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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Fifty-eighth Meeting
Montreal, 6-10 July 2009

PROJECT PROPOSAL: BRAZIL

This document consists of the comments and recommendation of the Fund Secretariat on the following project proposal:

Foam

- Pilot project to validate methylal as blowing agent in the manufacture of polyurethane foams (phase I) — UNDP

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT
BRAZIL

PROJECT TITLE(S)	BILATERAL/IMPLEMENTING AGENCY
(a) Pilot project to validate methylal as a blowing agent in the manufacture of polyurethane foams (phase I)	UNDP

NATIONAL CO-ORDINATING AGENCY	Ministry of Environment, MMA/PROZON

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2007, AS OF MAY 2009)

HCFCs	1,545.2		

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2008, AS OF MAY 2009)

ODS			
HCFC -22	1,183.3	HCFC-123	0.4
HCFC-141b	621.5	HCFC-124	6.6
HCFC-142b	1.3	**Total**	**1,813.1**

CFC consumption remaining eligible for funding (ODP tonnes)	0.0

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US $ million	Phase-out ODP tonnes
	(a)	Based on decision 55/43 (e)	n/a

PROJECT TITLE:	
ODS use at enterprise (ODP tonnes):	
ODS to be phased out (ODP tonnes):	n/a
ODS to be phased in (ODP tonnes):	n/a
Project duration (months):	9
Initial amount requested (US $):	464,200
Final project costs (US $):	464,200
Incremental Capital Cost:	422,000
Contingency (10 %):	42,200
Incremental Operating Cost:	
Total Project Cost:	464,200
Local ownership (%):	100%
Export component (%):	0%
Requested grant (US $):	464,200
Cost-effectiveness (US $/kg):	n/a
Implementing agency support cost (US $):	34,815
Total cost of project to Multilateral Fund (US $):	499,015
Status of counterpart funding (Y/N):	n/a
Project monitoring milestones included (Y/N):	Y

SECRETARIAT'S RECOMMENDATION	For Individual Consideration

PROJECT DESCRIPTION

1. On behalf of the Government of Brazil, UNDP has submitted to the 58th Meeting of the Executive Committee a pilot project for validation of methylal as a blowing agent in the manufacturing of polyurethane foams (phase I) in Brazil. The total cost of phase I of the pilot project is US $464,200 plus agency support costs of US $34,815.

2. Methylal (dimethoxymethane) is a chemical of the acetyl group mainly used as a solvent and in the manufacturing of perfumes, resins, adhesives, paint strippers and protective coatings. The use of methylal as a co-blowing agent with hydrocarbons or HFCs for rigid foam applications has been described in the literature. However, there is no information on whether it has been used in any foam application. In the manufacturing of continuous panels, it is claimed that methylal improves the miscibility of pentane and the adhesion to metal surfaces, promotes blending in the mixing head, and foams uniformly, reducing the size of the cells. In discontinuous panels, where non-flammable agents are commonly used, addition of small amounts of methylal to HFCs allows for pre-blends with polyols of low flammability with no detrimental effect on the fire performance of the foam. Methylal reduces the cost, and improves miscibility, foam uniformity and adhesion to metal surfaces. Despite literature references, knowledge of methylal as blowing agent is limited.

3. The project, therefore, proposes to first develop, optimize and validate the use of methylal as a blowing agent in all relevant polyurethane foam applications (phase I), apply the technology (if it has been validated) in a limited number of downstream foam plants covering several different applications, and then transfer it to interested systems houses (phase II). The technology will be demonstrated in Arinos Quimica Ltda (Arinos), a large chemical distributor and polyurethane systems house founded in 1993 as Flexquim and renamed to Arinos in 1997 when the company relocated. Arinos has a customer base of some 250 polyurethane companies in the systems area.

4. Arinos has already developed the methylal technology for packaging foams; however, it has not been yet validated. During phase I of the project, the following applications will be developed, optimized and validated:

Foam type	Application	Critical properties
Integral skin	Steering wheels	Friability, surface
	Shoe soles	Surface
	Structural (rigid)	Surface
	Semi-flexible	Surface
Rigid insulation	Domestic refrigeration	Insulation, adhesion
	Commercial refrigeration	Insulation, adhesion
	Water heaters	Insulation, adhesion
	Trucks	Insulation, adhesion
	Panels-continuous	Insulation, adhesion
	Panels-discontinuous	Insulation, adhesion
	Spray	Insulation, adhesion
	Blocks	Insulation
	Thermoware	Insulation, adhesion
	Pipe-in-pipe	Insulation, adhesion
Semi-rigid	Packaging foam	Shock absorption
Flexible	Hyper-soft molded	Appearance, touch
	Hyper-soft slabstock	Appearance, touch
	Low resilience	Resilience curve

5. The total cost of phase I has been estimated at US $464,200 with the breakdown shown in the table below. The preliminary cost of phase II has been estimated at US $629,700 excluding, incremental operating costs.

Description	US $
Project preparation	30,000
Technology transfer and training	25,000
System development (17 applications at US $5,000 each)	85,000
Optimization (17 applications at US $3,000 each)	51,000
Validation (18 applications at US $2,000 each)	36,000
Laboratory equipment	150,000
Peer review/preparation of next phase	20,000
Technology dissemination workshops	25,000
Contingencies (10 per cent)	42,200
Total	**464,200**

6. The project will be implemented in 9 months.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

7. The Secretariat reviewed the project in light of the policy paper on the revised analysis of relevant cost considerations surrounding the financing of HCFC phase-out submitted to the 55th Meeting, and decision 55/43 adopted by the Executive Committee, as well as the pilot projects to validate methyl formate in integral skin foam applications in Brazil and Mexico, also submitted by UNDP to the 56th Meeting.

8. The HCFC cost paper considered by the Executive Committee at its 55th Meeting noted the importance of engaging selected systems houses in Article 5 countries to validate new or considerably revised technologies for use in HCFC-phase-out projects in a timely manner so that investment projects can benefit immediately from the validation exercise. Noting that the pilot project is similar to the one for the validation of methyl formate approved at the 56th Meeting, and also that the two systems houses selected for validating the technologies were located in Brazil, the Secretariat raised the following issues, which were addressed by UNDP as follows:

(a) The same laboratory equipment is required for validation of both chemicals. Therefore the equipment that was procured for the validation of methyl formate could also be used for the validation of methylal, saving some US $130,000 to the Multilateral Fund (assuming US $20,000 for transportation of the equipment between the two systems houses);

Although UNDP agreed that the suggestion was good, it was not feasible for it to be implemented. Establishing an independent site within a university, a foam association, or a Government laboratory for testing and optimizing alternative technologies would require entering into an agreement with the institution, training of its staff, and other logistical arrangements. This approach would take time and delay the implementation of the project considerably. If the products were to be tested at the systems house where methyl formate is being validated, getting samples from one location to another would be costly, would create a severe bottleneck and slow implementation of the project. The systems houses involved had agreed with UNDP that the equipment to be provided will only be used for the purposes of the project and not for any other commercial purpose outside the scope of the project.

(b) The Secretariat asked whether UNDP was proposing to validate the methylal technology by independent foam experts and/or the Foam Technical Options Committee (FTOC) of TEAP;

UNDP pointed out that it is currently in the process of drafting a validation protocol for methylal with the FTOC. The protocol will list all operational and property parameters and their baseline values. For each foam application, a validation test will be performed on the foam equipment that is part of the project, with authorized FTOC representatives (one or two) in attendance. The resulting non-HCFC material will be tested and the properties will be compared with the baseline values. It will be up to the FTOC to determine if any differences are within the tolerance margin or not. Once prepared (in about two months), UNDP will share the protocol with the Secretariat.

(c) Noting the potential benefit of replacing HCFC-141b with methylal (and/or methyl formate), UNDP was invited to consider means to allow for a wider distribution of the results of the two pilot projects in all Article 5 countries with HCFC-based foam manufacturing plants;

UNDP indicated that the outcome of the project will be shared with all interested parties through a dissemination workshop. The target audience will include system houses (from anywhere in the world), representatives from governments, the Fund Secretariat, bilateral and implementing agencies and TEAP members, as well as polyurethane manufacturers. Smaller HCFC foam users could be represented though their system suppliers, as this is the way they will use the technology. UNDP also considered interesting the suggestion by the Secretariat to develop comparative fact sheets of various alternative technologies, and will pursue said development.

(d) The feasibility of implementing the pilot project in a shorter period of time given the similarity with the project for the validation of methyl formate approved at the 56th Meeting;

UNDP reported that it takes about two months for it to receive the funds for the project after approval by the Committee. In the case of Purcom, the implementation of the project started with funds advanced by the company, which resulted in completing the development stage of almost half of the applications. UNDP will take this approach with Arinos.

9. It is indicated in the project proposal that Arinos entered into an agreement with Lambiotte (Belgium) for the exclusive distribution of methylal. Noting that this is a commercially available chemical product, the Secretariat sought additional information on the availability of methylal in Article 5 countries and its price. UNDP indicated that Arinos currently has exclusive representation for methylal from Lambiotte for Brazil only, but that there is an option to include all Latin-American countries. Lambiotte is the only methylal manufacturer that has developed work for the use of methylal in polyurethane foam applications, and Arinos is the first company in an Article 5 country that is considering this technology. There are other manufacturers of methylal (i.e., Caldic in Belgium; Kinbester and Sinochem in China; Spectrum and Alcem in the United States) and one additional importer/distributor in Brazil (Eco Tag Commercial Ltd.) but they are not in the business of polyurethane systems.

10. The Secretariat and UNDP also discussed cost-related issues, including the request for US $25,000 for technology dissemination workshops and for laboratory equipment (including two foam dispensers at a total cost of US $70,000). It was noted that the company is already in this line of business and, as it is a large systems house in Brazil, this equipment is part of the baseline. UNDP reported that the equipment requested for validation is not part of the company's baseline. It uses (frequently against payment) equipment from its customers. However, for the large development and validation effort associated with this pilot project, this will not be a feasible approach.

RECOMMENDATION

11. Noting that through its decision 55/43 (e), the Executive Committee invited bilateral and implementing agencies, as a matter of urgency, to prepare and submit a limited number of specific projects involving systems houses and/or chemical suppliers for the development, optimization and validation of chemical systems for use with non-HCFC blowing agents, and in light of the comments by the Secretariat, the Executive Committee may wish to consider approving the pilot project for validation of methylal as a blowing agent in the manufacturing of polyurethane foam (phase I) in Brazil at a cost of US $464,200 plus agency support costs of US $34,815 for UNDP.
