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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-first Meeting
Geneva, 5-7 July 2000

PROJECT PROPOSALS: MALAYSIA

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

Foam

•	Conversion from CFC-11 to LCD technology in the manufacture of flexible molded foam at Pointray	UNDP
•	Conversion from CFC-11 to LCD (liquid carbon dioxide) and water-based technology in the manufacture of flexible molded foam at Unique Field	UNDP
•	Conversion from CFC-11 to LIA technology in the manufacture of flexible polyurethane boxfoam, and to LCD technology in the manufacture of flexible molded foam at Sy Heng Huat	UNDP

PROJECT EVALUATION SHEET
MALAYSIA

SECTOR: Foam ODS use in sector (1998): 384 ODP tonnes

Sub-sector cost-effectiveness thresholds: Integral skin US $16.86/kg

Project Titles:

(a) Conversion from CFC-11 to LCD technology in the manufacture of flexible molded foam at Pointray

(b) Conversion from CFC-11 to LCD (liquid carbon dioxide) and water-based technology in the manufacture of flexible molded foam at Unique Field

(c) Conversion from CFC-11 to LIA technology in the manufacture of flexible polyurethane boxfoam, and to LCD technology in the manufacture of flexible molded foam at Sy Heng Huat

Project Data	**Integral skin**		**Multiple-subsectors**
	Pointray	**Unique Field**	**Sy Heng Huat**
Enterprise consumption (ODP tonnes)	24.30	18.50	46.20
Project impact (ODP tonnes)	24.30	18.50	46.20
Project duration (months)	36	36	36
Initial amount requested (US $)	209,500	214,500	347,437
Final project cost (US $):			
Incremental capital cost (a)	235,000	205,000	340,000
Contingency cost (b)	23,500	20,500	34,000
Incremental operating cost (c)	-49,000	-11,000	-26,563
Total project cost (a+b+c)	209,500	214,500	347,437
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
Amount requested (US $)	209,500	214,500	347,437
Cost effectiveness (US $/kg.)	8.62	11.59	7.52
Counterpart funding confirmed?			Yes
National coordinating agency	Department of Environment		
Implementing agency	UNDP		

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

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1998)	2,639.10 ODP tonnes
- Baseline consumption of Annex A Group I substances (CFCs)	3,271.10 ODP tonnes
- Consumption of Annex A Group I substances for the year 1998	2,333.70 ODP tonnes
- Baseline consumption of CFCs in foam sector	690.80 ODP tonnes
- Consumption of CFCs in foam sector in 1998	384.00 ODP tonnes
- Funds approved for investment projects in foam sector as of end of 1999	US $12,066,646.00
- Quantity of CFC to be phased out in investment projects in foam sector as of end of 1999	1,702.99 ODP tonnes
- Quantity of CFC phased out in investment projects in foam sector as of end of 1999	1,465.80 ODP tonnes
- Quantity of CFC to be phased out in investment projects in foam sector approved in 1999	125.00 ODP tonnes
- Funds approved for investment projects in the foam sector in 1999	$1,188,084.00

Flexible Molded/Integral Skin Foam

1. Pointray, Unique Field and Sy Heng Huat produce flexible molded polyurethane foams for the furniture and automotive industries. The details per company are shown in table 1 below. Also shown in table 1 are the densities of the foam produced by the companies as well as their existing equipment.

2. Unique Field operates two production plants, one of which is using two low pressure dispensers while the other is using a high pressure dispenser. Sy Heng Huat also produces flexible slabstock foam. It is proposed to convert the production of two of the companies and one plant of Unique Field to LCD technology. The other plant at Unique Field will be converted to water-blown.

3. The cost of conversion to LCD involves the replacement of the exiting low pressure dispensers with high pressure dispensers with direct injection of LCD at US $170,000 per dispenser, LCD storage and transfer system at US $30,000, civil works at US $5,000, trials at US $10,000 and technology transfer and training at US $20,000 per project. The trials and technology transfer and training costs for both conversion technologies at Unique Field, i.e. LCD and water-blown will be US $10,000 an US $20,000 respectively. Each LCD project will realize incremental operational savings for two years as follows: Pointray: US $49,000; Unique Field: US $11,000; and Sy Heng Huat: US $45,900.

4. Alternative calculations for water-blown technology have been made in an annex to each project document to provide justification for the choice of LCD as the technology with lower cost (than the water-blown). In these calculations it is claimed that the densities of foam produced by Sy Heng Huat and Unique Field need to be increased as follows, resulting in high incremental operational cost to the companies:

Sy Heng Huat	52%	(from 31.5kg/m^3 to 48kg/m^3)
Unique Field	20%	(from 40kg/m^3 to 48kg/m^3)

5. The costs of water-blown technology of the two projects based on these foam density increases are as follows:

Company	Incremental Capital Cost (US$)	Incremental Operational Cost (US$)	Total Project Cost (US$)
Sy Heng Huat	**44,000**	**896,935**	**940,935**
Unique Field	**33,000**	**305,000**	**338,000**

6. The other production line at Unique Field which will be converted to water-blown technology will incur incremental capital costs associated only with trials and technology transfer and training of a total of about US $15,000. It will however incur incremental operational cost of US $12,500, resulting in a total project cost of about US $27,500.

7. The profile of the companies is shown in Table 1 below.

Table 1: Profile of Flexible Molded Foam Producing Companies

Company	CFC Consumption (Tonnes)	Products Manufactured	Foam Density (kg/m^3)	Existing Equipment and Capacity	Proposed Conversion Technology	Total cost of Project (US $)
Pointray	24.3	Mattresses, pillow, seat cushions	38-51	1994 LP Cannon C-100FL2, 100 kg/min	LCD	209,500
Unique Field	18.5	Motorcycle and car seats and back cushions, headrests	35-40 (back cushions, 45-50 (headrests and seat cushions)	1983 Cannon LP C-40 (40 kg/min) Viking LP, 30 kg/min 1980 (refurbished 1994) HP Kraus Maffei, 40 kg/min	LCD and water	214,500
Sy Heng Huat	23.1	Mattresses, pillows, furniture cushions	28-35	1993 Cannon C-100 FL2	LCD	247,690

Multiple Sub-Sector

8. Sy Heng Huat produces flexible slabstock boxfoam in addition to the flexible molded foam described in paragraphs above. It produces seven grades of foam, all of which are said to be of density below 10 kg/m^3. It produces the foam using a locally made boxfoam equipment with three cutting carousels for fabrication. The boxfoam will be converted to low index additive (LIA) technology. The capital cost includes the replacement of the boxfoam with semi-automatic unit (US $95,000), trials and technology transfer and training (about US $24,000). Incremental operational cost for four years of US $19,337 will be incurred.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Flexible molded foam

1. The Executive Committee's decision relating to conversion of flexible molded foams provides enterprises freedom of choice of conversion technology between two technological options, namely LCD and water-blown. However the eligible grant should be based on the option with lower conversion costs. The incremental capital costs of the two alternative technological options, i.e., water-blown and LCD, were determined to be as follows:

Company	**Incremental Capital cost (US $) (Including 10% contingency)**	
	Water Blown	**LCD**
Sy Heng Huat	**44,000**	**247,500**
Unique Field	**33,000**	**258,500**

2. Agreement has not been reached on the calculation of incremental operational costs resulting from the use of water-blown technology. Hence the total project cost of the water-blown option could not be determined to enable determination of the lower cost technology.

3. In the two projects, Sy Heng Huat and Unique Field, where increases in foam density of 52% and 20% respectively are claimed, resulting in incremental operational cost for 2 years of US $896,935 and US $305,000 respectively, the additional amounts to the incremental operational costs due to the claimed increases in density are US $814,320 and US $182,700 respectively. The Fund Secretariat was advised by industry experts consulted that those levels of incremental operational costs are not realistic and not consistent with industry practice and that the systems suppliers should be able to supply systems to fit the existing machines' capabilities and produce water-blown flexible molded foams of lower density than the densities claimed in the projects. The experts pointed out that the Canon machines used by the companies, some of

which are relatively new (1993-1994), facilitate conversion to water-blown technology. They further added that it would be inappropriate for the Multilateral Fund to destroy such relatively new and efficient machines which with some assistance from the companies' systems suppliers could function well for the production of water-blown foams at reasonable cost.

4. The projects are under discussion between the Fund Secretariat and UNDP. However, the outcome of the discussions would depend on the decision of the Executive Committee on how to deal with the issue of foam density in rigid and flexible molded foam projects. The two projects are submitted for individual consideration.

Pointray

5. The Fund Secretariat and UNDP agreed on the incremental capital cost, based on which the project costs were calculated as follows:

Incremental capital cost:	US $33,000
Incremental operational cost (including 8% increase in foam density):	US $166,240
Incremental operational cost (excluding 8% increase in foam density):	US $86,896
Total Project cost (with density increase):	US $199,240
Total Project cost (without density increase):	US $121,896

6. The project is submitted for individual consideration on account of the cost associated with the claim of 8% increase in foam density amounting to US $79,344.

Multiple subsector

7. The Fund Secretariat and UNDP agreed on the cost of the boxfoam component of the Sy Heng Huat project. However, the approval of this component should be subject to approval of the entire project for the company in view of the linkages in the incremental capital costs of the two components of the project.