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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 PROPOSALS: VENEZUELA

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

Foam

•	Phasing out CFC-11 with HCFC-141b at Friobox in the production of rigid P.U. panels	UNIDO
•	Phasing out CFC-11 with HCFC-141b at Nevecor in the production of rigid P.U. panels	UNIDO

PROJECT EVALUATION SHEET
VENEZUELA

SECTOR: Foam ODS use in sector (1999): 256.06 ODP tonnes

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

Project Titles:

(a) Phasing out CFC-11 with HCFC-141b at Friobox in the production of rigid P.U. panels
(b) Phasing out CFC-11 with HCFC-141b at Nevecor in the production of rigid P.U. panels

Project Data	**Rigid**	**Rigid**
	Friobox	**Nevecor**
Enterprise consumption (ODP tonnes)	18.50	40.90
Project impact (ODP tonnes)	16.50	36.40
Project duration (months)	18	18
Initial amount requested (US $)	128,387	198,374
Final project cost (US $):		
Incremental capital cost (a)	64,000	86,000
Contingency cost (b)	4,900	105,274
Incremental operating cost (c)	59,487	7,100
Total project cost (a+b+c)	128,387	198,374
Local ownership (%)	100%	100%
Export component (%)	0%	0%
Amount requested (US $)	128,387	198,374
Cost effectiveness (US $/kg.)	7.81	5.45
Counterpart funding confirmed?		
National coordinating agency	Fondoin	Fondoin
Implementing agency	UNIDO	UNIDO

Secretariat's Recommendations		
Amount recommended (US $)	128,387	198,374
Project impact (ODP tonnes)	16.50	36.40
Cost effectiveness (US $/kg)	7.81	5.45
Implementing agency support cost (US $)	16,690	25,789
Total cost to Multilateral Fund (US $)	145,077	224,163

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1999)*	2,385.59 ODP tonnes
- Baseline consumption of Annex A Group I substances (CFCs)	3,321.00 ODP tonnes
- Consumption of Annex A Group I substances for the year 1999	2,207.57 ODP tonnes
- Baseline consumption of CFCs in foam sector	615.30 ODP tonnes
- Consumption of CFCs in foam sector in 1999	242.04 ODP tonnes
- Funds approved for investment projects in foam sector as of end of 1999	US $2,785,703.00
- Quantity of CFC to be phased out in investment projects in foam sector as of end of 1999	455.18 ODP tonnes
- Quantity of CFC phased out in investment projects in foam sector as of end of 1999	332.60 ODP tonnes
- Quantity of CFC to be phased out in investment projects in foam sector approved in 1999	99.70 ODP tonnes
- Funds approved for investment projects in the foam sector in 1999	US $771,670.00

* As reported to the Fund Secretariat in April 2000.

Rigid Foam

1. Two companies (Friobox, Nevecor) produce rigid polyurethane insulation foam panels using two low-pressure machines each, 120 kg/min and 200 kg/min Vickitalia installed in 1983 and 1990 respectively at Friobox and 60 kg/min Decker DB30 and 80 kg/min Decker DB40 installed in 1985 and 1990 respectively. Under the current projects, the production is to be converted to HCFC-141b technology. The cost of these conversions includes the retrofitting of existing machines. At Friobox, this amounts to US $49,000, whereas at Nevecor the cost is US $71,000. These costs include commissioning and trials. The incremental operating cost for two years will be US $59,487 at Friobox, and US $105,274 at Nevecor.

Justification for the use of HCFC-141b

2. UNIDO indicated that the companies were briefed in detail about the environmental, technical and economic impacts of the choice of HCFC-141b as a substitute substance. The enterprises however, selected the HCFC-141b technology as an interim solution pending availability of zero ODP technologies.

3. UNIDO also submitted, in line with Decision 27/13 a letter from the Government of Venezuela, supporting the companies' choice of technology. The justification from UNIDO and the letter from the Government are attached as annexes to this document.

Impact of the projects

4. The 52.9 ODP tonnes CFC to be phased out from the two projects is 1.6% of Venezuela's baseline consumption of Annex A Group I substances and 22% of its 1999 consumption.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Fund Secretariat and UNIDO discussed the presentation of information regarding the projects' implementation and monitoring milestones, following which UNIDO has revised this information consistent with the current format. The costs of the projects have been agreed.

RECOMMENDATIONS

2. The Fund Secretariat recommends blanket approval of the Friobox and Nevecor projects with the level of funding and associated support costs as indicated in the table below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	Phasing out CFC-11 with HCFC-141b at Friobox in the production of rigid P.U. panels	128,387	16,690	UNIDO
(b)	Phasing out CFC-11 with HCFC-141b at Nevecor in the production of rigid P.U. panels	198,374	25,789	UNIDO

ANNEX I

ADDITIONAL JUSTIFICATION FOR USING HCFC TECHNOLOGY AT FRIOBOX, VENEZUELA

The UNIDO technical expert appraised the enterprises in this project prior the preparation of this project document in March 2000, and had discussions with the company's representatives about the choice of technology for replacing CFC-based technology. The enterprise was briefed in detail about the following:

a) An overview of the available interim (low ODP) and permanent (zero ODP) replacement technologies.
b) The "techno-economic impact"of each technology on the products manufactured, and the process and practices employed.
c) Possible implications of each technology, in terms of its known impact on environment, health and safety, such as ozone depleting potential, global warming potential, occupational health, etc.
d) It was emphasized to the company that HCFC technologies are interim technologies due to their residual ODP and therefore may continue to adversely affect the environment, although at a lower rate than CFC's.
e) It was further explained that HCFCs may become controlled substances under present or future international conventions and will therefore also need to be phased out at a future date, and any investment required for their phase-out and for conversion to a permanent technology will have to be borne by the enterprise itself.

The main conclusions reached by the enterprise through discussions with the UNIDO technical expert were:

1. The use of HCFC-141b is the only currently feasible option for the rigid P.U. foam production.
2. Water blown technology at this point results in a product that could not be sold commercially, its density increases by 20-30% with a reduction in insulation value of 35-40%.
3. The companies are not prepared, as per today, to operate with inflammable and explosive materials. Their industrial safety, alarm monitoring and training system has been established in accordance with the relevant requirements of the existing production programme.
4. Many types of mechanical works, including welding are carried out in the production building, restricting application of flammable blowing chemicals.
5. Hydrocarbons are too expensive to be implemented for the small scale production of foams.

In view of the above, among the solutions mentioned, HCFC-141b based systems in the interim technology selected until new developments (water or HFC-based systems) or new relocation of the factories allows the use of zero ODP technologies.

PROJECTED TECHNO-ECONOMIC IMPACT OF ZERO-ODP TECHNOLOGIES

FRIOBOX, VENEZUELA

The projected impact of applying various zero-ODP technologies with respect to the selected technology (HCFC-141b) in this project is summarized below:

The only currently available zero-ODP technology is **water-based** systems. Water based systems are however, more expensive than other CFC-free technologies due to reductions in insulation value (requiring larger thickness) and lower cell stability (requiring higher thickness). Water based systems can be applied where insulation performance is relatively less critical, but in case of the enterprises in this project, which manufacture foam for thermal insulation application, thermal conductivity is crucial.

Presently, suitable water-based formulations are not technically mature or economical. If such formulations become available in the future, it is expected that there would still be some drawbacks related to performance and costs. The net additional impact on project costs due to increased densities, with water based systems, is conservatively expected to be about US $175,000 with respect to HCFC-141b technology.

HFC-134a based systems are not offered in the applicable regional area and are not a feasible zero-ODP option.

Liquid HFC based systems do not meet requirements on maturity and availability at present time.

Thus, the selection of **HCFC-141b** based systems, as the preferred conversion technology, are justified taking into account all the technical, commercial and cost factors.

ADDITIONAL JUSTIFICATION FOR USING HCFC TECHNOLOGY AT NEVECOR, VENEZUELA

The UNIDO technical expert appraised the enterprises in this project prior the preparation of this project document in March 2000, and had discussions with the company's representatives about the choice of technology for replacing CFC-based technology. The enterprise was briefed in detail about the following:

a) An overview of the available interim (low ODP) and permanent (zero ODP) replacement technologies.
b) The "techno-economic impact"of each technology on the products manufactured, and the process and practices employed.
c) Possible implications of each technology, in terms of its known impact on environment, health and safety, such as ozone depleting potential, global warming potential, occupational health, etc.
d) It was emphasized to the company that HCFC technologies are interim technologies due to their residual ODP and therefore may continue to adversely affect the environment, although at a lower rate than CFC's.
e) It was further explained that HCFCs may become controlled substances under present or future international conventions and will therefore also need to be phased out at a future date, and any investment required for their phase-out and for conversion to a permanent technology will have to be borne by the enterprise itself.

The main conclusions reached by the enterprise through discussions with the UNIDO technical expert were:

1. The use of HCFC-141b is the only currently feasible option for the rigid P.U. foam production.
2. Water blown technology at this point results in a product that could not be sold commercially, its density increases by 20-30% with a reduction in insulation value of 35-40%.
3. The companies are not prepared, as per today, to operate with inflammable and explosive materials. Their industrial safety, alarm monitoring and training system has been established in accordance with the relevant requirements of the existing production programme.
4. Many types of mechanical works, including welding are carried out in the production building, restricting application of flammable blowing chemicals.
5. Hydrocarbons are too expensive to be implemented for the small scale production of foams.

In view of the above, among the solutions mentioned, HCFC-141b based systems in the interim technology selected until new developments (water or HFC-based systems) or new relocation of the factories allows the use of zero ODP technologies.

PROJECTED TECHNO-ECONOMIC IMPACT OF ZERO-ODP TECHNOLOGIES

NEVECOR, VENEZUELA

The projected impact of applying various zero-ODP technologies with respect to the selected technology (HCFC-141b) in this project is summarized below:

The only currently available zero-ODP technology is **water-based** systems. Water based systems are however, more expensive than other CFC-free technologies due to reductions in insulation value (requiring larger thickness) and lower cell stability (requiring higher thickness). Water based systems can be applied where insulation performance is relatively less critical, but in case of the enterprises in this project, which manufacture foam for thermal insulation application, thermal conductivity is crucial.

Presently, suitable water-based formulations are not technically mature or economical. If such formulations become available in the future, it is expected that there would still be some drawbacks related to performance and costs. The net additional impact on project costs due to increased densities, with water based systems, is conservatively expected to be about US $225,000 with respect to HCFC-141b technology.

HFC-134a based systems are not offered in the applicable regional area and are not a feasible zero-ODP option.

Liquid HFC based systems do not meet requirements on maturity and availability at present time.

Thus, the selection of **HCFC-141b** based systems, as the preferred conversion technology, are justified taking into account all the technical, commercial and cost factors.

FONDOIN

FONDO VENEZOLANO DE RECONVERSION INDUSTRIAL Y TECNOLOGICA

Caracas, March 7th, 2000

Messrs.
UNDIDO
Vienna

Attn.: **Mr. Enrique Puerto Ferre.**
Subject: **Commitment Letters of Projects involving HCFCs**

Dear Mr. Puerto Ferre,

In line with the decision 27/13 of the Executive Committee and in recognition of Article 2F of the Montreal Protocol, the Government of Venezuela:

a) Verifies that it had reviewed the specific situation at the enterprises (NEVECOR, FRIO BOX) as well as its HCFC commitments under the article 2F;

b) States that based on the prevailing circumstances at (NEVECOR, FRIO BOX) at the present time the conversion of these enterprises requires the use of HCFC-141b for the interim period as stipulated in the Montreal Protocol;

c) Confirms that the Government and the recipient enterprises understood that no funding would be available from the Fund for the future conversion from HCFCs for the said companies whenever such a conversion to other alternatives will be required.

Yours sincerely,

REPUBLICA BOLIVARIANA DE VENEZUELA FONDO VENEZOLANO DE RECONVERSION INDUSTRIAL Y TECNOLOGICA FONDOIN

Luis Hernández Muiño
President of FONDOIN

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