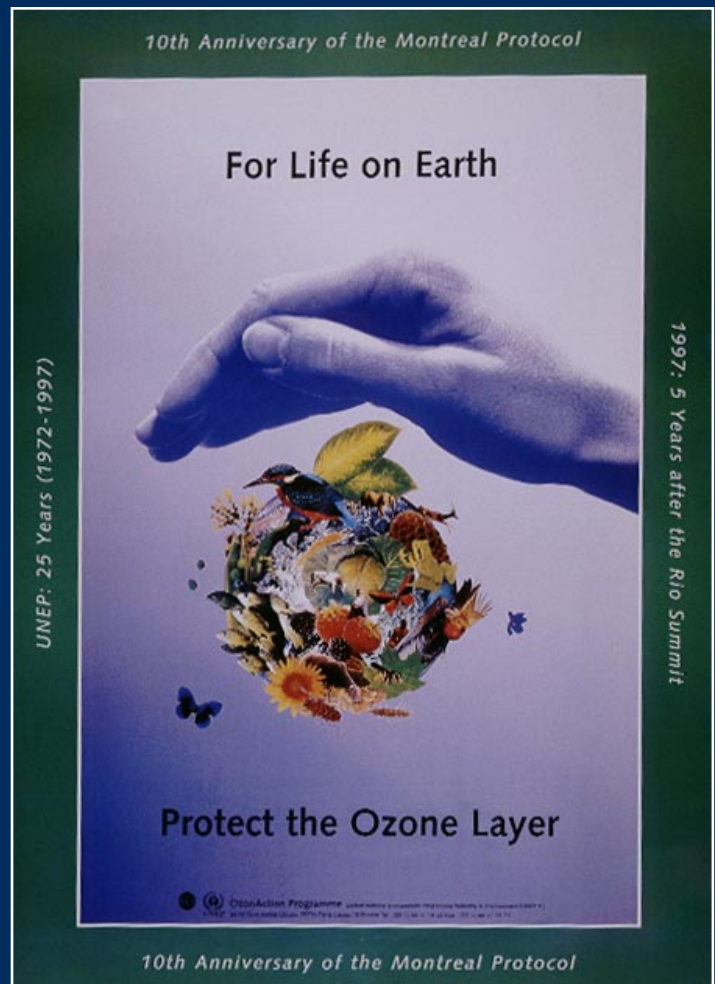


SURPASSING THE MONTREAL PROTOCOL OBJECTIVES:

GHANA'S SUCCESS STORY



National Ozone Unit
Environmental Protection Agency



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Accra, Ghana

FOREWORD

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The marking of the tenth anniversary this year (1997) of the Montreal Protocol on Substances that Deplete the Ozone Layer is an occasion to reflect on the many accomplishments of the international community to protect the fragile ozone layer.

The adoption of the Copenhagen, London and Vienna Amendments to the Montreal Protocol has boosted efforts, particularly in the developed countries, towards an early phase out of ozone depleting substances (ODS).

For developing countries like Ghana, the major challenge is to contribute meaningfully towards the global efforts to protect the ozone layer, while keeping the pace of their economic development. Accordingly, Ghana took some precautionary measures advocated by the Global Earth Summit in Rio de Janeiro (1992) and designed a national strategy for accelerated phaseout of ODS.

As a result of Ghana's strategy for an early phaseout, ODS consumption has decreased by 85% between 1991 and 1996. Three conclusions are evident:

- ▶ Ghana has surpassed the Montreal Protocol objectives: developing countries are only required to freeze their consumption of Annex A group I CFCs to the average level of consumption during the years 1995–1997, by the year 1999.
- ▶ There is clearly a win-win situation. Ghana benefits by being less dependent on an obsolete technology and the ozone layer benefits from an accelerated phase out.
- ▶ Ghana will face a bigger challenge to meet the 1999 freeze because of its reduced consumption for the period from 1995–1997.

Ghana has already shared this success through UNEP's Regional Networks of ODS Officers. Ghana is now committed to further sharing its experiences with other developing countries in order to support their efforts for phasing out ODS. Some strategies and approaches might be directly applicable to other developing countries and costly errors can be avoided. Protecting the ozone layer calls for cooperation between all countries and the development of an all-inclusive strategy that would involve governments, the private sector and individuals.

The Montreal Protocol as a pollution prevention strategy offers a great promise for better management of the fragile ozone layer. We therefore re-affirm Ghana's commitment to the provisions of the Protocol.

LET US SHARE OUR EXPERIENCE!

Ghana's Success Story

GHANA AT THE BASELINE

Ghana became a Party to the Vienna Convention in October 1988 and the Montreal Protocol in October 1989. The country operates under Article 5 of the Protocol and is eligible for assistance under the Multilateral Fund. In October 1992, Ghana's *Country Programme for the Phaseout of ODS*, prepared with assistance of UNEP and the Government of Denmark, was approved by the Multilateral Fund's Executive Committee at its 8th meeting. The data that were collected as part of the Country Programme process confirmed that Ghana only imported ODS (virtually all CFC-11 and CFC-12) and did not produce any of those substances. The total consumption of ODS in 1991 was calculated to be 101.4 ODP tonnes. Two sectors – refrigeration and foams – accounted for the most significant portion of the total ODS consumption (72.8% and 23.8% respectively), while the consumption of ODS in other sectors was negligible. Further investigation revealed that the consumption in the two largest sectors was primarily for servicing of refrigeration equipment and the manufacturing of flexible foam for mattresses and cushions. With a clear understanding of the quantity and distribution of ODS consumption in the country, the Government could now determine which industry sectors should have priority for assistance. The next step was to create a detailed strategy and action plan.

CHOOSING AN AMBITIOUS GOAL

Although the country was permitted under Article 5 to a ten year "grace period", the Government decided on a strategy to implement an accelerated ODS phaseout schedule that was well in advance of the Protocol's requirements. This was deemed possible in part because the Government understood that alternative technology and practices were already available for the refrigeration and foam sectors.

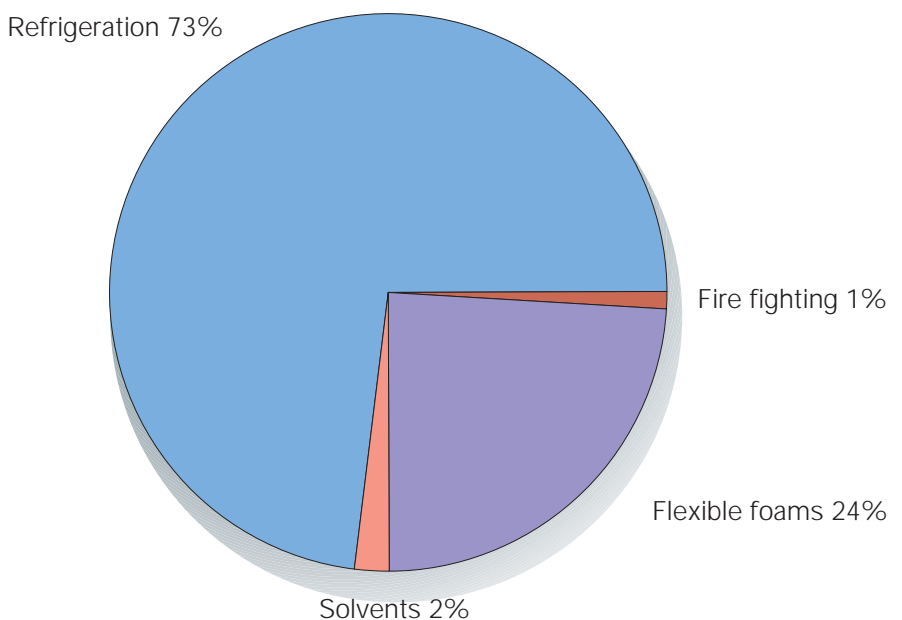
The phase-out strategy sought to:

- ▶ achieve the most significant ODS reductions by targeting the largest consumption sectors first (refrigeration and foam);
- ▶ minimize the costs to Ghanaian industries and consumers.

Within both sectors, appropriate phaseout strategies had to be defined, combining institutional strengthening, regulatory measures, training and awareness programmes with other support measures.

Ghana's total ODS consumption in 1991 by sector.

Source: Country Programme



BUILDING A STRONG FOUNDATION THROUGH POLICY DEVELOPMENT AND RAISING AWARENESS

In 1993, Ghana established its National Ozone Unit (NOU) at the Environmental Protection Agency with the assistance of UNDP. As the Government office that is responsible for the monitoring and ensuring the implementation of the Country Programme, the NOU recognized that without the proper policy framework in place, the planned investment and non-investment projects might not succeed. Accordingly, it initiated an aggressive programme to create the regulatory framework to reinforce the investment, training and other ODS phase out measures. Of particular note was the establishment of an import regulatory mechanism for all chemicals, including ODS.

At the same time as it was drafting and adopting these policies, the NOU undertook a comprehensive public awareness campaign to ensure that both the public at large and the companies responsible for actually phasing out the

ODS understand and support the policies to protect the ozone layer. The campaign raised the awareness of:

- ▶ 2,500 members of the key industry association, National Air Conditioning and Refrigeration Workshops Owner's Association (NARWOA), on ozone depletion in general and good practices in refrigeration in particular;
- ▶ 1,315 students and instructors from second and third cycle educational institutions in five regions of the country; and
- ▶ 35 representatives of the media.

At all stages of the implementation of Ghana's ODS phase out programme, but especially during those related to awareness-raising, the NOU has closely involved non-governmental organizations such as the national chapter of Friends of the Earth.

With the public and industry supporting the national strategy to protect the ozone layer, and conducive policies in place to reinforce the ODS phase-out projects, the NOU could now extend assistance to the priority industries.

Reducing CFC emissions through training at the Accra Technical Training Centre.



A NON-INVESTMENT APPROACH TO REDUCE REFRIGERANT CONSUMPTION: STRENGTHENING LOCAL EXPERTISE

The servicing of refrigeration equipment accounted for the majority of this sector's consumption. Since servicing is a labor-intensive business involving relatively little equipment, the reduction of ODS in this context requires the introduction of new skills and techniques, not large investments. Accordingly, the NOU focused on training workshop managers and service technicians to:

- ▶ minimize unnecessary ODS emissions during servicing and maintenance of refrigeration equipment through good servicing practices, including recovery and recycling
- ▶ recover and recycle ODS for continued use in existing ODS equipment to avoid pre-mature decommissioning because of lack of refrigerant.

In cooperation with UNEP IE's OzonAction Programme and UNDP, the NOU designed and implemented three projects along these lines:

- ▶ a train-the-trainer programme and training for servicing technicians in October 1993
- ▶ a complementary programme between October 1993 and December 1996 for improved servicing and maintenance, which included the establishment of a recovery and recycling scheme.
- ▶ establishment of a national refrigeration demonstration centre in September 1994

All projects were closely coordinated with each other, and both involved the participation of the key industry association (NARWOA) and the training institute

(Accra Technical Training Center).

Key elements of the above projects were:

- ▶ Total participation and strengthening of local expertise,
- ▶ Implementation of a nation-wide awareness programme for the refrigeration sector, and targeting refrigeration professionals, instructor of 2nd and 3rd cycle institutions as well as students and the general public.
- ▶ Establishment of a certification scheme for refrigeration technicians. The certification scheme is part of the legislation which is currently under consideration. When promulgated, only workshops with at least one trained technician will be allowed to operate.
- ▶ Adaption of UNEP's "Training Manual on Good Practices in Refrigeration" to local conditions to be used as resource document during the training workshops.
- ▶ Implementation of workshops in which 1750 refrigeration workshop managers, heads of technical institutions and technical trainers were trained and certified in conformity with above certification scheme.
- ▶ Monitoring of common servicing, recycling and purchasing practices of refrigeration workshops by the National Ozone Unit and the National Committee on Improved Refrigeration Practices.
- ▶ Establishment of a recovery and recycling scheme for refrigerants and the corresponding monitoring scheme. The legal status of the recovery and recycling scheme is currently under consideration.
- ▶ Establishment of subsidy for the purchase of recovery and recycling equipment. Up to date, 21 recovery and recycling machines plus accessories, 120 leak

detectors, 45 heat guns, 654 piecing valves, 20 manifold gauges and accessories were purchased through UNDP.

- ▶ Establishment of a National Refrigeration Demonstration Center (NRDC) which is managed by the National Ozone Unit and a refrigeration engineer of the center. NRDC demonstrates good practices in refrigeration as described in the UNEP Training Manual on Good Practices in Refrigeration, including recovery and recycling practices and refrigeration workshop management to about 50 visitors per month.

As a direct result of these two projects, Ghana achieved:

- ▶ Net reduction of 45.8 tonnes of CFC-12 consumed annually
- ▶ Approximately 1.0 tonnes of CFC-12 and HCFC-22 are recovered and recycled per year.

A TECHNOLOGY SOLUTION FOR THE FOAM SECTOR

The phaseout plan for the foam sector focused on the conversion of foam manufacturing companies through technical assistance and technology transfer. With the assistance of UNDP, the NOU identified, designed, and implemented two projects:

- ▶ Technical assistance for the transfer of methylene chloride technology to phase-out CFC-11 in flexible foam manufacturing (1994)
- ▶ Conversion to CFC-free technology at the Ashanti, Latex and Nsawana foam factories. (1996)

As a direct result of these two projects, Ghana has phased out 24 tonnes of CFC-11. The second part of the project, which is

still on-going, will improve worker safety during the foam manufacturing process.

THE BALANCE SHEET AFTER FIVE YEARS

The net balance after almost five years of implementation of the Country Programme is a total ODS consumption of 15.8 ODP tonnes for the year 1996, representing a reduction of almost 85% with respect to the consumption in the year 1991.

In absolute terms, the consumption of CFC-11 was reduced by 36 metric tonnes and of CFC-12 by 45.8 metric tonnes. The remaining consumption is attributed to the domestic refrigerator, mobile air-conditioning and chiller sectors.

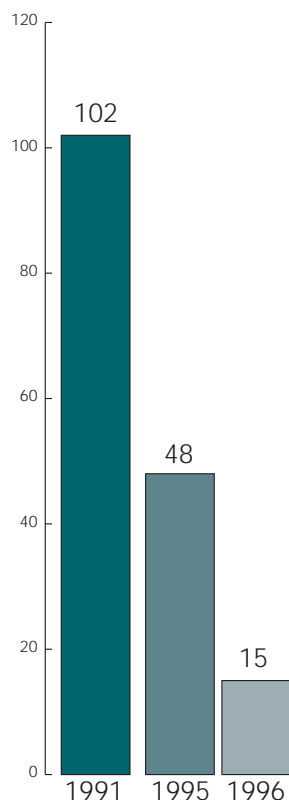
In the case of CFC-11, the reduction is due to a combination of direct investment projects that have replaced CFC-11 in the foam manufacturing process, and a high degree of awareness about the ozone protection issue, which has resulted in no new commercial equipment containing CFC-11 being installed.

For CFC-12, the reduction is attributed to a number of reasons:

- ▶ Training in good practices: some people have estimated that up to 40 tonnes of CFC-12 which were used in wasteful charging and cleaning practices before the training project was implemented. This CFC use has now been eliminated.
- ▶ Regulations: the import permit system already established has created the expectation of a future ban.
- ▶ Recovery and recycling: these have been directly responsible for a significant reduction within the industrial and commercial sector.
- ▶ Heightened awareness of the need to protect the ozone layer: awareness programmes have influenced maintenance and servicing practices,

Reduction in Ghana's (ODP tonnes)

Source: Country Programme, Article 7 data reporting



procurement decisions and proper handling and use of refrigerants and refrigeration appliances.

LOOKING BACK: KEYS TO SUCCESS

Ghana attributes its success in achieving an early ODS phase out to a group of factors, many of which could be considered by other developing countries when confronting similar challenges:

- ▶ Identifying the priority sectors for phase-out early.
- ▶ Involving the key stakeholders early in the phase-out process at both the planning and implementing level.
- ▶ Sending clear messages from the government to various stakeholders by the establishment of appropriate regulations and policies.
- ▶ Conducting an aggressive programme for raising awareness of key selected target audiences.
- ▶ Choosing wisely a project portfolio with the right mix of investment and non-investment projects.
- ▶ Recognizing early the importance of building local capacity through training.
- ▶ Increasing the capacity of the NOU by its active involvement in the Regional Network of ODS Officers and other international fora.

THE ROAD AHEAD: THE REMAINING CHALLENGES

Ghana is aware of the challenges ahead: maintaining momentum and exceeding the present achievements will require a sustained effort from all stakeholders. A shift in the nature of the activities will also be needed to reflect the country's evolving needs. Some priority challenges that are yet to be addressed include:

- ▶ Illegal imports of CFCs are possibly entering the country.
- ▶ Inflow of old ODS-using equipment may negate the country's early ODS phase out achievements.
- ▶ Ozone depletion issues and its relation to refrigeration practices is still not included as a standard element of the curricula of all technical training institutes in the country.
- ▶ Servicing workshops complain that replacement refrigerants as well as required tools for good servicing and maintenance practices are still very expensive.
- ▶ NRDC needs more tools and technical reference literature.

In response to these and other issues, and in order to sustain the country's early successes, the NOU is planning to undertake the following measures in the near future:

- ▶ Maintain public support for Ghana's Country Programme by continuing awareness raising activities for various segments of society.
- ▶ Control ODS imports by establishing taxes on the importation of ODSs and ODS-containing equipment.
- ▶ Promote the adoption of alternative technologies by establishing a tax exemption for CFC-free technology.
- ▶ Encourage the dissemination of good refrigeration practices by shifting the focus of the NRDC from training to monitoring of recovery and recycling scheme and code of good refrigeration practices.
- ▶ Tackle the next major technical projects by retrofitting selected CFC-containing chillers, and investigating the feasibility of retrofitting domestic refrigerators to use hydrocarbons.

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