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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
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Thirty-first Meeting
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TECHNICAL STUDY ON FOAM DENSITY

(NOTE FROM THE SECRETARIAT)

Introduction

1. This note is being provided to inform the Executive Committee about progress with the technical study on foam density. The Secretariat regrets the late preparation of the note, but delayed its finalisation in an attempt to have all relevant implementing agencies agree on a package of findings and recommendations to the Executive Committee. This has not been possible. The findings and recommendations of the final draft of the report on foam density are attached for the information of the Committee (Annex I). The complete final draft of the study can be made available to members of the Executive Committee on request.

Background

2. At the 29th Meeting, 20 projects were approved provisionally on the understanding that no funds should be disbursed pending the determination of the incremental operating costs associated with foam density. In Decision 29/22, the Executive Committee requested the Fund Secretariat and the Implementing Agencies to resolve the technical issues on foam density by jointly undertaking a technical study based on the information from implemented Multilateral Fund Projects and report back to the Sub-Committee at the time of the Thirtieth Meeting of the Executive Committee on the understanding that the Chair and Vice Chair of the Executive Committee would be kept informed of any progress made with the study.

3. At the 30th Meeting the Executive Committee decided to await the completion of the study before reconsidering the relevant projects and to urge the Secretariat and the implementing agencies to ensure that the study would be completed for submission to the Executive Committee at its 31st Meeting (Decision 30/55).

Action taken

4. Following the 29th Meeting, detailed terms of reference, drafted initially by the Secretariat were agreed between the Secretariat and the implementing agencies as a basis for the study. It was also agreed that the Foam Sector Working Group of the World Bank's Ozone Operations Resource Group (the OORG) should be requested to undertake the study, in part since the findings of the Working Group's initial study conducted in 1998 and 1999 had prompted the current considerations on foam density.

5. The Foam Sector Working Group commenced its study upon receipt of data from implementing agencies and has produced three draft reports which have been commented on by the Secretariat and relevant implementing agencies. Various amendments and explanations which addressed the concerns raised and which presented the findings of working group and the technical basis for them more clearly, were incorporated in successive drafts.

6. In a conference call on 23 June 2000, the Secretariat proposed that the findings and recommendations be submitted to the Executive Committee as the basis for dealing

with foam density in Multilateral Fund Projects for a period of 18 months. In doing so, the Secretariat noted that the Secretariat and various agencies had different perspectives on the individual findings in the report but that overall the report was robust and, taken as a package, represented a sound basis for moving forward. UNDP was unable to agree to this proposal, following which further clarifications were sought from the OORG Foam Sector Working Group. A fourth, and final, draft report was prepared for distribution by the World Bank on 27 July 1999. The Secretariat and relevant agencies were consulted on the final draft, however UNDP again found itself unable to commit to the package of findings and recommendations.

ANNEX I

CONCLUSIONS AND RECOMMENDATIONS

1) The information and guidance contained in this report should be shared with all the implementing agencies.

2) Rigid polyurethane insulation foam projects should be based on the definitions of market segments as defined in Table 1.

3) For each MLF project the overall densities of the foams in the baseline case and with the alternative technologies should be determined using ISO 845. This will enable the data bank to be expanded and enhanced.

4) The density changes applied in rigid polyurethane insulating foam projects should follow the values listed in Table 3.

5) Where enterprises are operating, in the baseline case, at lower densities than those listed in Table 3 the percentage increases in density should be applied.

6) For rigid polyurethane foam projects where incremental operating costs in are given for two years the first year should be based on the "start-up" density and the second year on the "mature" density. For those projects where incremental operating costs are met for six months then the "start-up" density should be used.

7) For flexible moulded foam, where the technology to replace CFC-11 is invariably $C0_2$ (water) blown there is no increase in density. However, formulations might need to be changed to maintain performance/OEM specifications, but no general rules can be drawn up regarding formulation changes.

8) For integral skin products, this segment is best considered on a case by case basis.

9) The Working Group should be reconvened when it is deemed necessary so that it can update its findings.

And some concluding remarks:

This study is extremely important for the cost effective phase-out of ODS in foam projects. The TOR was broad in concept and this report attempts to present the findings in a clear and concise fashion.

The data input was based on two sources. The first was from a study of data from MLF projects provided by UNDP and The World Bank. The second was the experience (a total of 146 years) and on-going learning of the members of the Foams Working Group. Both sources are invaluable.

It is inevitable that further information would have enhanced the data bank but is unlikely to have changed the conclusions.

TABLE 1 – RIGID POLYURETHANE FOAM SEGMENTATION

SEGMENT	SUB-SEGMENT	COMMENTS
THERMOWARE	Picnic boxes	e.g. as made by Rubbermaid and Coleman
	Insulated food dishes & bottles	
PIPE INSULATION	Pipe sections	Moulded sections
		Sections cut from blocks
	Pipe-in-pipe	For DCH (District heating pipes)
DISCONTINUOUS BOARDS & BLOCKS	Boards	
	Blocks	Used for several applications including pipe sections & panels
CONTINUOUS BOARDS & BLOCKS	Flexible-faced laminates/boardstock	Major insulation product in developed countries
	Blocks	Rigid slabstock used for pipe sections and panels, etc.
DOMESTIC REFRIGERATORS & FREEZERS		
COMMERCIAL REFRIGERATORS & FREEZERS	Vending machines	Self-service can drink dispensers
	Visi-coolers	Glass-fronted drink coolers
	Display cases	Used in retail outlets
	Chest freezers	Used in retail outlets
	Walk-in/step-in coolers/freezers	Storage in supermarkets, typically made from discontinuously-made sandwich panels
CONTINUOUS PANELS		For cladding, warehouses, cold stores, industrial buildings
DISCONTINUOUS PANELS		Uses as for continuous panels plus doors and commercial refrigeration
SPRAY FOAMS	Walls	Interior & exterior walls
	Roofs	For new and renovation applications
	Pipes and Tanks	For hot and cold applications

For non-insulating polyurethane foams the sub-segments are:

TABLE 2 – FLEXIBLE MOULDED FOAM SEGMENTATION

SEGMENT	SUB-SEGMENTS	COMMENTS
FLEXIBLE MOULDED FOAM – TRANSPORTATION	Seat backs	All follow specifications of the OEMs
	Seat cushions	
	Headrests	
	Saddles	For motorcycles
FLEXIBLE MOULDED FOAM – FURNITURE		
FLEXIBLE INTEGRAL SKIN FOAMS – TRANSPORTATION	Steering Wheels, armrests	
	Fascias	
	Bicycle saddles	
RIGID INTEGRAL SKIN	Furniture	Typically wood imitation mouldings
	Electrical and electronic cases	

TABLE 3 – DENSITIES FOR RIGID POLYURETHANE FOAMS

SEGMENT	SUB-SEGMENT	BASELINE DENSITY	ALTERNATIVE TECHNOLOGY	START-UP DENSITY (%)	MATURE DENSITY (%)
THERMOWARE	Picnic boxes	32-34	HCFC 141b	35-37 (9)	32-34 (0)
	Insulated dishes	32-34	HCFC 141b	35-37 (9)	32-34 (0)
PIPE INSULATION	Pipe sections	33-35	HCFC 141b	35-37 (6)	34-36 (3)
	Pipe-in-pipe	70-80	HCFC 141b & pentane	70-80 (0)	70-80 (0)
DISCONTINUOUS BOARDS & BLOCKS	Boards	35-37	HCFC 141b	38-40 (8)	36-38 (3)
	Blocks	33-34	HCFC 141b	36-37 (9)	34-35 (3)
CONTINUOUS BOARDS	Boards	30-32	HCFC 141b, pentane	33-35 (10) 35-37 (16)	31-33 (3) 34-36 (13)
DOMESTIC REFRIGERATOR/ FREEZERS		31-33	Cyclopentane Cyclo/iso pentane HCFC 141b	36-38 (16) 34-36 (10) 35-37 (13)	34-36 (10) 34-35 (8) 33-35 (6)
COMMERCIAL REFRIGERATORS & FREEZERS	Vending machines	33-35	HCFC 141b	36-38 (9)	35-37 (6)
	Visi-coolers	33-35	HCFC 141b	36-38 (9)	35-37 (6)
	Display cases	36-38	HCFC 141b	38-40 (5)	37-39 (3)
	Chest freezers	36-38	HCFC 141b	38-40 (5)	37-39 (3)
	Walk-in/step-in coolers/freezers	41-44	HCFC 141b	43-45 (4)	41-44 (0)
CONTINUOUS PANELS		40-42	HCFC 141b, Pentane	42-44 (5)	40-42 (0)
DISCONTINUOUS PANELS		41-44	HCFC 141b, Pentane, HFC 134a	43-45 (4)	41-44 (0)
SPRAY FOAMS	Walls	32-35	HCFC 141b	34-37 (6)	33-36 (3)
	Roofs	48-50	HCFC 141b	48-50 (0)	48-50 (0)
	Pipes & tanks	32-35	HCFC 141b	34-37 (6)	33-36 (3)