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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-fifth Meeting
Montreal, 29-31 July 1998

PROJECT PROPOSALS: MALAYSIA

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

Foam

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| • Conversion to water based and HCFC-141b technology in the manufacture of polyurethane foam at Grorich | UNDP |
| • Conversion to water based and HCFC-141b technology in the manufacture of polyurethane foam at Minply | UNDP |
| • Conversion to LCD technology in the manufacture of polyurethane foam at Tenaga | UNDP |

PROJECT EVALUATION SHEET MALAYSIA

SECTOR: FOAM ODS use in sector (1993): 1360 ODP tonnes

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

Project Titles:

- (a) Conversion to Water Based HCFC-141b Technology in the Manufacture of Polyurethane Foam at Grorich.
- (b) Conversion to Water Based and HCFC-141b Technology in the Manufacture of Polyurethane Foam at Minply.
- (c) Conversion to LCD Technology in the Manufacture of Polyurethane Foam at Tenaga.

Project Data	Integral Skin		
	Grorich	Minply	Tenaga
ODS phase-out (ODP tonnes)	32.9	16.5	23
Proposed project duration (months)	24	24	24
Incremental capital cost (US \$)	198,000	200,750	357,500
- including contingency (%)	10	10	10
Incremental operational cost (US \$)	37,750	18,900	(48,700)
Total project cost (US \$)	235,750	219,650	308,800
Local ownership (%)	100	100	100
Export component (%)			
Amount requested (US \$) {Original}	235,750	219,650	308,800
{Revised}			
Cost effectiveness (US \$/kg)	7.16	13.31	13.43
National Coordinating Agency	Department of Environment (DOE)		
Implementing Agency	UNDP		
Technical review completed?	Yes	Yes	Yes

Secretariat's Recommendations:			
Amount recommended (US \$)			308,800
Project impact (ODP tonnes)			23
Cost effectiveness (US \$/kg)			13.43
Implementing Agency support cost (US \$)			40,144
Total cost to Multilateral Fund (US \$)			348,944

PROJECT DESCRIPTION

- (a) Conversion to Water Based HCFC-141b Technology in the Manufacture of Polyurethane Foam at Grorich.
 - (b) Conversion to Water Based and HCFC-141b Technology in the Manufacture of Polyurethane Foam at Minply.
 - (c) Conversion to LCD Technology in the Manufacture of Polyurethane Foam at Tenaga.
1. The use of ODS in the foam sector in Malaysia grew from 590 tonnes ODP in 1989 to 1360 tonnes ODP in 1993. The country programme update indicated the year 2000 as the phase out date for CFCs and halon. The most recent information provided by the Government as part of its report on the progress of implementation of Malaysia's Country Programme indicates the consumption in the foam sector for 1997 as 662 tonnes ODP.
 2. It states that in the pursuit to meet the target phase out date of year 2000, Malaysia has outlined the strategy and policy to reduce consumption and to restrict the usage of CFCs in manufacturing sector such as in foam making and aerosol. Application Permit System (AP) has been introduced since April 1994 with reduced quota set every year.
 3. According to the Government's report, Malaysia has received funding from the Multilateral Fund of the Montreal Protocol to implement 106 phase out projects and activities that are targeted to phase out 4,595 metric tonnes by end of 1999. As of June 1998, 67 projects and activities had been completed that phased out more than 2,200 MT of CFCs. It is anticipated that Malaysia can achieve the targeted phase out date of year 2000 in the manufacturing sector provided that all investment projects will be completed in time by end of 1999. However, the present economic situation may have some adverse effects on the project implementation as many industries will have to slow down on capital investment and delay the project completion.
 4. Three integral skin polyurethane foam projects of a total cost of US \$764,200 are being submitted for Malaysia. However UNDPs 1998 business plan allocates 543,000 for the foam sector. (The total allocation for Malaysia is US \$943,000 consisting of US \$543,000 for rigid foam and US \$400,000 for fumigant. No project for fumigant is being presented at the 25th Meeting.)
 5. The three companies for which projects are being prepared are all 100% Malaysian-owned. Grorich started its polyurethane foam operation in 1994. There is no information on the commencement of operations of the other two companies (Minply and Tenaga). The three projects will phase out 72 tonnes ODP of CFC-11.
 6. The justification for use of HCFC-141b is provided in the overview on selection of technology. Letters from the companies indicating their acceptance of the project, their commitment to provide necessary counterpart funding, use HCFCs only to the extent stipulated, completely phase out the use of CFCs, destroy replaced equipment and to allow monitoring inspections by UNDP during project implementation, are attached to the project documents.

7. No information was provided on how long Grorich and Minply intended to use the HCFC-141b as a transitional blowing agent.

- (a) **Conversion to Water Based HCFC-141b Technology in the Manufacture of Polyurethane Foam at Grorich.**
 (b) **Conversion to Water Based and HCFC-141b Technology in the Manufacture of Polyurethane Foam at Minply.**

1. The two companies manufacture artistic charm moldings, some of which are high density rigid polyurethane molded in the same way as integral skin. Grorich also produces imitation wood. Grorich and Minply used 34 tonnes and 17 tonnes of CFC-11 respectively in 1996. Their respective baseline's are as follows:

Grorich: Two 35 kg/min (SEM) low pressure machines, one of which was installed in 1997.
 Minply: One 80kg/min Puromat 80p QS high pressure machine.

2. The two companies have chosen to convert to water-based technology to the extent possible supplemented by HCFC-141b. The capital cost items requested are as follows.

Grorich	US \$	Minply	US \$
Low pressure dispenser		High pressure dispenser retrofit	45,000
Retrofit	20,000	1 multi-component premixer	85,000
1 Multi-component premixer	85,000	Reclamping of 90 molds @ \$250	22,500
1 intermediate tank	20,000		
Reclamping of 200 molds @ US \$100	20,000		

3. The justification for requesting the multi-component premixer are as follows. In the case of Grorich it is stated that the company uses varying levels of blowing agent in its formulations and the premixer will enable it to customize its formulations. In the case of Minply the reason given is that the company uses three different systems through one dispenser and the dedicated systems supplier, (Elastogran) does not supply premixed material. Incremental operating costs of Grorich and Minply are US \$37,750 and US \$18,900 respectively.

- (c) **Conversion to LCD Technology in the Manufacture of Polyurethane Foam at Tenaga.**

1. The company is one of the registered government suppliers of mattresses, pillows and cushions for the military, hospitals, etc. It provides mattresses of density 34 kg/m³ and pillows of density 23-25 kg/m³. It used 23 tonnes of CFC-11 in 1996. The baseline equipment consists of a 100 kg/min Cannon C-100 (1981) and a 60 kg/min Cannon A-60 (1994).
2. The company will phase out the use of CFC-11 by converting to liquid carbon dioxide (LCD) technology. The capital cost of the project includes the retrofit of the Cannon A-60 for direct LCD and the replacement of the Cannon C-100 low pressure machine with a 60 kg/min high pressure machine with direct LCD. Trials, technology transfer and training

amount to US \$40,000. The project also includes incremental operating saving for two years of US \$48,700.

3. UNDP has calculated the costs of using alternative conversion option of water blown technology to demonstrate the comparative cost-effectiveness of the two options in line with Executive Committee decision 24/58 relating to the selection of technology for flexible molded foam projects.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Grorich, Minply

1. The Secretariat requested UNDP to indicate how long the two companies, Grorich and Minply intended to use HCFC-141b in line with the Executive Committee decision 23/20 (2b), UNDP could not provide the information.
2. With regard to the request for multi-component premixers (with intermediate tank in one case), the Secretariat was advised that these are not necessitated by the change to HCFC, they would constitute technology and capacity upgrade and would not be eligible. The issue is elaborated in detail in the Secretariat's Overview Paper. Other costs of the projects - dispenser retrofits and reclamping of molds - have been agreed.
3. The Secretariat and UNDP are discussing the outstanding issues. The outcomes of the discussion will be communicated to the Sub-Committee on Project Review.

Tenaga

4. The Secretariat was advised that the foam density of 23-25 kg/m³ would not be achievable with water-blown systems and may not be achievable with current LCD technology. However LCD provides the best prospects for the company to achieve similar products and would also be a cheaper technology than water-blown.

RECOMMENDATION(S)

1. The Fund Secretariat recommends blanket approval of the Tenaga project with the level of funding and associated support cost as indicated below.

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
Conversion to Water Based HCFC-141b Technology in the Manufacture of Polyurethane Foam at Grorich	Pending	Pending	UNDP
Conversion to Water Based and HCFC-141b Technology in the Manufacture of Polyurethane Foam at Minply	Pending	Pending	UNDP
Conversion to LCD Technology in the Manufacture of Polyurethane Foam at Tenaga	308,800	40,144	UNDP