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ORIGINAL: ENGLISH

EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Thirty-fourth Meeting  
Montreal, 18-20 July 2001

**STATUS REPORT ON THE STUDY OF ALTERNATIVES TO  
CFCs IN RIGID FOAM APPLICATIONS**

1. In Decision 31/49, the Executive Committee approved the terms of reference for a study on CFC alternatives in the manufacture of rigid foam. Under the terms of reference the Secretariat is required to contract for the services of a qualified independent consultant experienced in conducting economic evaluations at the enterprise level and familiar with conversions to related technologies to carry out the study.
2. In October 2000, the Secretariat advertised internationally for expressions of interest in conducting the study, without satisfactory results. Subsequently the Secretariat approached suitably qualified individuals and consulting companies about conducting the study. This approach proved to be successful. Three proposals were received and evaluated in accordance with United Nations procedures. On 29 May 2001 a contract in the amount of US \$75,000 was let to Wakim Consulting of San Francisco California to undertake the study. Wakim Consulting has assembled a team of four consultants with the required experience.
3. Work on the study has commenced and a draft report is planned to be available in late July 2001. The workplan for the study appears in Annex I. Visits are planned to projects in three countries representing the three major geographical areas. In Argentina and Egypt, both hydrocarbon and HCFC-141b technologies have been implemented. In Malaysia, only non-hydrocarbon technologies have been implemented. The visit to Malaysia will enable assessment of why hydrocarbon technologies were not used, in a country which had the necessary infrastructure and which had chosen hydrocarbons in other sectors. Visits will be preceded and supplemented by questionnaires to over 100 enterprises with an appropriate representation of

countries, technologies and enterprise sizes. A copy of the proposed questionnaire is contained in Annex II.

4. On the basis of the above process it is planned to submit the final study report with documentation for the 35<sup>th</sup> Meeting of the Executive Committee.

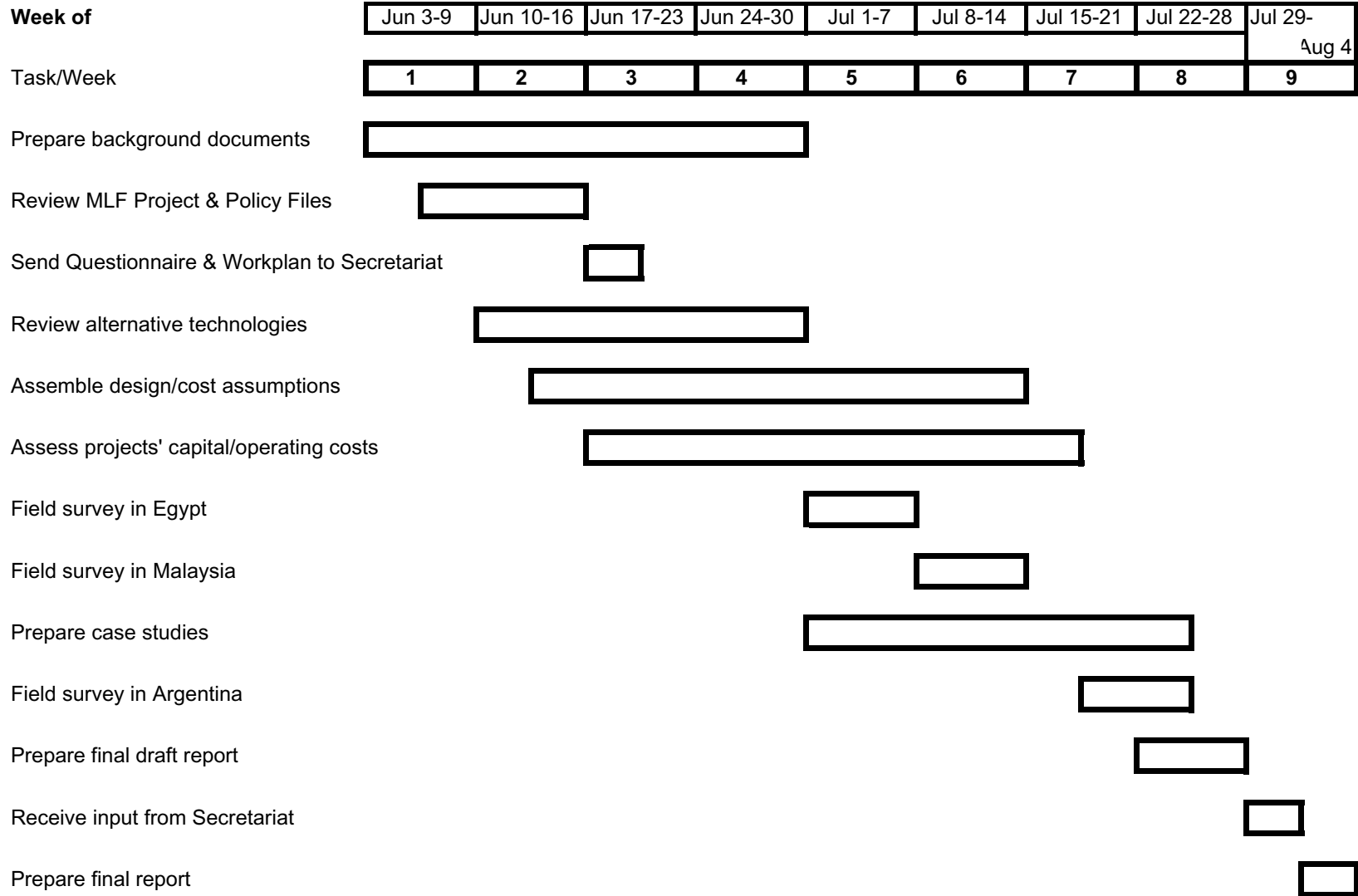
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**Alternatives to CFCs  
in Rigid Foam Applications**

workplan.xls

**STUDY ON ALTERNATIVES TO CFCs IN RIGID FOAM APPLICATIONS**

**Work Plan**



# Alternatives to CFCs in Rigid Foam Applications

**1. Background Information**

Date: \_\_\_\_\_

Company \_\_\_\_\_

Ownership \_\_\_\_\_

Name and Title of respondent \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_

Country \_\_\_\_\_ Project No. \_\_\_\_\_

Telephone numbers:      Voice: \_\_\_\_\_      Fax: \_\_\_\_\_

eMail Address \_\_\_\_\_

National Coordinating Agency \_\_\_\_\_ Implementing Agency \_\_\_\_\_

**2. Production Facility**

	<b>Boardstock</b>	<b>Spray</b>	<b>Appliances</b>	<b>Laminated Panels</b>	<b>Boardstock</b>	
Rigid Foam Type						

**3. Events Leading to Replacement of Ozone Depleting Substances at Your Plant**

<b>Year</b>	1993	1994	1995	1996	1997	1998	1999
<b>Application date</b>							
<b>Approval Date</b>							
<b>Conversion Date</b>							

**4. Alternative Technologies Available for Replacing Ozone Depleting Substances at Your Plant**

Blowing Agent	Available to You	Selected Interim	Selected Final
Hydrocarbon Mixtures			
Cyclopentane			
n-Pentane/iso-Pentane			
Water			
CO2			
HCFC-22			
HCFC-141b			
HFC-134a			
HCFC Mixtures			
HFC Mixtures			
Others			

**5. List the Factors that Influenced Your Selection in Question 4 in order of Decreasing Importance**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Alternatives to CFCs  
in Rigid Foam Applications**

6. Were You Aware that HCFC's Will be Phased Out When You Made Your Selection of an Alternative?

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7. Were You Aware that Low Pressure Foam Dispensers Could be Retrofitted for Use With HCFC-141b?

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8. List the Organizations that Assisted You in Making Your Selection in Question 4

National Coordinating Agencies	<hr/>
Implementing Agencies	<hr/>
Equipment Suppliers	<hr/>
Chemical Suppliers	<hr/>
Consulting Firms	<hr/>
Others	<hr/>

9. List the Multilateral Fund Policies that Influenced Your Selection in Question 4

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10. If You Listed any Multilateral Fund Policies in Question 7, Describe How the Policies Influenced Your Selection in Question 4

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11. Incremental Capital Costs for Conversion to CFC Alternatives

	1,000 \$	1,000 \$	1,000 \$	1,000 \$		
<b>CONVERSION COST</b>						
Foam Dispensers						
Blending Equip.						
Storage Tanks						
Retrofit Costs						
Metering Systems						
Technology Transfer/Training						
Commissioning/Start-up Trials						
Other						
<b>TOTAL</b>	-					
Company Funds	-					

**Alternatives to CFCs  
in Rigid Foam Applications**

MLF Funds

-					
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**12. Incremental Operating Costs for Conversion to CFC Alternatives**

**Kilograms Raw Materials Consumed per Year**

	Conversion - 3 Year	C - 2 Year	C - 1 Year	Conversion Year	C + 1 Year	C + 2 Year	C + 3 Year
CFC-11							
HCFC 141b							
Cyclopentane							
n-Pentane							
Iso-Pentane							
CO2 Liquid							
Water							
Other							
A-Side							
MDI							
B-Side							
Polyol							
Other							
Total							

**Average Price of Raw Materials, \$/ Kg**

	Conversion - 3 Year	C - 2 Year	C - 1 Year	Conversion Year	C + 1 Year	C + 2 Year	C + 3 Year
CFC-11							
HCFC 141b							
Cyclopentane							
n-Pentane							
Iso-Pentane							
CO2 Liquid							
Water							
Other							
A-Side							
MDI							
B-Side							
Polyol							
Other							
Total							

## Alternatives to CFCs in Rigid Foam Applications

**12. Incremental Operating Costs for Conversion to CFC Alternatives, Cont'd**

**Annual Price of Raw Materials, \$**

	Conversion - 3 Year	C - 2 Year	C - 1 Year	Conversion Year	C + 1 Year	C + 2 Year	C + 3 Year
CFC-11							
HCFC 141b							
Cyclopentane							
n-Pentane							
Iso-Pentane							
CO2 Liquid							
Water							
Other							
A-Side							
MDI							
B-Side							
Polyol							
Other							
<b>Total</b>							

**13. Foam Characteristics Before and After Conversion to CFC Alternatives**

Foam Characteristic		CFC-11 Agent	Interim Agent	Final Agent
Density, Kg/M3				
R-Factor				
Other				

**14. Based on Your Experience, What is a Typical Operating Life for a Low Pressure Foam Dispenser?**

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**15. Based on Your Experience, What is a Typical Operating Life for a High Pressure Foam Dispenser?**

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