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EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Thirty-second Meeting  
Ouagadougou, 6-8 December 2000

**PROJECT PROPOSALS: NIGERIA**

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

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 Coldcare Nigeria Ltd. UNIDO
- 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 Akocen Nigeria Ltd. UNIDO
- 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 Bosmak Nigeria Ltd. UNIDO

## PROJECT EVALUATION SHEET NIGERIA

SECTOR: Refrigeration ODS use in sector (1998): 991.6 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 Akocen Nigeria Ltd.
- (b) 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 Coldcare Nigeria Ltd.
- (c) 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 Bosmak Nigeria Ltd.

Project Data	Commercial	Commercial	Multiple-subsectors
	Akocen	Coldcare	Bosmak
Enterprise consumption (ODP tonnes)	12.80	12.10	11.37
Project impact (ODP tonnes)	12.12	11.43	10.77
Project duration (months)	30	30	30
Initial amount requested (US \$)	180,664	173,700	154,245
Final project cost (US \$):			
Incremental capital cost (a)	133,300	150,000	131,500
Contingency cost (b)	10,830	11,700	12,150
Incremental operating cost (c)	13,764	11,500	10,595
Total project cost (a+b+c)	157,894	173,200	154,245
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
<b>Amount requested (US \$)</b>	157,894	173,200	154,245
Cost effectiveness (US \$/kg.)	13.03	15.15	14.32
Counterpart funding confirmed?	Yes	Yes	Yes
National coordinating agency	Federal Ministry of Environment		
Implementing agency	UNIDO	UNIDO	UNIDO

<b>Secretariat's Recommendations</b>			
Amount recommended (US \$)	157,894	173,200	154,245
Project impact (ODP tonnes)	12.12	11.43	10.77
Cost effectiveness (US \$/kg)	13.03	15.15	14.32
Implementing agency support cost (US \$)	20,526	22,516	20,052
Total cost to Multilateral Fund (US \$)	178,420	195,716	174,297

## PROJECT DESCRIPTION

### Sector Background

- Latest available total ODS consumption (1998)	5,476.10 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 1998	4,761.50 ODP tonnes
- Baseline consumption of CFCs in refrigeration sector	Not available ODP tonnes
- Consumption of CFCs in refrigeration sector in 1998	991.60 ODP tonnes
- Funds approved for investment projects in refrigeration sector as of July 2000 (31st Meeting)	US\$4,610,197.00
- Quantity of CFC to be phased out in investment projects in refrigeration sector as of end of 1999	271.00 ODP tonnes

1. According to the updated statistics presented in project proposals, 1,844 ODP tonnes were used in 1998 as refrigerants, and of this amount, 293 ODP tonnes were used for initial charge and 1,550 tonnes for servicing. The Executive Committee has approved about US\$ 4,610,197 for 11 projects to phase out 271 ODP tonnes of CFC for enterprises manufacturing refrigeration equipment in the refrigeration sector.

2. Two of the three projects are in the commercial refrigeration sub-sector (Akocen and Coldcare), whereas the third (Bosmak) is a multiple sub-sector project. The enterprises have similar consumption figures and conversion strategies. Therefore, they will be grouped for the purposes of the project description.

### **Akocen, Bosmak and Coldcare**

3. The three enterprises (Akocen, Bosmak and Coldcare) consumed 25.68 ODP tonnes of CFC-11 and 10.59 ODP tonnes of CFC-12 in the manufacture of commercial and domestic refrigeration equipment in 1998. Akocen and Coldcare manufacture commercial ice block machines; Coldcare produces water coolers. Bosmak produces domestic refrigerators ranging in size from 120 to 200 litres, it also produces commercial refrigeration units. All enterprises operate low-pressure foam dispensers in the baseline.

4. The current projects will phase out 25.68 ODP tonnes of CFC-11 and 10.59 ODP tonnes of CFC-12 in the manufacture of commercial and domestic refrigeration equipment at the three enterprises. This will be achieved by converting CFC-11 to HCFC-141b as the foam blowing agent, and CFC-12 to HFC-134a as the refrigerant. Under the current projects, the existing low-pressure machines will be replaced by high-pressure dispensers (US \$85,000 each). All enterprises will require charging units (US \$20,000 each), vacuum pumps and leak detectors (US \$6,000-6,500 each). Other costs include consultancy fees (US \$5,000 each), re-design, testing, trials and training (US \$10,000-20,000 each). Incremental operating costs are requested by the enterprises reflecting the higher cost of chemicals and an increase in foam density.

Justification for the use of HCFC-141b

5. The three enterprises have selected HCFC-141b technology to replace CFC-11 in their foam blowing operations. It is an interim solution until non-CFC systems (different from hydrocarbons) are commercially available. A letter advising the Government decision to use HCFC technology has been received by the Secretariat in accordance with the Executive Committee Decision 27/13 and is attached to this evaluation together with a justification from the implementing agency.

**SECRETARIAT'S COMMENTS AND RECOMMENDATIONS****COMMENTS**

1. The Secretariat has discussed with UNIDO the eligible cost of the replacement of a low pressure dispenser in Akocen which is about 15 years old. The funding of a new high pressure foaming machine has been reduced accordingly. The cost of new vacuum pumps has been adjusted to reflect the cost of retrofitting instead of replacement of a number of the existing vacuum pumps.

**RECOMMENDATIONS**

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

	<b>Project Title</b>	<b>Project Funding (US\$)</b>	<b>Support Cost (US\$)</b>	<b>Implementing Agency</b>
(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 Akocen Nigeria Ltd.	157,894	20,526	UNIDO
(b)	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 Coldcare Nigeria Ltd.	173,200	22,516	UNIDO
(c)	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 Bosmak Nigeria Ltd.	154,245	20,052	UNIDO

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The Director,  
 Montreal Protocol Unit,  
 SES/IEE,  
 UNIDO, Vienna  
 43-1-213463026  
 Attention: Mrs. H.S. Yakindag/Dr. R. Oshima

**Subject: Projects Involving HCFCs**

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

- 1) verifies that it had reviewed the specific situation at the enterprises: Akocen Nig.Ltd, Bosmak Nig. Ltd., Coldcare Nig. Ltd. as well as their HCFC commitments under the Article 2F;
- 2) states that based on the prevailing circumstances at:

Akocen Nigeria Ltd.  
 Bosmak Nigeria Ltd.  
 Coldcare Nigeria Ltd.

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;

3. confirms that the Government and the recipient enterprises understood that no funding will 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.

A handwritten signature in black ink, appearing to read 'D. B. Omotosho'.

**Dr. D.B. Omotosho,**  
 ( National Ozone Officer )  
 for Hon. Minister.