supply system upgrade within the foaming areas at a cost of US $3,000. Funds are also requested for training (US $3,000), test trials related to formulation optimization (US $3,000), and technology transfer/technical assistance (US $7,000). The cost of the foam dispenser is discounted for lack of a machine in the baseline.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Fund Secretariat and the implementing agencies (UNDP and UNIDO) discussed the projects.

FMCP (UNDP)

2. With regard to the request for retroactive funding for the new low pressure dispenser purchased and installed in 1997 to process CFC-based formulations, UNDP was advised that since the dispenser did not phase out CFC, costs associated with it are not eligible for retroactive funding. The dispenser was purchased by the company to upgrade its manual operations to the standard process for CFC-based production. Consequently, the eligible costs were determined to be as follows:

- Incremental capital cost	US $20,000
(trials, training and technology transfer)	US $2,000
- Incremental operating cost	US $23,557
Total project cost	US $45,557

3. The amount of US $45,557 was agreed as the eligible grant.

PKL (UNDP)

4. The Fund Secretariat and UNDP agreed on US $15,00 as retrofit costs instead of US $25,000 originally proposed. The total project cost became US $57,019, made up of US $38,500 incremental capital cost and US $18,519 incremental operating cost.

Polyedge Trading (UNDP)

5. The Fund Secretariat and UNDP agreed on the cost of the project (US $80,650)

Perniagaan Hower, Automated Plastics System (UNIDO)

6. The Fund Secretariat and UNIDO discussed and agreed on the project costs. The cost of electricity upgrade for US $3,000 in each project was not considered as eligible incremental cost. The following project costs were agreed.

Perniagaan Hower:	US $41,499
Automated Plastics Systems	US $40,716

Thermo Cooling Engineering SDN

7. The objective of the project is to phase out consumption of CFC-11 in manufacturing polyurethane insulation panels. The ODP consumption in refrigerant operations is negligible (85 ODP kg of R-502) which will be reduced by 70 ODP kg using HCFC-22 refrigerant. The issue of classification of this project was discussed with UNDP. The project was classified as belonging to rigid foam sector. Subsequently the cost-effectiveness threshold of US $7.83 has been applied for calculation of the eligible level of grant.

Chong Brothers Group Companies

8. The project has been initially submitted under commercial refrigerant sector. The company is involved in production of polyurethane insulation panels which are used by customers of Chong Brother company in installation of cold rooms and for other applications. The project was reclassified by UNIDO as a rigid foam project. The eligible level of grant has been determined using the cost-effectiveness threshold of US $7.83/kg ODP.

9. The Secretariat has also discussed with UNIDO the eligible incremental cost of high pressure machine which will replace manual foam operations. The capital costs have been adjusted to account for the technological upgrade.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the Automated Plastics Systems, Chong Brothers, FMCP, Perniagaan Hower, PKL, Polyedge and Thermo Cooling projects with the funding levels and associated support costs indicated in the table below.

	Project Title	Project Cost (US$)	Support Cost (US$)	Implementing Agency
(a)	Retroactive project for phasing-out ODS consumption in the manufacture of cold room panels by conversion to HCFC-141b at FMCP Sdn. Bhd.	45,557	5,922	UNDP
(b)	Phase-out of CFC-11 in the manufacture of cold room panels and insulation slabs by conversion to HCFC-141b at PKL Insulation.	57,019	7,412	UNDP
(c)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam (spray and blocks) at Polyedge Trading	80,650	10,485	UNDP
(d)	Phase-out of CFC-11 and R502 consumption at Thermo Cooling Engineering SDN. BHD.	46,502	6,045	UNDP
(e)	Phase-out of CFC-11 by conversion to HCFC-141b technology at Automated Plastics System Sdn. Bhd. In the manufacture of insulated fishing boxes	40,716	5,293	UNIDO
(f)	Phase-out CFC-11 consumption at Chong Brother Group of Companies	216,108	28,094	UNIDO
(g)	Phase out of CFC-11 consumption by conversion to HCFC-141b at Perniagaan Hower in the manufacture of sandwich panels	41,499	5,395	UNIDO