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Executive Committee of
the Multilateral Fund for the
Implementation of the Montreal Protocol

Twenty-second Meeting
Nairobi, 28-30 May 1997

PROJECT PROPOSALS: THAILAND

This document includes the comments and recommendations from the Fund Secretariat on the following projects:

Foam

- | | |
|---|------|
| • Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Siriphan | UNDP |
| • Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Asia Container | UNDP |
| • Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Ocean Plastics | UNDP |
| • Conversion to CFC-free technology in the manufacture of rigid and integral skin polyurethane foam at Bangkok Foam Group | UNDP |

Refrigeration

- | | |
|--|------------|
| • Conversion of compressor manufacture from CFC-12 to HFC-134a designs at Sanyo Universal Electric Co. Ltd. | World Bank |
| • Conversion of compressor manufacture from CFC-12 to HFC-134a, Phase 2 at Kulthorn Kirby Public Company Limited | World Bank |

PROJECT EVALUATION SHEET THAILAND

SECTOR: Foams ODS use in sector (1991: 1,510 ODP tonnes

Sub-sector cost-effectiveness thresholds: General 9.53 US \$/kg

Project Titles:

- (a) Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Siriphan.
- (b) Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Asia Container.
- (c) Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Ocean Plastics.
- (d) Conversion to CFC-free technology in the manufacture of rigid and integral skin polyurethane foam at Bangkok Foam Group.

Project Data	Rigid			General
	Siriphan	Asia Container	Ocean Plastics	Bangkok Foam Group
ODS phase-out (ODP tonnes)	55	45	89	90.6
Proposed project duration (Yrs)	2	1.5	2	1.5
Incremental capital cost (US \$)	85,500	93,500	175,000	555,000
Contingency (%)	10	10	10	10
Incremental operational cost (US \$)	121,000	105,500	94,500	167,000
Total project cost (US \$)	215,000	199,000	287,000	722,000
Local ownership (%)	100	100	100	75.5
Export component (%)	-	-	-	51 ¹
Amount requested (US \$) {Original}	215,000	210,000	287,000	501,500
{Revised}		199,000		480,500
Cost effectiveness (US \$/kg)	4.30	4.42	3.50	5.30
National Coordinating Agency	Hazardous Substances Control Division Department of Industrial Works (DIW)			
Implementing Agency	UNDP			
Technical review completed?	Yes	Yes	Yes	Yes

Secretariat's Recommendations:				
Amount recommended (US \$)	215,000	199,000	287,000	480,500
Project impact (ODP tonnes)	50	45	82	90.6
Cost effectiveness (US \$/kg)	4.30	4.42	3.5	5.30
Implementing Agency support cost (US \$)	27,950	25,870	37,310	62,465
Total cost to Multilateral Fund (US \$)	242,950	224,870	324,310	542,965

¹ Foreign participation affects only part of the project

PROJECT DESCRIPTION

At the four enterprises (Siriphan, Asia Container, Ocean Plastics and Bangkok Foam Group) production is to be converted to water blown formulations, preceded by HCFC-141b as an interim step. Each project includes equipment replacement, as well as trials, training, technology transfer, contingency and incremental operational costs.

- (a) Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Siriphan.

1. Siriphan will phase out the use of 50 ODP tonnes of CFC-11 in the manufacture of rigid foam for cold box and container insulations. The company currently uses the following equipment: locally made stationary mixer.

2. The main costs of the project are as follows:

High pressure dispenser	US \$70,000
Technology transfer, trials and training	15,500
Incremental operational cost	121,000

- (b) Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Asia Container.

3. Asia Container will phase out the use of 45 ODP tonnes of CFC-11 in the manufacture of rigid foam for cold box and container insulations. The company currently uses the following equipment: locally made stationary mixer.

4. The original costs of the project were as follows:

High pressure dispenser	US \$70,000
Technology transfer, trials and training	25,000
Incremental operational cost	105,500

- (c) Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Ocean Plastics.

5. Ocean Plastics will phase out the use of 82 ODP tonnes of CFC-11 in the manufacture of rigid foam for cold box and container insulations, and fishing buoys. The company currently uses the following equipment: LF-7M-30P medium pressure dispenser; output 12 kg/min and a locally made stationary mixer.

6. The main costs of the project are as follows:

High pressure dispenser	US \$100,000
Premixer	60,000
Technology transfer, trials and training	15,000
Incremental operational cost	94,500

- (d) Conversion to CFC-free technology in the manufacture of rigid and integral skin polyurethane foam at Bangkok Foam Group.

7. Bangkok Foam Group will phase out the use of 90.6 ODP tonnes of CFC-11 in the manufacture of rigid and integral foam for pipe segments, block foam and spray foam as well as flexible slabstock and flexible molded foam. The company currently uses a variety of low and high pressure machines for various foam manufacturing activities, depending on foam type.

8. The original costs of the project were as follows:

	US \$
2 high pressure dispensers 20 kg/min.	260,000
1 high pressure dispenser 160 kg/min	130,000
5 variable ratio dispensers	100,000
1 premixer	60,000
Technology transfer, trials and training	180,000
Incremental operational cost	45,000

9. The spray foam activity is 100% Thai-owned while there is 51% foreign ownership in the integral skin and rigid foam manufacture.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Rigid Foam

1. The Fund Secretariat and UNDP agreed on the project costs of Siriphan and Ocean Plastics. In the case of Asia Containers the cost of trials was agreed at US \$10,000 instead of US \$20,000 due to the range of products of the company.

General Foam

2. Bangkok Foam Group: The four tanks/ pumps were not considered as eligible incremental cost, while for the block foam 1 high pressure dispenser of 140 kg/min., rather than

160 kg/min. at US \$120,000 was agreed as the eligible incremental cost. The incremental capital cost was therefore incremental cost. The incremental capital cost was therefore revised to US \$555,000 instead of US \$599,000.

3. The 49% foreign ownership was discounted from the project cost of the integral skin, molded and block foam components of the project.

Impact of Projects on the 1999 Freeze

4. The project documents indicate that approval of the projects would eliminate substantial quantities of ODS which would make significant contribution to enable Thailand to meet its obligations under the Montreal Protocol commencing in 1999.

RECOMMENDATION

1. The Fund Secretariat recommends that the projects be given blanket approval at the funding level indicated in the table below.

	<u>Project Title</u>	<u>Project Cost</u> US \$	<u>Support</u> <u>Cost US \$</u>	<u>Implementing</u> <u>Agency</u>
(a)	Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Siriphan.	215,000	27,950	UNDP
(b)	Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Asia Container.	199,000	25,870	UNDP
(c)	Conversion to CFC-free technology in the manufacture of rigid polyurethane foam at Ocean Plastics.	287,000	37,310	UNDP
d)	Conversion to CFC-free technology in the manufacture of rigid and integral skin polyurethane foam at Bangkok Foam Group	480,500	62,465	UNDP

PROJECT EVALUATION SHEET **THAILAND**

SECTOR: Refrigeration ODS use in sector N/A ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A

Project Titles:

- (a) Conversion of compressor manufacture from CFC-12 to HFC-134a designs at Sanyo Universal Electric Co. Ltd.
- (b) Conversion of compressor manufacture from CFC-12 to HFC-134a, Phase 2 at Kulthorn Kirby Company Limited

Project Data	Compressor	
	Sanyo Universal	Kulthorn Kirby
ODS phase-out (ODP tonnes)	N/A	N/A
Proposed project duration (Yrs)	0.5	1
Incremental capital cost (US\$)	N/A	N/A
Contingency (%)		
Incremental operational cost (US\$)	577,500	457,050
Total project cost (US\$)	N/A	
Local ownership (%)	65	70
Export component (%)	25	25
Amount requested (US\$) { Original	577,500	457,050
{ Revised		
Cost effectiveness (US\$/kg)	N/A	N/A
National Coordinating Agency	Department of Industrial Work	Department of Industrial Work
Implementing Agency	World Bank	World Bank
Technical review completed?	Yes	Yes

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

PROJECT DESCRIPTION

- (a) Conversion of compressor manufacture from CFC-12 to HFC-134a designs at Sanyo Universal Electric Co. Ltd.
- (b) Conversion of compressor manufacture from CFC-12 to HFC-134a, Phase 2 at Kulthorn Kirby Company Limited

1. The two projects were submitted as Phase I and II and approved at the 10th and 20th Meetings of the Executive Committee .

2. Regarding the request for incremental operating costs, the Executive Committee decided at its 20th Meeting that:

“To request the Secretariat and the World Bank to work together to develop a procedure for dealing with operating costs in this particular case” (UNEP/OzL.Pro/ExCom/20”72, Decision 20/27).

3. The World Bank is requesting approval of the incremental operating cost for the two enterprises. Incremental operating costs have been calculated using US \$1.54 per compressor as cost of lubricant, taking into account the savings from the cleaning process. The number of units produced by the two enterprises have been discounted for export to Article 2 countries being 2,025,000 units. Incremental operating costs are requested for a six month duration, taking into account foreign ownership as follows:

Sanyo Universal Electric Co. Ltd.	US \$577,500
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Kulthorn Kirby Public Co. Ltd.	US 457,050
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SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The strategy for the refrigeration sector has been prepared and submitted by the Government of Thailand to the Secretariat. The number of compressors supplied by the two compressor companies for domestic use including domestic and commercial refrigerators has been determined at the level of 1,740,000 in 1995 which is a lower number than one used in the World Bank's calculations.

2. The Secretariat is submitting the paper included in document UNEP/OzL.Pro/ExCom/22/73 where the issue of incremental operating costs for compressor conversion is discussed.

RECOMMENDATIONS

1. Pending a decision on the policy paper.

	Project Cost US \$	Support Cost US \$	Implementing Agency
(a) Conversion of compressor manufacture from CFC-12 to HFC-134a designs at Sanyo Universal Electric Co. Ltd.			World Bank
(b) Conversion of compressor manufacture from CFC-12 to HFC-134a, Phase 2 at Kulthorn Kirby Company Limited			World Bank