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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-first Meeting
Geneva, 5-7 July 2000

PROJECT PROPOSAL: URUGUAY

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

Foam

- Terminal program for the elimination of CFC-11 in the manufacture of polyurethane foam through the use of HCFC-141b technology in the foam sector in Uruguay by means of technical assistance and conversion to different companies World Bank

**PROJECT EVALUATION SHEET
URUGUAY**

SECTOR: Foam ODS use in sector (1999): 10 ODP tonnes

Sub-sector cost-effectiveness thresholds: Rigid US \$7.83/kg

Project Titles:

- (a) Terminal program for the elimination of CFC-11 in the manufacture of polyurethane foam through the use of HCFC-141b technology in the foam sector in Uruguay by means of technical assistance and conversion to different companies

Project Data	Rigid
	Terminal
Enterprise consumption (ODP tonnes)	4.78
Project impact (ODP tonnes)	4.35
Project duration (months)	18
Initial amount requested (US \$)	107,800
Final project cost (US \$):	
Incremental capital cost (a)	83,000
Contingency cost (b)	8,300
Incremental operating cost (c)	23,301
Total project cost (a+b+c)	114,601
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US \$)	91,300
Cost effectiveness (US \$/kg.)	N/A
Counterpart funding confirmed?	N/A
National coordinating agency	Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente
Implementing agency	IBRD

<i>Secretariat's Recommendations</i>	
Amount recommended (US \$)	91,300
Project impact (ODP tonnes)	4.35
Cost effectiveness (US \$/kg)	N/A
Implementing agency support cost (US \$)	11,869
Total cost to Multilateral Fund (US \$)	103,169

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1999)	166.38 ODP tonnes
- Baseline consumption of Annex A Group I substances (CFCs)	199.10 ODP tonnes
- Consumption of Annex A Group I substances for the year 1999	111.36 ODP tonnes
- Baseline consumption of CFCs in foam sector	63.80 ODP tonnes
- Consumption of CFCs in foam sector in 1999	9.99 ODP tonnes
- Funds approved for investment projects in foam sector as of end of 1999	US \$1,100,050.00
- Quantity of CFC to be phased out in investment projects in foam sector as of end of 1999	91.00 ODP tonnes
- Quantity of CFC phased out in investment projects in foam sector as of end of 1999	84.60 ODP tonnes
- Quantity of CFC to be phased out in investment projects in foam sector approved in 1999	0.00 ODP tonnes
- Funds approved for investment projects in the foam sector in 1999	US \$0.00

Multiple Sub-Sector

Terminal Umbrella Project

1. This is a terminal project for four remaining low volume CFC consuming foam producing companies in Uruguay, namely Bromyros, Ferroco, Foumaya and Topsy. The total CFC-11 consumption of the enterprises is 4.78 ODP tonnes, which is 48.3% of Uruguay's 1999 consumption of ODS in the foam sector. The companies produce rigid and integral skin polyurethane foams for various applications indicated in Table 1.

2. The foam producing industry in Uruguay is characterized by operations of manufacturers consuming low levels of CFC. The largest and only rigid foam project approved for the country in May 1999 had CFC-11 consumption of 10.2 ODP tonnes.

3. The total project cost is made up of the capital cost of US \$91,300 including 10% contingency. The total incremental operating cost is US \$23,301, but this is not requested in line with Decision 25/50.

4. The project costs include retrofit of the three existing high pressure dispensers for US \$36,000 for conversion of rigid foam production to HCFC-141b and one low pressure machine and mold heating at US \$25,000 for conversion of integral skin foam production to water-blown. The cost of supervision and trials and other related technical assistance costs amount to US \$22,000.

Table 1: Profile of the Companies in Uruguay Terminal Umbrella Foam Project.

Enterprise	Date Founded	CFC-11 Consumption Tonnes	Product Manufactured	Proposed Grant* US \$
Broanyros	Not available	0.28	Refrigeration chambers	12,000
Ferroco	1965	3.60	Insulated containers	12,000
Fumaya	Not available	0.55	Semi-rigid foams and integral skin molding for office furniture	25,000
Topsy	1982	0.35	Commercial refrigeration for ice cream industry	12,000

*Technical assistance for the implementation of the project (applied to all the four projects):
Technician for supervision and trials: US \$20,000.

The total project cost including 10% contingency is US \$91,300. The total incremental operating cost of the project amounts to US \$23,301. The incremental operating cost is not requested.

Justification for the use of HCFC-141b

5. Three of the companies will use HCFC-141b as substitute blowing agent. The World Bank has provided the justification for this use together with the letter of the Government supporting this option. These are attached as annexes to this evaluation.

Impact of the projects

6. 3.5 tonnes will be phased out when the project is implemented. This will eliminate 44% of Uruguay's CFC consumption in the foam sector. (The bulk of its CFC consumption is in the refrigeration servicing sector).

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Fund Secretariat and the World Bank discussed the project. The Secretariat was informed that in line with Decision 25/50 considerable part of the implementation of the project will be undertaken by systems providers with a local technician to supervise the implementation and other follow-up activities. The World Bank will, however, maintain its oversight responsibility. The Bank further indicated that it was realized during project preparation that costs of inputs from external sources tended to be high which makes items such as retrofit costs or costs of chemicals higher than usual.

2. No incremental operating costs are claimed. Cost-effectiveness threshold is not applicable to this project in accordance with Decision 25/50 and also on account of Uruguay being a low volume consuming country (LVC). However the composite cost-effectiveness of the projects was calculated to be US \$20.99/kg

RECOMMENDATIONS

3. The Fund Secretariat recommends blanket approval of the terminal umbrella project with the level of funding and associated support cost indicated below.

4. The approval of the terminal project is on condition that no further projects in the foam sector will be submitted for funding under the Multilateral Fund by the Government of Uruguay.

	Project Title	Project Funding (US\$)	Support Cost (US\$)	Implementing Agency
(a)	Terminal program for the elimination of CFC-11 in the manufacture of polyurethane foam through the use of HCFC-141b technology in the foam sector in Uruguay by means of technical assistance and conversion to different companies	91,300	11,869	IBRD

ANNEX I

Justification of Selection of Alternative Technology

Currently, there are different technically feasible replacement technologies for CFC-11 as blowing agent in the production of rigid polyurethane foams for construction and insulating purposes: (a) HCFC-141b, (b) HCFC 22, (c) HFC-134a, and (d) cyclopentane.

The first technology is comparable to the CFC-11/water system used currently, but it is a transitional solution due to the presence of HCFC-141b. Due to its ozone depleting potential (ODP) of 0.1, this option needs to be replaced in the future. About a 10% increase in density is normally required to compensate for the lower dimensional stability of the foam. This solution can technically be implemented in the shortest time and the best chance of success in the enterprise because it is closest to the current technology. Commonly associated investments in HP foaming equipment are made to ensure excellent foam quality, compensating for the decreased solubility of the HCFC-141b vs. CFC-11 and loss in thermal insulation quality.

The second system, also a transitional solution with a lower ODP (0.05) uses a foaming gas. It requires a HP foaming equipment that includes an in-line pre-mixing device (already available in the market); or a conventional HP dispensing machine plus a pre-blending unit. Its advantage resides in that the same equipment may operate with other gaseous solutions such as HFC-134a. As with HCFC-141b, this technology requires about a 10% increase in density to compensate for the gains in thermal conductivity. This technology is not available in Uruguay.

The third system is similar to the HCFC-22 option, although it does not have ODP, and can be considered as a definitive technology. Notwithstanding, the high price of HFC-134a vs. HCFC-141b or HCFC-22 does not make this technology economically feasible for the moment being. Also, requiring more water than the other alternatives, it may present potential dimensional problems if not handled properly. This technology is not available in Uruguay.

The fourth solution is cyclopentane, a technology that has successfully been introduced in various European Countries. The use of pentane in this case would be prohibitive from the safety cost standpoint, both at the foaming head and the heated molds. Besides, the production facility is located in an area within the city where it is not permitted to use this substance.

The interim HCFC-141b solution seems to be the simplest option at a relatively moderate investment cost. It is commercially available in Uruguay. For these reasons, this group of companies will use HCFC-141b as an intermediate option and will study the use of a final solution.

The final solutions will need some time to implement, and the final decision would be taken according to the ultimate trends in the Uruguayan market. The four companies are aware that it will bear the costs of these final solutions.

Montevideo, 04 NOV. 1999

Dr. Omar El Arini
Director del Fondo Multilateral del
Protocolo de Montreal

Of. 605/99

De mi mayor consideración:

Ref: Tecnología seleccionada en el Proyecto Terminal para la
eliminación de CFC-11 en la manufactura de espumas de
poliuretano mediante el uso de HCFC-141b.

Me complace confirmarle que es voluntad ministerial sustituir el consumo nacional de las sustancias agotadoras del ozono en general y en particular del CFC-11 para dar efectivo cumplimiento a las obligaciones de Uruguay emergentes del Protocolo de Montreal.

Dentro de este marco, el proyecto de referencia es una componente importante de nuestro Plan Nacional para la Eliminación Gradual del Uso de las Sustancias Agotadoras del Ozono, el cual ha dado como resultado relativo al año base, una reducción de 45% del consumo de las sustancias controladas en los Anexos A y B del citado Protocolo.

Con respecto a la tecnología oportunamente seleccionada, quisiera señalar que el Banco Mundial ha brindado información sobre todas las tecnologías disponibles, por lo cual estoy en conocimiento sobre que el HCFC-141b es una sustancia cuyo uso deberemos eliminar en el futuro.

No obstante lo expresado anteriormente, luego de haber realizado cuidadosas consideraciones de todos los factores tecnológicos y económicos involucrados en el presente proyecto de reconversión, brindo mi aval a la selección técnica realizada.

Finalmente, deseo agradecerle la consideración de esta solicitud de asistencia para las actividades de protección a la capa de ozono en mi país.

Sin otro asunto particular le saludo muy atentamente,

Gra. Beatriz Martínez Arcoz
MINISTRA DE VIVIENDA
ORDENAMIENTO TERRITORIAL
Y MEDIO AMBIENTE