

ZAMBIA

INTRODUCTION

Although Zambia places the management of the environment and natural resources as one of its priority areas, projects related to the direct monitoring of ozone in the stratosphere none existent. Through the Environmental Council of Zambia (ECZ), the country runs programmes to manage, monitor and protect the environment and natural resources including effects that could result from the modification of the ozone layer from the stratospheric air pollution.

Zambia is classified under Article 5, Paragraph 1 of the Montreal Protocol (MP) since its consumption per capita of Annex A, Group 1 chemicals is less than 0.3kg ODP per year. The country has no manufacturing facilities for any substances controlled under the Montreal Protocol. The total demand for Annex A, Group1 and Annex B Group I, II, III chemicals is met through imports.

Zambia's uses controlled substances in the servicing of refrigerators, freezers and mobile air conditioners. The refrigeration sector in Zambia can be broken down into sub-sectors according to the levels of consumption as shown in Table 1.

Table 1: Consumption of ODS in the refrigeration sector in Zambia.

Refrigeration Sector	Percent
Commercial and Industrial Refrigeration	73.5
Domestic Refrigeration	24.5
Mobile A/C Units	2.0
Total	100

Status of Ratification

Zambia made an accession to the Vienna Convention for the Protection of the Ozone Layer and the MP for the phase-out of the Substances that Deplete the Ozone Layer on 24th January, 1990. It ratified the London Amendment on 15th April, 1992 and Government is in the process to ratify the Copenhagen, Beijing and Montreal amendments.

THE COUNTRY PROGRAMME

Zambia has received technical and financial support through The United Nations Environment Programme (UNEP) as an implementing agency of the MP. The Country Programme was approved at the 8th Meeting of the Executive Committee in 1992 for funding by the Multilateral Fund. The country programme was derived from the ODS consumption data that was collected in 1991. The consumption pattern showed more than 90% of ozone depleting substances associated with the use of chlorofluorocarbons (CFCs) based refrigerants used in cooling systems such as refrigerators and air conditioners. Since then, several measures were initiated to meet the MP requirements of the 50% cut in consumption by 2005 and the 85% cut by 2007, leading to 100% phase-out by 2010.

Consumption Trends of ODS in Zambia

In the Refrigeration Sector, CFC -12 is the most widely used. During the past 12 years, the overall consumption of CFCs in Zambia was as follows:

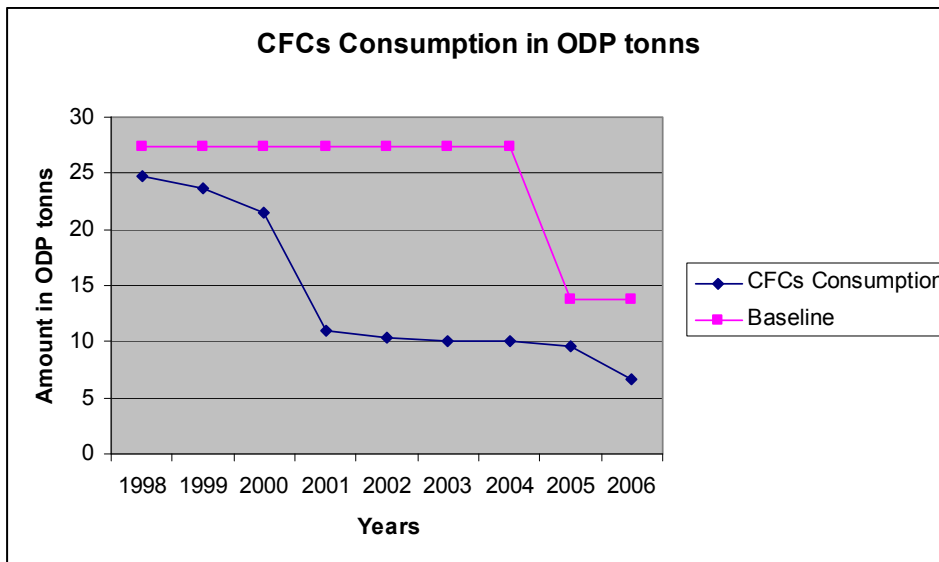


Figure 1: Trend of CFC-12 Consumption in tonnes

Zambia met its phase-out target in 2005 and seems well positioned to meet the 2007 and 2010 overall CFC phase-out targets set by the MP. To reduce the CFC refrigerant on imports, the government has chosen retrofit of equipment where possible and use the recovery and recycling systems as a principle strategy to achieve CFC phase-out.

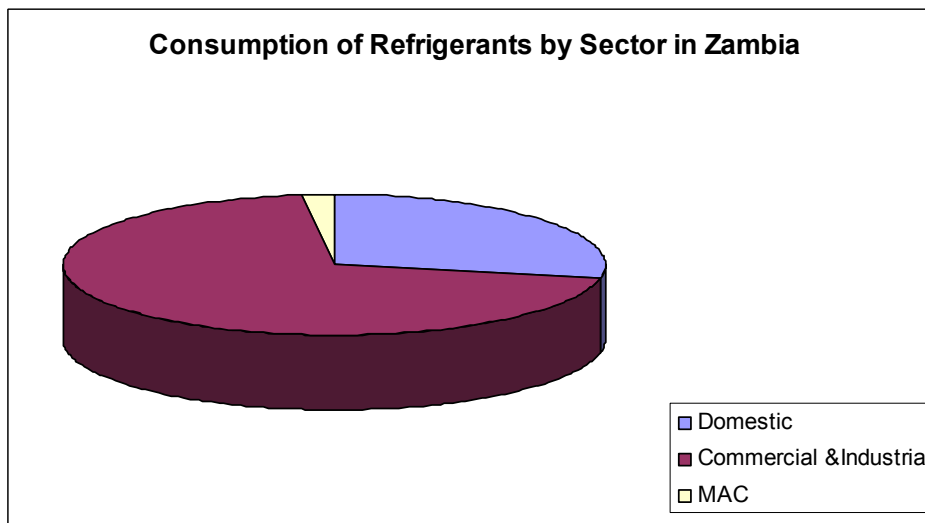


Figure 2: Refrigeration Sectors in Zambia.

Domestic refrigeration sectors

The importation of domestic refrigerators and air conditioners is increasing, however since 2002 all new imported fridges, freezers and air conditioners are CFC free containing R134a or the transitional refrigerant R22. The new equipment represents 25% of actual number of fridges and freezers. About 24.5% of the imported refrigerants are used for servicing of domestic refrigeration equipments.

Industrial and Commercial Sectors

These sub-sectors include those which use systems of refrigeration for food storage such as abattoirs, the fishing industry, breweries/beverages industry, supermarkets, hospitals and the hotel industry. They represent the largest sector in the cooling industry and have been using about 73.5% of imported refrigerants. The use of recovered CFCs is common compared to other sectors.

Mobile Air Conditioners (MACs) Sector

The number of vehicles in circulation in Zambia has increased by more than 100% from 25000 in 1998 to 50000 in 2005 according to statistics from government. In compiling refrigerant use statistics for this sub-sector it has been assumed that the percentage of cars equipped with MAC has increased. This sector uses about 2% of imported refrigerants. However, all vehicles imported after 1998 have their MAC equipment using HFC134a. This is due to the rising improved skills of MACs servicing sector by the manufacturers of vehicles.

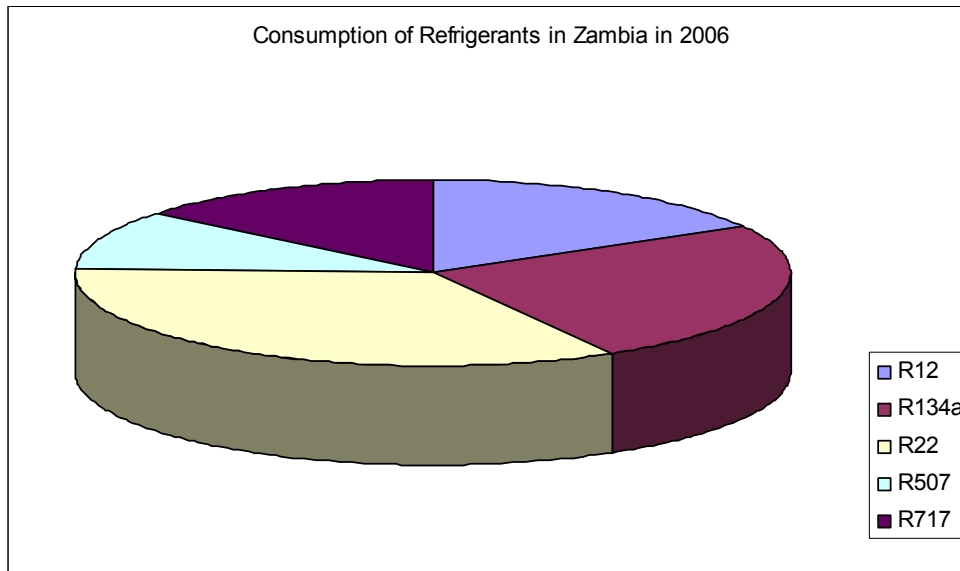


Figure 3: Consumption of Refrigerants in Zambia

The Trend in the Consumption of Refrigerants in Zambia

The consumption of CFC in Zambia seems to be decreasing. This is due to the enforcement measures being applied. Most of the enterprises involved in the sale of display coolers, fridges or freezers are changing to ozone friendly substances and products. The table below shows some of the trends in CFC in relation to alternative substances.

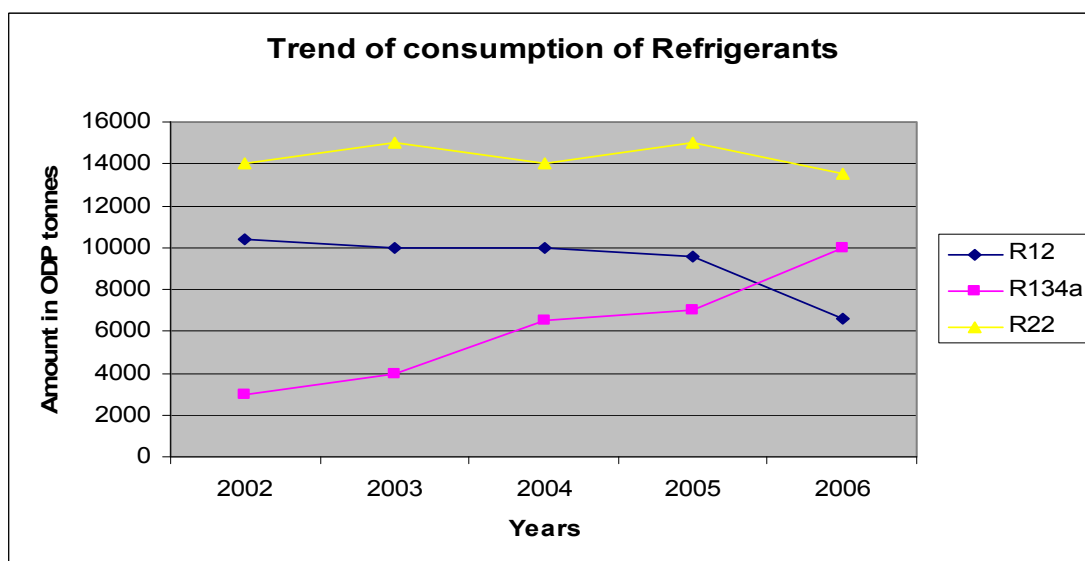


Figure 4: Consumption Trends of R22, R12 and R134a in Zambia in tones.

DISSEMINATION OF INFORMATION ON OZONE IN ZAMBIA

Submission of consumption data to Ozone Secretariat

Zambia is constantly conducting surveys to collect data to determine and monitor its consumption level of Ozone Depleting Substances (ODS). Surveys are conducted to determine the current consumption of ODS and the need to update data on the consumption of ODS in Zambia. This data is analysed in conjunction with the Central Statistics and submitted to the Ozone Secretariat.

Information on ozone issues to the public

The Ozone Unit under the Institutional Strengthening programme being assisted by UNEP has been in effect since 1994. The NOU has raised awareness on ozone related issues among refrigerant workshop managers, service managers, suppliers and distributors of ODS through workshops, print and electronic media, car stickers (1000), posters (5,000) and brochures (10,000) to assist the general public in understanding the protection of the ozone layer.

Awareness activities are also being carried on traders, encouraging them to import ozone friendly equipment using alternative refrigerants to ODS. The NOU has also been coordinating programmes under the RMP on training and legislation development. One of the main achievement of the NOU was the adoption by Government of the Statutory Instrument No. 27 of 2001 on the ODS control Regulations in Zambia.

RELEVANT SCIENTIFIC PAPERS

Scientific papers related to ozone levels are rare due to lack of projects designed to monitor ozone in the stratosphere directly.

However, the University of Zambia is currently in the process of doing this and also there are some studies being done on Climate Change.

PROJECTS AND COLLABORATION

National Projects

The country has received support through several projects under the Multilateral Fund for the implementation of the Montreal Protocol as follows: (1) Country Programme Preparation; (2) Institutional Strengthening; (3) Refrigeration Management Plan and Update; (4) Recovery and Recycling programme; (5) TPMP Preparation.

International Projects

The country has received support through several international consultants on the capacity building of the stakeholders in the ozone protection projects under the Multilateral Fund for the implementation of the Montreal Protocol as follows: (1) Training of Trainers in Refrigeration Management, (2) Training of Trainers for Customs Officers, (3), Training of the legal Consultants on ODS Regulations and Provision of equipment to higher learning and Vocational Training Institutions.

Other collaboration

At the sub-regional level, Zambia is a member of SADC (Southern African Development Cooperation) and member of COMESA (Common Market of Eastern and Southern Africa) and is in cooperation with other states in the harmonisation of the ODS Control Regulations within the region. This prescribes a tight measure of control which aims at preventing trans-boundary movements of ODS between member states.

Currently, a regional project on ozone impacts to crops – a biomonitoring initiative for southern Africa is underway¹. The project under the Air Pollution Information Network for Africa (APINA) to investigate whether ozone damage to crops and other plants is likely to occur in selected Southern African countries. Biomonitoring experiments, using white clover clones (*Trifolium repens* cv.

Regal, NC-S (ozone-sensitive) and NC-R (ozone-resistant)), have been successfully piloted in South Africa, and was implemented in Zimbabwe, Zambia(based at the University of Zambia), Tanzania and Mozambique in the 2007 growing season.

Besides being the first regional biomonitoring initiative in southern Africa, the project will serve as an interface between policy-makers and air pollution scientists involved in APINA. In addition to highlighting the potential consequences of air pollution, the network will also foster regional collaboration in addressing the issue.

FUTURE PLANS

Higher learning institutions such as the University of Zambia are keen to participate in research programmes such as direct monitoring of ozone using specialized and state of the art instrumental techniques. The starting point is the regional project on ozone impacts to crops, although currently ozone measurements are done in Sweden after trapping the ozone with passive samplers. The meteorological Department is also positioned to undertake projects related to ground ozone monitoring.

NEEDS AND RECOMMENDATIONS:

It is recommended that there should be funding to assist the lower ODS consuming countries in:

- Acquiring the necessary equipment for the data gathering.
- Training of the data collection assistance.
- Capacity building of stakeholders institutions data management.
- The technical measures to sustain the data gathering.

References

E. Arone, P. Büker, L. Emberson, G. Krüger, A. Kaaya, A.B. Mashingaidze, V. Shitumbanuma, A.M. van Tienhoven and M. Zunckel , Ozone impacts to crops – a biomonitoring initiative for southern Africa, poster presentation for IGAC conference, Cape Town, September 2006.
