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PROJECT PROPOSALS: ECUADOR

This document consists of the comments and recommendations of the Fund Secretariat on the following projects:

Foam

- Elimination of CFC-11 in the fabrication of flexible foams by replacement with methylene chloride at an automobile and furniture component manufacturing plant belonging to Elasto S.A. World Bank

Refrigeration

- Replacing CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Indurama S.A. World Bank
- Replacement of CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Ecuatoriana de Artefactos S.A. (ECASA) World Bank

Fumigant

- Demonstration project for testing methyl bromide alternatives in soil treatment for the flower growing industry World Bank

SECTOR:	FOAM	ODS use in sector (1990):	96 ODP tonnes
Sub-sector cost-effectiveness thresholds:	Integral Skin		US \$16.86/kg

Elimination of CFC-11 in the fabrication of flexible foams by replacement with methylene chloride at an automobile and furniture component manufacturing plant belonging to Elasto S.A.

Project Data	Integral Skin
	Elasto S.A.
ODS phase-out (ODP tonnes)	32
Proposed project duration (months)	18
Incremental capital cost (US \$)	256,173
- including contingency (%)	9.8
Incremental operational cost (US \$)	(35,502)
Total project cost (US \$)	220,671
Local ownership (%)	100
Export component (%)	0
Amount requested (US \$) {Original}	198,718
{Revised}	
Cost effectiveness (US \$/kg)	6.23
National Coordinating Agency	The Environmental Unit of the Ministry of Commerce, Industrialization and Fisheries
Implementing Agency	World Bank
Technical review completed?	Yes

Secretariat's Recommendations:	
Amount recommended (US \$)	187,286
Project impact (ODP tonnes)	32
Cost effectiveness (US \$/kg)	5.85
Implementing Agency support cost (US \$)	24,347
Total cost to Multilateral Fund (US \$)	211,633

PROJECT DESCRIPTION

Elimination of cfc-11 in the fabrication of flexible foams by replacement with methylene chloride at an automobile and furniture component manufacturing plant belonging to Elasto s.a.

1. It is reported that in 1990, the base year of Ecuador's Country Programme, consumption of CFC-11 and CFC-12 was 96 tonnes and 548 tonnes respectively. The consumption of both CFC-12 and CFC-11 by the foam blowing sector in that year accounted for 9% of the total amount consumed. The consumption of CFC-11 in 1997 was 54.8 tonnes. CFC-11 is used specifically by the flexible foam sub-sector to produce parts for furniture, automobile seats and interiors, mattresses, as well as carpet padding. CFC-11 use in the foam blowing sector in Ecuador has declined somewhat but has not kept pace with the general drop in CFC-12 use. A number of foreign owned foam producing companies have transitioned away from CFC-11, but many Ecuadorian owned enterprises continue to use the substance.
2. The mattress manufacturing sub-sector is already using methylene chloride to produce foams with a density of 11 kg/m³ or less.
3. Elasto is a 100% Ecuadorian company established in 1987 with installed capacity of 480 tonnes of foam per year. Elasto manufactures flexible foams for automobile parts and seats, as well as furniture components at its plant in Quito. The company produced about 287 tonnes of foam in 1997 using 32 tonnes of CFC-11.
4. It currently operates a 1978 Admiral low pressure machine and a 1988 Elastogran Puromat F50 machine. The company currently employs a molding process to produce flexible foam products.
5. The phaseout of CFC-11 is to be achieved through conversion to the use of methylene chloride. One high pressure RIM-Star machine and associated equipment is being requested at the cost of about US \$215,000. Trials, technology transfer and training amount to US \$15,000. There are incremental operational savings of US \$10,714.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The project's concepts and its costs were discussed between the Secretariat and the World Bank. It was agreed that since the company produces flexible molded rather than slabstock foam, the project's cost-effectiveness threshold should be US \$16.86/kg instead of US \$6.23/kg. It was also agreed that the high-pressure machine requested is not essential and hence the cost is not incremental. It was agreed to recalculate the project costs as follows:

INCREMENTAL CAPITAL COST:	US \$
Retrofit of two low pressure foaming machines:	40,000
Water cooling system:	5,000
Trial and testing, two foaming machines:	20,000
Ventilation and exhaust for two work areas and storage areas:	90,000
Technology transfer and training:	25,000
Total	180,000
10% contingency	18,000
	198,000
Incremental operational savings:	10,714
Total Project Cost (198,000 – 10,714)	187,286

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the project with the level of funding and associated support cost as indicated in the table below:

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
Elimination of CFC-11 in the fabrication of flexible foams by replacement with methylene chloride at an automobile and furniture component manufacturing plant belonging to Elasto S.A.	187,286	24,347	World Bank

PROJECT EVALUATION SHEET ECUADOR

SECTOR: FUMIGANT ODS use in sector (1997): 64 ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A

Project Title:

Demonstration project for testing methyl bromide alternatives in soil treatment for the flower growing industry

Project Data	Methyl Bromide
	Instituto Nacional de Investigaciones Agropecuarias
ODS phase-out (ODP tonnes)	-
Proposed project duration (months)	28
Incremental capital cost (US \$)	483,120
- including contingency (%)	10
Incremental operational cost (US \$)	N/A
Total project cost (US \$)	483,120
Local ownership (%)	100
Export component (%)	-
Amount requested (US \$) {Original}	483,120
{Revised}	244,244
Cost effectiveness (US \$/kg)	-
National Coordinating Agency	Ministerio de Comercio Exterior, Industrializacion y Pesca, Instituto Nacional de Investigaciones Agropecuarias
Implementing Agency	World Bank
Technical review completed?	N/A

Secretariat's Recommendations:	
Amount recommended (US \$)	244,244
Project impact (ODP tonnes)	N/A
Cost effectiveness (US \$/kg)	N/A
Implementing Agency support cost (US \$)	31,752
Total cost to Multilateral Fund (US \$)	275,996

PROJECT DESCRIPTION

Demonstration project for testing methyl bromide alternatives in soil treatment for the flower growing industry.

1. Methyl bromide consumption increased from 70 metric tonnes in 1992 to 107 tonnes in 1997 for soil fumigation in flower-growing greenhouses. It is projected that the use of methyl bromide will continue to increase as the flower industry continues to expand in Ecuador. Growers use methyl bromide to control pests prior to planting cut flowers.
2. The project is to demonstrate the application of alternatives to methyl bromide to control pests in flowers (roses and carnations) grown in greenhouses in four production areas: Imbabura, Pichincha, Cotopaxi and Azuay.
3. The alternatives to be tested and evaluated include a combination of solarization, steam pasteurization, substrate modifications, alternative agro-chemicals in low doses and an integrated pest management system (IPM).
4. Each of the five alternative technologies to be tested will include a minimum of three field tests in each of the four production areas for a total of 60 tests. All the tests will be conducted in conditions similar to those currently used by flower growers.
5. In order to ensure that the project is well understood to the interested parties (growers, importers, researchers) an initial workshop will be conducted. The specific roles of the participants during project implementation will be further discussed.
6. The expected results from project implementation are: (i) a technical and economic analysis of utilization of proposed alternatives to methyl bromide, (ii) training of at least five agronomists and/or crop specialists fully trained in the alternative technologies used and (iii) dissemination of the results of the demonstration project.
7. The project will be coordinated by the “Instituto Nacional Autónomo de Investigaciones Agropecuarias” (INIAP) with the participation of the “Servicio Ecuatoriano de Sanidad Agropecuaria” (SESA) of the Ministry of Agriculture and Livestock. INIAP will participate in activities related to technical research by providing access to laboratories, technical personnel, test greenhouses and fields, and office facilities. SESA will participate in activities related to technology transfer, dissemination of information, training, and technical assistance.
8. Through the Association of Flower Exporters (Expoflores), private growers will participate in the evaluation of proposed alternatives to methyl bromide and assist in dissemination of results.
9. The expected results of the project include identification of feasible alternatives to methyl bromide that will constitute a basis for designing and implementing a methyl bromide phase out strategy for Ecuador; dissemination of results among flower growers; reduction of health risk to flower growers; and promotion of actual methyl bromide phase out.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The project concept follows the Executive Committee's guidelines.
2. The Government of Ecuador ratified the Copenhagen Amendment on 24 November 1993.
3. The Secretariat and the World Bank discussed the request for contracting technical experts and support staff for a 24-month period, like project duration (US \$134,800). Also, the Secretariat requested the World Bank if they had made any attempt to implement Decision 24/18 (to contact Article 2 countries with a view to recruiting government experts from those countries during project implementation). In this regard, the World Bank agreed to adjust costs associated with personnel accordingly.
4. The Secretariat also sought clarification on the request for field tests (US \$80,000), non-investment type of activities, including information dissemination and workshops (US \$25,000), and a transport vehicle. The World Bank confirmed that the Government of Ecuador had agreed on cost adjustments to these items.

RECOMMENDATION

1. Taking into consideration the above comments, the Fund Secretariat recommends blanket approval of the project with associated support costs at the funding level shown in the table below:

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
Demonstration project for testing methyl bromide alternatives in soil treatment for the flower growing industry	244,244	31,752	World Bank

PROJECT EVALUATION SHEET ECUADOR

SECTOR: REFRIGERATION ODS use in sector (1997): ODP tonnes

Sub-sector cost-effectiveness thresholds: Domestic US \$13.76/kg

Project Titles:

- (a) Replacement of CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Ecuatoriana de Artefactos S.A. (ECASA)
- (b) Replacing CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Indurama S.A.

Project Data	Domestic	
	ECASA	Indurama
ODS phase-out (ODP tonnes)	15.73	28.38
Proposed project duration (months)	14	30
Incremental capital cost (US \$)	351,511	253,359
- including contingency (%)	10	10
Incremental operational cost (US \$)	139,620	103,000
Total project cost (US \$)	491,131	356,359
Local ownership (%)	100	100
Export component (%)	0	0
Amount requested (US \$) {Original}	217,821	242,547
{Revised}		
Cost effectiveness (US \$/kg)	13.76	8.54
National Coordinating Agency	MCIF	
Implementing Agency	World Bank	
Technical review completed?	Yes	

Secretariat's Recommendations:		
Amount recommended (US \$)	188,545	174,792
Project impact (ODP tonnes)	15.73	28.38
Cost effectiveness (US \$/kg)	13.76	10.22
Implementing Agency support cost (US \$)	24,510	22,722
Total cost to Multilateral Fund (US \$)	213,055	197,514

PROJECT DESCRIPTION

- (a) **Replacement of CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Ecuatoriana De Artifacts, S.A. ECASA, Quito, Ecuador**
- (b) **Replacing CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Indurama, S.A., Cuenca, Ecuador**

Background for domestic refrigeration sub-sector in Ecuador

1. The total consumption of CFC-12 in Ecuador in 1997 was 239.7 MT, of which about 70 MT were consumed by the refrigeration sector. Total production of the domestic refrigerator section reached 131,143 units in 1997. Overall, the consumption of CFC-12 in the refrigeration sector in Ecuador has dropped significantly due to conversions to HCFC-22 and R-502 alternatives in the commercial refrigeration sub-sector.

2. Three projects, including Indurama and ECASA, were approved at the 9th Meeting of the Executive Committee to convert the use of CFC-11 to 50% CFC-11 reduced technology for foam blowing operations. According to the draft of the completion report received from the World Bank, the three enterprises eventually converted to HCFC-141b technology.

3. It is stated in the proposals for Indurama and ECASA that the phaseout of 44.11 MT of CFC-12 represents a remarkable reduction in achieving the country's 1999 freeze, and that the Country Programme foresees the total elimination of ODS by the year 2000.

- (a) **Replacement of CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Ecuatoriana De Artifacts, S.A. ECASA, Quito, Ecuador**

4. ECASA was established in 1962. Since then, the company has embarked on the replacement of CFC technology by their own initiative, replacing CFC-12 technology with HFC-134a technology, resulting in a change of production equipment and refrigerator design. The enterprise has already purchased most of the required equipment. Funds are requested retroactively.

5. Total production was 69,810 refrigerators in 1997, representing a 43% market share. ECASA exports 10% of its product to Peru, Bolivia, and Chile.

6. Implementation of this project results in the phaseout of 13.23 ODP tons of CFC-12. The CFC-12 refrigerant will be replaced by HFC-134a.

7. The transition to HFC-134a involved the acquisition of 28 vacuum pump conversion kits, 19 new pumps, 8 vacuum gauges, 16 manifold charging hoses, two charging boards, 2 retrofit kits for charging equipment. Twenty-one leak detectors, recovery and recycling equipment, equipment storage and various laboratory equipment. Fifteen customer service shops were also outfitted with pumps and leak detectors.

8. Incremental operating cost of \$139,620 is requested for six months, to cover the cost of refrigerant, compressors, filter/dryer, and capillary tubes.

9. The list of baseline equipment to be destroyed is provided in the proposal. A disposal plan will be presented for approval to the Environment Unit, which will verify and certify its adequate execution. A copy will be sent to the World Bank.

(b) Replacing CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Indurama, S.A., Cuenca, Ecuador

10. Indurama, S.A. was established in 1972, and began domestic refrigerator production in 1980. The present total production is 73,763 units/year. The market is local, with 10% exported to Peru, Bolivia, and Chile.

11. This project represents the reduction of 28.28 MT of CFC-12 used in the manufacture of domestic refrigerators at Indurama, S.A. The CFC-12 refrigerant will be replaced by the HFC-134a, resulting in the replacement of production equipment and a change in refrigerator design. The enterprise has already purchased the required equipment and is proceeding with implementation of the training programme. Funds are requested retroactively.

12. Two new automatic charging stations are purchased by the company, and the existing one will be retrofitted, seventeen vacuum pumps will be retrofitted. Two new HFC-134a leak detectors will replace three CFC-12 leak detectors. The use of HFC-134a will require a pilot scale production trial and reliability test.

13. The incremental operating cost is requested for six months, to cover the cost of refrigerant, compressors, filter/dryer, and capillary tubes.

14. It is stated that the company will render unusable all ODS-using equipment replaced because of the project implementation. A disposal plan will be presented for approval to the Environment Unit, which will verify and certify its adequate execution. A copy will be sent to the World Bank.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat discussed with the World Bank the eligibility of costs requested in the two proposals.

(a) Replacing CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Indurama S.A.

2. The cost of two new charging boards was recognized as ineligible for funding. The requested cost of two leak detectors was reduced to reflect the price of leak detectors available in the markets.

- (b) Replacement of CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Ecuatoriana de Artefactos S.A. (ECASA)
3. Several items requested in the proposal (new vacuum pumps, gauges, additional leak detectors, including those requested for servicing operations, HFC-134a recovery and recycling equipment, storage tank, laboratory equipment) were not recognized as eligible.
4. Contingency costs requested in Indurama and ECASA under capital cost were not recognized as eligible for funding since the equipment has already been purchased and installed.
5. The level of eligible grants for Indurama and ECASA were calculated based on overall cost-effectiveness of conversion of the refrigeration and foam parts considering funds approved for Indurama and ECASA at the 9th Executive Committee Meeting.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the two projects with the funding level and associated support costs as indicated below.

Project Title	Project Cost US \$	Support Cost US \$	Implementing Agency
Replacement of CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Ecuatoriana de Artefactos S.A. (ECASA)	188,545	24,510	World Bank
Replacing CFC-12 refrigerant with HFC-134a at a manufacturing plant of domestic refrigerators belonging to Indurama S.A.	174,792	22,722	World Bank