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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-fifth Meeting
Montreal, 5-7 December 2001

PROJECT PROPOSALS: NIGERIA

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

Foam:

• Phasing out of CFC-11 in the manufacture of flexible slabstock foam at Bamako Industrial Ltd. by conversion to methylene chloride	UNDP
• Conversion from CFC-11 to methylene chloride (MC) technology in the manufacture of flexible polyurethane at ten (10) box-foam enterprises in Lagos area (group project)	UNDP
• Phasing out of CFC-11 in the manufacture of rigid polyurethane foam at Agric Services (Nig.) Ltd. by conversion to a combination of water+HCFC-141b based systems	UNDP

Refrigeration:

• Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Polade	UNIDO
• Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of domestic and commercial refrigeration equipment at Ristian	UNIDO

PROJECT EVALUATION SHEET
NIGERIA

SECTOR: Foam ODS use in sector (2000): 3,125 ODP tonnes

Sub-sector cost-effectiveness thresholds: Flexible US $6.23/kg
Rigid US $7.83/kg

Project Titles:

(a) Phasing out of CFC-11 in the manufacture of flexible slabstock foam at Bamako Industrial Ltd. by conversion to methylene chloride
(b) Conversion from CFC-11 to methylene chloride (MC) technology in the manufacture of flexible polyurethane at ten (10) box-foam enterprises in Lagos area (group project)
(c) Phasing out of CFC-11 in the manufacture of rigid polyurethane foam at Agric Services (Nig.) Ltd. by conversion to a combination of water+HCFC-141b based systems

Project Data	**Flexible slabstock**	**Flexible slabstock**	**Rigid**
	Bamako	**Group project**	**Agric**
Enterprise consumption (ODP tonnes)	24.00	199.20	47.50
Project impact (ODP tonnes)	24.00	199.20	43.71
Project duration (months)	33	33	24
Initial amount requested (US $)	149,520	1,082,491	240,755
Final project cost (US $):			
Incremental capital cost (a)	110,000	1,064,200	73,000
Contingency cost (b)	11,000	106,420	7,300
Incremental operating cost (c)	-6,490	-18,761	158,860
Total project cost (a+b+c)	114,510	1,151,859	239,160
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
Amount requested (US $)	114,510	1,062,808	239,160
Cost effectiveness (US $/kg.)	4.77	5.33	5.47
Counterpart funding confirmed?	Yes	Yes	Yes
National coordinating agency	Federal Ministry of Environment		
Implementing agency	UNDP		

Secretariat's Recommendations			
Amount recommended (US $)	114,510	1,062,808	239,160
Project impact (ODP tonnes)	24.00	199.20	43.71
Cost effectiveness (US $/kg)	4.77	5.33	5.47
Implementing agency support cost (US $)	14,886	126,909	31,091
Total cost to Multilateral Fund (US $)	129,396	1,189,717	270,251

PROJECT DESCRIPTION

Sector background*

- Latest available total ODS consumption (2000)	4,810.95 ODP tonnes
- Baseline consumption of Annex A Group I substances (CFCs)	ODP tonnes
- Consumption of Annex A Group I substances for the year 2000	4,094.80 ODP tonnes
- Baseline consumption of CFCs in foam sector	3,650.00
- Consumption of CFCs in foam sector in 2000	3,125.00 ODP tonnes
- Funds approved for investment projects in foam sector as of end of July 2001	US $ 8,434,225.00
- Quantity of CFC to be phased out in investment projects in foam sector as of end of July 2001	1,547.10 ODP tonnes
- Quantity of CFC phased out from approved investment projects in the foam sector as of end of July 2001 (including CFC phased out in projects not yet reported as completed)	486.00 ODP tonnes
- Quantity of CFCs in approved ongoing investment projects in the foam sector as of end of July 2001	1,061.10 ODP tonnes
- Quantity of CFCs remaining to be phased out in the foam sector as of end of July 2001	2,063.90 ODP tonnes
- Quantity of CFCs to be phased out in investment projects being submitted to the 35th ExCom (December 2001).	270.70 ODP tonnes
- Quantity of CFCs remaining to be phased out in the foam sector by the end of 2001	1,793.2 ODP tonnes

* Analysis based on 2000 consumption data reported by the Government of Nigeria to the Fund Secretariat on 18 June 2001. Nigeria had not reported 2000 consumption data to the Ozone Secretariat as at 30 October 2001.

Flexible Slabstock Foam

1. One individual and one group flexible slabstock foam projects comprising 10 enterprises have been submitted to the 35th Meeting. These projects will phase out CFC-11 by conversion to methylene chloride.

Group project

2. The ten enterprises in the group project (Ayom, Biochemical, Bravo, Diana, Latunde, Sunny, St. Paul, SAC-MAC, Unique and Union) consumed a total of 199.2 ODP tonnes of CFC-11 per year (average 1998-2000) in the production of flexible slabstock foam for bedding and furniture applications. All the enterprises currently operate manual boxfoam machines.

3. The total incremental capital cost of the group project is US $1,303,868, including US $104,868 for technology transfer, trials and training. The incremental capital cost covers the cost of replacement of the manual boxfoam machines with semi-automatic boxfoam machines with 33% counterpart funding, methylene chloride storage facilities and metering pumps,

ventilation system, methylene chloride detectors and safety equipment. The calculation of incremental operational costs/savings results in a total incremental operational savings of US $18,761 for the ten enterprises. The project is expected to be completed in 2 years and 9 months.

4. The table below provides a summary of the project costs of the ten enterprises.

Project Costs of Enterprises in the Group Project

Enterprise	CFC ODP tonnes	Incremental capital costs	Deductions	Contingency	Incremental Operating Costs/ Savings	Total	Cost-effectiveness US $/kg
Ayom foam	20.4	118,988	-19,800	9,919	-6,981	102,126	5.01
Baochemical	19.5	118,988	-19,800	9,919	450	109,557	5.62
Bravo Foam	19.4	118,988	-19,800	9,919	-2,700	106,407	5.48
Diana Ind.	23.0	118,988	-19,800	9,919	-4,380	104,727	4.55
Latunde Ind.	20.3	232,976	-39,600	19,338	7,180	219,894*	10.83
Sunny Foam	21.3	118,988	-19,800	9,919	-2,030	107,077	5.03
St.Paul Foam	18.0	118,988	-19,800	9,919	-5,400	103,707	5.76
SAC-MAC (Union foam)	21.0	118,988	-19,800	9,919	-6,050	103,057	4.91
ZIV Com. Ind.	17.5	118,988	-19,800	9,919	-2,640	106,467	6.08
Odus Foam	18.8	118,988	-19,800	9,919	-3,790	112,897	6.00
TOTAL	**199.2**	**1,303,868**	**-217,800**	**108,609**	**-18,761**	**1,175,916**	

* Requested grant: US $126,469 (cost-effectiveness: US $6.23/kg). Total grant requested US $1,082,491.

Bamako Industrial Ltd.

5. Bamako consumed 24 tonnes CFC-11 in 2000 in the production of slabstock foam for mattresses and furniture applications using a Hyma Maxfoam. The total capital cost of conversion amounts to US $142,800 which includes US $113,000 for equipment (methylene chloride storage tank, methylene chloride metering system, machine enclosure and ventilation facility) and US $29,800 for trials, technology transfer and training. Incremental operating savings of US $6,490 are realized. The project is expected to be completed in 2 years and 9 months.

Rigid Foam

Agric Services (NIG) Ltd.

6. Agric Services consumed 47.5 ODP tonnes of CFC-11 per year (average 1998-2000). The enterprise produces rigid polyurethane foam thermoware products. It currently operates four low-pressure dispensers. The enterprise will phase out the use of CFC-11 by converting to HCFC-141b as the foam blowing agent. The project includes incremental capital costs covering the replacement of existing low-pressure dispensers with high-pressure models at US $18,000 each, trials (US $6,400), technology transfer and training (US $5,000). Incremental operating cost of US $158,860 is requested. The project is expected to be completed in 2 years.

Justification for the use of HCFC-141b

7. The project proposal meets the Executive Committee's requirements for the selection of HCFC-141b technology as the alternative technology. The letter of transmittal of the Government of Nigeria endorsing the company's use of the technology is attached.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

8. All the projects meet the relevant requirements of Executive Committee Decision 33/2.

Flexible Slabstock Foam

Ten Boxfoam Enterprises (Group project)

9. The Secretariat identified some technical and cost issues relating to the replacement of the existing manual boxfoam machines with semi-automatic ones. The Secretariat and UNDP discussed the issues and agreed on the eligible grant of the project as US $1,062,808. It was also agreed to keep the issues relating to the replacement of manual boxfoams in this and similar projects in view and to continue to examine available options with the view to designing more cost-effective projects.

Bamako

10. The Secretariat and UNDP discussed the technical issues identified and agreed on the project grant of US $114,510.

Rigid Foam

Agric Services Co.

11. The duration of 2 years proposed by UNDP for completing the project is 9 months shorter than in similar HCFC-141b projects previously approved for UNDP in Nigeria. The cost of the project was agreed as US $239,160.

RECOMMENDATIONS

12. The Fund Secretariat recommends blanket approval of the Bamako Industrial, 10 Boxfoam Enterprises (Group Project) and the Agric Services projects with the level of funding and associated support costs indicated in the table below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	Phasing out of CFC-11 in the manufacture of flexible slabstock foam at Bamako Industrial Ltd. by conversion to methylene chloride	114,510	14,886	UNDP
(b)	Conversion from CFC-11 to methylene chloride (MC) technology in the manufacture of flexible polyurethane at ten (10) box-foam enterprises in Lagos area (group project)	1,062,808	126,909	UNDP
(c)	Phasing out of CFC-11 in the manufacture of rigid polyurethane foam at Agric Services (Nig.) Ltd. by conversion to a combination of water+HCFC-141b based systems	239,160	31,091	UNDP

PROJECT EVALUATION SHEET
NIGERIA

SECTOR: Refrigeration ODS use in sector (2000): 959.81 ODP tonnes

Sub-sector cost-effectiveness thresholds: Commercial US $15.21/kg
Domestic US $13.76/kg

Project Titles:

(a) Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Polade
(b) Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of domestic and commercial refrigeration equipment at Ristian

Project Data	**Multiple-subsectors**	**Multiple-subsectors**
	Polade	**Ristian**
Enterprise consumption (ODP tonnes)	8.59	11.45
Project impact (ODP tonnes)	8.27	10.96
Project duration (months)	28	28
Initial amount requested (US $)	70,382	163,169
Final project cost (US $):		
Incremental capital cost (a)	61,000	126,000
Contingency cost (b)	3,920	9,240
Incremental operating cost (c)	5,462	8,489
Total project cost (a+b+c)	70,382	143,729
Local ownership (%)	100%	100%
Export component (%)	0%	0%
Amount requested (US $)	70,382	143,729
Cost effectiveness (US $/kg.)	8.51	13.10
Counterpart funding confirmed?	Yes	Yes
National coordinating agency	Federal Ministry of Environment	
Implementing agency	UNIDO	

Secretariat's Recommendations		
Amount recommended (US $)	70,382	143,729
Project impact (ODP tonnes)	8.27	10.96
Cost effectiveness (US $/kg)	8.51	13.10
Implementing agency support cost (US $)	9,150	18,685
Total cost to Multilateral Fund (US $)	79,532	162,414

PROJECT DESCRIPTION

Sector Background

Latest available total ODS consumption (1999)	4,970.40 ODP tonnes
Baseline consumption of Annex A Group I substances (CFCs)	3,650.00 ODP tonnes
Consumption of Annex A Group I substances for the year 1999	4,286.20 ODP tonnes
Baseline consumption of CFCs in refrigeration sector	N.A. ODP tonnes
Consumption of CFCs in refrigeration sector in 2000	959.81 ODP tonnes
Funds approved for investment projects in refrigeration sector as of end of 2000	US$4,995,536.00
Quantity of CFC to be phased out in investment projects in refrigeration sector as of end of 2000	304.80 ODP tonnes

13. The Executive Committee has approved about US $4,995,536 for 13 projects to phase out 304.8 ODP tonnes of CFC for enterprises manufacturing refrigeration equipment in Nigeria.

14. Two projects for enterprises in the commercial refrigeration sub-sector in Nigeria have been submitted by UNIDO for consideration at the 35th Meeting of the Executive Committee.

Project description

15. The two enterprises (Polade and Ristian) consumed 11.14 ODP tonnes of CFC-11 and 8.56 ODP tonnes of CFC-12 (in 2000) in the manufacture of commercial and domestic refrigeration equipment. Ristian is involved in the production of domestic refrigerators and freezers and commercial ice-block makers while Polade manufactures ice-block makers and cold storage rooms. The enterprises operate low-pressure foam dispensers, production and portable refrigerant charging machines, vacuum pumps and leak detectors in the baseline.

16. The total phase out of 19.7 ODP tonnes of CFC-11 and CFC-12 will be achieved by converting CFC-11 based technology to HCFC-141b as the foam blowing agent and CFC-12 to HFC-134a as the refrigerant in the two companies. Under the current projects, high-pressure dispensers will replace the existing low-pressure foaming machines. All enterprises will require provision of industrial or portable charging units, vacuum pumps and leak detectors suitable for use with HFC-134a. Other costs include re-design, prototyping, technical assistance and training. Incremental operating costs are requested by the enterprises reflecting the higher cost of chemicals and components.

17. In accordance with decisions of the Executive Committee on the use of HCFCs, a letter of transmittal from the Government of Nigeria endorsing the use of HCFC-141b by the companies is attached.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

18. Ristian is involved in production of cold stores, which are installed in-situ and equipped with compressors above 5kWt. The Secretariat and UNIDO agreed that Decision 31/45 on guidelines for the sub-sector for assembly, installation and charging of refrigeration equipment shall apply in the case of Ristian. Incremental operating costs (IOC) associated with production of cold stores (refrigerant part) were recognised as ineligible for funding. The cost-effectiveness threshold of US $7.83/kg ODP was applied to determine the level of eligible incremental costs for the foam part of the project. The budget of the project was revised accordingly

RECOMMENDATIONS

19. The Secretariat recommends blanket approval of the projects at the funding level indicated below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of commercial refrigeration equipment at Polade	70,382	9,150	UNIDO
(b)	Replacement of refrigerant CFC-12 with HFC-134a and foam blowing agent CFC-11 with HCFC-141b in the manufacture of domestic and commercial refrigeration equipment at Ristian	143,729	18,685	UNIDO

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Date 15TH MAY 20001

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Attn: R. Oshima

I am directed to inform you that in line with the EX.COM decision 27/13 and in recognition of Art 2 of the Montreal Protocol regarding the use of HCFC in Foam Projects specifically at **Ristian Technical Co. Ltd** and **Polade Services Co. Ltd**. The Government and the Company have received full information about the technology and the existing option for this sector.

2. The use of HCFC is justified because this option will maintain insulation critical values for the product. The option requires minimum change at the manufacturing plant and is commercially available and economically visible in Nigeria. Other options to replace CFC 11 in this industry include:

i. Water blown technology: For this technology appropriate formulation are not available yet in Nigeria;
ii. Hydrocarbons: The Safety Issues are very critical;
iii. HFC: Up till now, this alternative is not commercially available.

3. The Government and the two Companies are aware that HCFCs are transitional substances, an understand that no funding will be sought from the Multilateral Fund for the conversation from HCFC for **Ristian Technical Co. Ltd.** and **Polade Services Co. Ltd.** whenever such conversion to other alternatives will be required.

4. We hope that this justification complies with the EX.COM decision.

Dr. D.B.Omotosho
for Honourable Minister