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EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Forty-fourth Meeting  
Prague, 29 November-3 December 2004

**PROJECT PROPOSAL: ZIMBABWE**

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

Refrigeration

- Terminal phase-out management plan for CFCs (first tranche) Germany

**PROJECT EVALUATION SHEET  
ZIMBABWE**

<b>PROJECT TITLE</b>	<b>BILATERAL/IMPLEMENTING AGENCY</b>
Terminal phase-out management plan for CFCs (first tranche)	Germany

<b>NATIONAL CO-ORDINATING AGENCY:</b>	National Ozone Unit
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**LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT****A: ARTICLE-7 DATA (ODP tonnes, 2003 as of October 2004)**

Annex A Group I, CFCs	117.50		
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**B: COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes, 2003 as of October 2004)**

ODS Name	Sub-sector/quantity	Sub-sector/quantity	Sub-sector/quantity	Sub-sector/quantity
CFCs	Refrigeration servicing 117.47			

<b>CFC consumption remaining eligible for funding (ODP tonnes)</b>	418.00
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<b>CURRENT YEAR BUSINESS PLAN ALLOCATIONS</b>		<b>Funding US \$</b>	<b>Phase-out ODP tonnes</b>
	(a)	50,000	20.00

<b>PROJECT TITLE:</b>	<b>(a)</b>
<b>ODS use at enterprise (ODP tonnes):</b>	117.5
<b>ODS to be phased out (ODP tonnes):</b>	*
<b>ODS to be phased in (ODP tonnes):</b>	n/a
<b>Project duration (months):</b>	12
<b>Initial amount requested (US \$):</b>	1,841,000
<b>Final project cost:</b>	
Incremental Capital Cost (US \$)	
Contingency (10%) (US \$)	
Incremental Operating Cost (US \$)	
Total Project Cost (US \$)	280,000
<b>Local ownership (%):</b>	100
<b>Export component (%):</b>	0
<b>Requested grant (US \$):</b>	280,000**
<b>Cost-effectiveness (US \$/kg):</b>	n/a
<b>Implementing agency support cost (US \$):</b>	36,400
<b>Total cost of project to Multilateral Fund (US \$):</b>	316,400
<b>Status of counterpart funding (Y/N):</b>	n/a
<b>Project monitoring milestones included (Y/N):</b>	Y

<b>SECRETARIAT'S RECOMMENDATION</b>	For individual consideration
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\* To be in compliance with the 2005 Montreal Protocol limits (CFC baseline is 451.40 ODP tonnes)

\*\* For phase I of the revised proposal.

## PROJECT DESCRIPTION

1. The Government of Zimbabwe submitted for consideration by the Executive Committee at its 44th Meeting a terminal phase-out management plan (TPMP) for CFCs. The activities proposed in the TPMP will ensure Zimbabwe's continued compliance with the CFC consumption limits established under the Montreal Protocol. The cost of the TPMP, as submitted is US \$2,625,500 (excluding agency support costs) for the phase-out of 357 ODP tonnes of CFCs.

### Overview of ODS consumption

2. On the basis of Decision 35/57, the remaining CFC consumption eligible for funding for Zimbabwe is 418.1 ODP tonnes (after deducting 12.1 ODP tonnes associated with the institutional strengthening project renewal approved at the 43rd Meeting of the Executive Committee). The CFC baseline for Zimbabwe is 451.4 ODP tonnes.

3. Due to the economic constraints prevailing in Zimbabwe over the last five years, ODS consumption has decreased significantly, as shown in the table below:

<b>Year</b>	<b>CFCs (ODP tonnes)</b>	<b>Methyl bromide (ODP tonnes)</b>
1999	229.1	490.0
2000	140.0	373.0
2001	259.4	544.2
2002	129.3	202.3
2003	117.7	97.3

4. Since the approval of the Zimbabwe RMP project proposal (at the 26th Meeting of the Executive Committee, as part of the RMP proposal for 14 African countries), no other CFC phase-out activities have been submitted by the Government of Zimbabwe for consideration by the Executive Committee. Also, no halon consumption has been reported in Zimbabwe since 1996. There is currently less than 6 metric tonnes of halons stocked for emergency use by Defence, Civil Aviation and the Zimbabwe Electricity Supply Authority. Zimbabwe is part of the regional halon bank project for southern and eastern African countries currently being implemented by the Government of Germany (this project will address all halon stockpiles).

### ODS legislation

5. The Government of Zimbabwe drafted ODS regulations in 2000 and finally approved them under the Environment Management Act on 1 July 2004. The regulations stipulate, *inter alia*, that:

- (a) All importers of ODS and/or ODS-based equipment must submit to the Ozone Unit an ODS import/export permit (the Ozone Unit has been empowered to approve import permits);

- (b) All permits are valid for one year; they must be renewed at the end of that period and are not transferable; and
- (c) Penalties will be enforced if the regulations' provisions are not followed.

#### Refrigeration manufacturing sector

6. There are five major refrigeration manufacturing/assembling companies in Zimbabwe. (Ajax Refrigeration, Imperial Derby Refrigeration Ltd., Capri Refrigeration, Commercial Refrigeration, Ref-air Refrigeration). At its 20th Meeting, the Executive Committee approved funding for the conversion of all five manufacturing plants from CFCs to non-CFC technologies (US \$678,679). With the assistance of the World Bank, the five projects were completed between January 1997 and August 2001 and a total of 35.6 ODP tonnes of CFCs were phased out.

7. Over the last few years, the refrigeration manufacturing plants have had only limited production; in some cases, annual production is less than 100 units. Conversely, the sale of re-assembled cooling equipment and the import of used CFC-based refrigeration equipment, including compressors, have increased.

#### Refrigeration servicing sector

8. In 2003, 117.7 ODP tonnes of CFCs were used to service refrigeration equipment, broken down as follows:

<b>Equipment type</b>	<b>Units serviced annually</b>	<b>CFCs (ODP tonnes)</b>
Domestic refrigerators	112,500	18.0
Commercial refrigerators	11,700	58.5
Refrigerated containers	7,250	7.2
MAC units	12,250	24.5
Window air-conditioning units	10,200	2.5
Chillers	70	7.0
<b>Total</b>		<b>117.7</b>

9. The refrigeration and air conditioning sector is the single largest consumer of CFCs in Zimbabwe. There are approximately 2.2 million CFC-based domestic refrigerators and a significantly smaller number of domestic air conditioning equipment in the country. Currently, there are 3,000 to 5,000 individuals, working mostly in the semi-formal or informal sector, who repair small refrigeration and air-conditioning systems in the country. The technicians' varied technical skills and the lack of tools have led to the prevalence of bad refrigeration servicing practices. For example, CFCs are often used to flush systems.

10. Commercial refrigeration equipment is commonly used in food processing enterprises (dairy, meat, fisheries and supermarkets). The decline in Zimbabwe's food production since the early 1990s has meant that a large number of commercial refrigeration systems are either seldom or no longer used (i.e., of the 78,000 units that were in operation in 1998, only 20,000 units are

currently in operation). Of the estimated 3,000 CFC-based refrigerated containers in the country, less than 600 are currently in operation.

11. Commercial air-conditioning units are commonly used in hospitals, hotels and office buildings. However, of the 200 hospitals in the country, only 50 have a central CFC-based air-conditioning system; these systems are old, with very high leakage rates requiring frequent refrigerant charging. Also, less than half of the 350,000 vehicles fitted with CFC-based MAC units are in operation. MAC units are serviced 2 to 3 times a year, largely because of the poor conditions of the country's roads. Only the newer vehicles are fitted with HFC-134a MAC units.

12. The current prices of refrigerants per kg are: US \$9.15 for CFC-11, US \$4.10 to US \$8.20 for CFC-12, US \$7.60 to US \$14.20 for HFC-134a and US \$3.40 to US \$6.35 for HCFC-22. The different prices for the same refrigerant in the country are due to the transportation costs involved.

#### Status of approved projects in the refrigeration servicing sector

13. So far, the Executive Committee has approved the following projects in the refrigeration servicing sector in Zimbabwe:

- (a) Implementation of a CFC refrigerant recovery and reclamation project, approved at the 17th Meeting, implemented by UNIDO (US \$312,300). Under the project, 120 CFC recovery units were to be distributed among the 450 formal service workshops that existed in the country, and 2 recycling centres were to be established. It was estimated that 47 ODP tonnes of CFCs would be recovered and recycled. Based on the information available, of the total number of recovery units, 80 units are still stored by the company that was selected for their distribution. The remaining 40 recycling units were loaned out to companies, but there are no available records of their current location and status;
- (b) Assistance in the design of policies and regulations (a component of the RMP project), approved at the 26th Meeting, implemented by Germany. ODS regulations have been enforced since 1 July 2004;
- (c) Regional training course for customs officers from Botswana, Ethiopia, Malawi, Mozambique, Zambia and Zimbabwe where four customs officers and the Head of the Ozone Unit from each country were trained as trainers. Subsequently, the Zimbabwe Revenue Authority (which is responsible for all customs-related matters) held a two-day workshop to train 22 customs officers. However, the Revenue Authority has been unable to conduct regular training courses for the customs officers as in the past due to lack of resources; and
- (d) Training programme for refrigeration service technicians, implemented as part of regional activities for 14 southern and eastern African countries. Six refrigeration technicians were trained in Germany as trainers in good refrigeration servicing practices. The trainers conducted three additional training courses for

45 technicians as part of the RMP activity. No additional courses were implemented due to lack of financial resources.

Activities proposed in the TPMP

14. The analysis of future CFC demand in Zimbabwe is complicated. The election scheduled in early 2005 is expected to reactivate the economy, which will in turn increase consumption of CFCs to levels similar to the late 1990s (360 ODP tonnes) as refrigeration equipment that is presently idle becomes operational. Under these circumstances, Zimbabwe could be found to be in non-compliance with its 2005 and 2007 phase-out obligations.

15. Based on the CFC consumption pattern in Zimbabwe and the potential increase in the level of CFC consumption, as the national economy is reactivated, the Government of Zimbabwe is proposing to implement the following activities to phase out a total CFC consumption of about 360 ODP tonnes, to ensure compliance with the Montreal Protocol's phase-out targets.

- (a) Technical assistance with the implementation of the licensing and quota system (US \$88,500), to develop a database of importers and distributors of ODS and ODS-based equipment, implement the quota system, address the national tariff system and increase awareness among major stakeholders regarding the ODS regulations and the quota system;
- (b) Enhancement of the enforcement authorities' capacity to control trade in ODS (US \$217,500), to conduct further training of customs officers in ODS regulations and issues related to illegal trade, and provide ODS identification kits to all border posts and central customs laboratories;
- (c) Technical assistance to the refrigeration and air conditioning servicing sector (US \$394,000), to conduct further training for refrigeration service technicians in good servicing practices, to provide basic equipment to the training centres and to provide essential servicing tools to workshops that have sent their technicians for the training course and are found to be inadequately equipped;
- (d) Refrigeration technician certification and licensing (US \$200,000) for the technicians who are handling refrigerants to promote good servicing practices. All service technicians would be certified by 2009;
- (e) Technical assistance for the MAC sub-sector (US \$291,500), to provide training in good practices for technicians servicing the MAC sub-sector, to establish a MAC recovery and recycling network and to create an incentive programme to encourage retrofitting MAC units to use non-CFC refrigerants;
- (f) Creation of an incentive scheme for the commercial refrigeration end-user sector (US \$1,000,000), that would assist end users by providing a subsidy for retrofitting or replacing their CFC-based equipment. This scheme is crucial to prevent Zimbabwe from becoming non-compliant due to an increase in the use of currently idle CFC-based refrigeration equipment;

- (g) Restarting of the recovery and recycling network (US \$184,000), to identify service workshops that could potentially receive one of the recovery machines purchased through the approved recovery and recycling programme, to provide additional training in recovery/recycling practices, to supply additional recovery machines and to establish the recycling centres; and
- (h) Monitoring of activities to ensure effective implementation of the TPMP (US \$250,000), to establish a project management unit responsible for the implementation of the project, in continuous liaison with the Ozone Unit.

16. The cost of implementing the TPMP amounts to US \$2,625,500, to be requested in two tranches: US \$1,841,000 in 2004 and US \$784,500 in early 2008.

## **SECRETARIAT'S COMMENTS AND RECOMMENDATION**

### **COMMENTS**

17. The TPM as submitted was developed to address the phase-out of 357 ODP tonnes of CFCs representing the level of consumption expected under normal economic circumstances. However, the Secretariat noted that the incremental costs of the TPMP can only be based on the current level of consumption, i.e., 117.5 ODP tonnes.

18. The Secretariat discussed with the Government of Germany the following issues related to CFC consumption in the refrigeration sector in Zimbabwe: the relationship between the reported decrease in the level of CFC consumption and the increase in importation of CFC-based equipment, including compressors; the amount of CFC used during refrigeration-system servicing; the potential amount of CFCs to be recovered from commercial refrigeration systems and MAC units; the extent to which non-CFC based equipment is serviced with CFC-12 due to the price difference between CFC and non-CFC refrigerants; and the wide price range for the same type of refrigerant. All of these issues were addressed and further documented by the Government of Germany.

#### Proposal by the Secretariat

19. On the basis of the review of the CFC phase-out plan for Zimbabwe, the Secretariat noted that the refrigeration servicing sector in Zimbabwe has characteristics that most Article 5 countries do not share. A comparison of a range of indicators shows that Zimbabwe's economy has been contracting. Therefore:

- (a) CFC consumption decreased from 435.4 ODP tonnes in 1997 to 117.7 ODP tonnes in 2003 (current CFC consumption reported under Article 7 is 317.7 ODP tonnes below the CFC baseline for compliance; 108 ODP tonnes below the 2005 compliance level and 50 ODP tonnes above the 2007 compliance level);
- (b) The number of formal refrigeration service workshops (estimated at 450 in 1999) has been reduced in recent years due to the country's limited economic activity.

Furthermore, the lack of work opportunities has led to the migration of a large number of qualified refrigeration technicians to neighbouring countries;

- (c) The long-term sustainability of the incentive programme for commercial refrigeration end users is jeopardized by the prevailing economic circumstances in the country and the price differences between CFCs and non-ODS refrigerants;
- (d) The request for additional recovery and recycling units has to be further substantiated, given the system's high leakage rate, the limited number of systems in operation, the age of the equipment and the substantial number of idle medium- and large-size refrigeration equipment, as well as the evident failure of the first recovery and recycling project; and
- (e) The cost-effectiveness of the project (US \$22.44/kg on the basis of current CFC consumption) is more than four times the cost-effectiveness of the refrigeration servicing sector component of all phase-out plans approved by the Executive Committee (US \$5/kg).

20. Based on the above observations, the Secretariat concluded that the terminal CFC phase-out plan as submitted was not sound, and that its short- and long-term sustainability was doubtful. The Secretariat therefore suggested to the Government of Germany that the project be re-developed as a two-phase proposal for phase-out of CFCs in Zimbabwe. In Phase I (2004-2006), with a total cost of US \$280,000, the following activities could be addressed:

- (a) Assistance for the development and implementation of the licensing and quota system and training of customs officers;
- (b) Additional training for customs officers;
- (c) Additional training of refrigeration service technicians in good servicing practices, including leak detection and repair and use of CFC refrigerant alternatives;
- (d) Technical assistance programme in the refrigeration servicing sector, including the restarting of the recovery and recycling project approved at the 17th Meeting of the Executive Committee and providing basic tools for the registered service workshops, including vacuum pumps, leak detectors, scales, service hoses, recovery bags and small cylinders, to reduce the amount of CFC used during servicing operations; and
- (e) Monitoring and management unit for the RMP sub-projects.

21. At the end of Phase I (2006), the Government of Zimbabwe would submit a comprehensive report on the activities undertaken and results achieved, including the amount of CFCs permanently phased out and the remaining level of consumption to be phased out to meet the 2007 and 2010 control measures. The report would be reviewed by the Secretariat before submission to the Executive Committee. The Government of Zimbabwe could then be advised,

through the Government of Germany as the lead implementing agency, to prepare and submit Phase II of the project to achieve the 2007 phase-out level and complete CFC phase-out in the servicing sector by 2010. The activities in Phase II would be identified at that time, as those best suited to the prevailing circumstances and needs of the country, as well as the current level of ODS consumption.

22. Subsequently, the Government of Germany agreed to redesign the project proposal with reference to the suggestions made by the Secretariat.

## **RECOMMENDATION**

23. The Executive Committee may wish to consider approval of phase I of the TPMP for Zimbabwe at the funding level of US \$280,000 plus agency support costs of US \$36,400 for the Government of Germany, subject to the following conditions:

- (a) Zimbabwe would achieve at least the 2005 Montreal Protocol CFC reduction target without further assistance from the Multilateral Fund; and
- (b) In 2006, the Government of Zimbabwe would submit a comprehensive report on the implementation of phase I together with a request for phase II of the project to achieve complete CFC phase-out in the servicing sector containing activities best suited to the circumstances and needs of the country identified at that time. The progress report should include the activities undertaken and results achieved, the amount of CFCs permanently phased out and the remaining level of consumption to be phased out.

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