



United Nations  
Environment  
Programme



Distr.  
GENERAL



UNEP/OzL.Pro/WG.1/6/4  
27 January 1992

ORIGINAL: ENGLISH

OPEN-ENDED WORKING GROUP OF THE  
PARTIES TO THE MONTREAL PROTOCOL

Sixth meeting  
Nairobi, 6-15 April 1992

NOTE BY THE EXECUTIVE DIRECTOR

1. Decision III/II of the Third Meeting of the Parties to the Montreal Protocol, held at Nairobi from 19-21 June 1991, stated, inter alia, that "should the results obtained by the Assessment Panels suggest the need to adjust or amend the Protocol, the Working Group would make recommendations in time for consideration by the next meeting of the Parties".
2. The Assessment Panels have completed their work and a synthesis of their reports, prepared by the co-chairs of the panels, has been distributed to all the Governments and to the United Nations and other relevant organizations. The Executive Director has discussed the reports and the conclusions of the Assessments with the co-chairs of the panels. He recommends that the Working Group take into account the following:
  - A. The State of the ozone layer
3. Since the 1989 Assessment, scientists have discovered that the stratospheric ozone layer is being depleted at an even greater rate than predicted. Depletion of the ozone layer is now observed at high- and mid-latitudes in both hemispheres during all seasons. For example, in the summer at 45 degrees North latitude, 3 per cent of the ozone shield was lost during the 1980s. In addition, the most severe Antarctic ozone holes have now been observed for the past four out of five years, which contrasts with the earlier situation during which relatively severe ozone holes had been observed only every other year. Furthermore, studies in the Antarctic and Australia have confirmed that significant increases in surface ultraviolet-B (UV-B) radiation can occur as a result of these ozone losses.
4. Even with world-wide implementation of the Montreal Protocol and its London Amendment, the stratospheric ozone layer will deteriorate further. If the Protocol is not strengthened, the abundance of ozone-depleting chemicals in the stratosphere will increase by about 20 per cent during the 1990s. The additional ozone losses will be comparable to those of the 1980s. Indeed, even with full compliance with the London Amendment, ozone losses over the mid-latitudes of both North and South will reach 6 per cent in summer and 10 per cent in winter by the year 2000. The abundance of ozone-depleting

chemicals will be larger than any that the planet has ever experienced, with the risk that incompletely understood processes, such as those occurring on the surfaces of particles, will cause even higher ozone losses in the near future.

5. Methyl bromide has been identified as a significant ozone depleting substance. Any reduction in its emissions would have substantial benefits for the ozone layer. The sources, production, and alternatives have not yet, however, been fully evaluated.

6. Brominated halon substitutes (HBFCs) could also cause significant ozone depletion unless the quantity and duration of their use is limited, as should be the case for HCFC transitional substances.

7. A substantial improvement in this deteriorating situation would require actions above and beyond the London Adjustments and Amendment:

- An acceleration of the phase-out of all controlled substances;
- A limitation on the use of transitional substances; and
- Further additions to the list of chemicals now controlled.

8. Such tighter controls could substantially reduce the increase in the abundance of stratospheric ozone-depleting substances during the next decade. Furthermore, the return toward natural ozone levels would be advanced by 10-15 years, bringing forward in time the elimination of the adverse impacts of ozone layer depletion on human health and the health of the environment and the planet's natural resources.

B. Technology and economics of ozone layer protection

9. The reduction in consumption of CFCs to date is faster than that required by the Protocol. By November 1991, the world had already halted 40 per cent of its use of CFCs and should have eliminated at least 50 per cent of CFC use by November 1992 when the Parties meet in Copenhagen. This progress has been more rapid than that predicted in the 1989 Assessment. Moreover, developing countries have made considerable progress in reducing CFC use, particularly in aerosol products, foams, and solvent uses. Singapore has reported a 60 per cent reduction of CFC use since 1986 - the highest reduction of any country in the world. Mexico and China have announced goals of eliminating controlled substances on the same schedule as that of the developed countries if adequate financing and technology are available.

10. The phase-out is less expensive than predicted and frequently results in cost savings. While it is not yet possible to estimate accurately the final cost of a phase-out, there is strong evidence from those countries and companies that have been most aggressive in implementing new technology. The first two companies to halt completely their use of CFC-113 in electronics manufacturing have already recovered their investment and continue to save money. In 1988, the United States Environmental Protection Agency (EPA) estimated that a 50 per cent reduction in CFC use would cost the United States fifteen billion dollars by 2075. Just two years later, the costs had declined as a result of new technologies and the EPA estimated that complete phase-out would cost less than fifteen billion dollars. This cost reduction trend is expected to continue. The Assessment reports indicate cost savings from

/...

switching from CFCs to hydrocarbons in aerosol products, as well as savings from reducing and eliminating CFCs in cushioning and packaging foams. CFC recycling from automobile air conditioners, commercial refrigeration, and fixed air conditioning systems either results in savings or costs very little. Recycling and conservation investments increase employment in these service sectors.

11. Earlier phase-outs in developing countries can cost less. There are substantial economic advantages from early phase-out in developing countries. Many investments in alternatives will be immediately profitable, where they lead to lower costs as indicated above. In other applications, such as air conditioning and commercial refrigeration, prompt investment in alternatives minimizes the production of equipment that uses CFCs during the coming years; this in turn, will minimize the cost of eventual retrofit or early scrapping of machinery. Also the early adoption of the latest technology assists in preserving or gaining access to world markets.

12. Technologies to eliminate controlled substances are available for virtually every application of the controlled substances. HCFC and HFC substitutes are produced in several countries by competing companies and production capacity is quickly expanding to achieve economies of scale. Alternate technology is already available at competitive prices: solvent substitutes (conservation of substances; clean manufacturing; and aqueous, semi-aqueous and hydrocarbon solvents); foam-blowing alternatives (carbon dioxide, low CFCs and other processes); aerosol products (hydrocarbons, compressed air, pumps, sprays, sticks); and recycling (CFC and halon). Many of the best technologies are in the public domain and the equipment can be manufactured locally (such as recycling and distillation equipment; low-solids flux; aqueous and semi-aqueous cleaning machines; carbon dioxide, foam, and powder fire extinguishing agents; HFC-152a and HCFC-22).

13. Accelerated CFC phase-outs require that HCFCs and HFCs are safe to use, environmental acceptability acceptable, and commercially available in adequate quantities. For refrigeration and air conditioning, retrofit technology must be further developed in order to avoid excessive costs from the abandonment of equipment dependent on CFCs. Accelerated halon phase-outs depends on the management of recycled halons from existing stocks. An accelerated 1,1,1-trichloroethane phase-out depends on world-wide technical cooperation of industry and the rapid dissemination and adoption of replacement technologies among thousands of small users.

C. Recommended adjustments and amendments

14. The following Adjustments to the Protocol are both environmentally necessary and technologically, economically and administratively feasible.

Production and consumption of the controlled substances listed in Annex A should be cut by 85 per cent of 1986 levels by either 1 January 1994 or 1 January 1995, and phased out by 1 January 1996.

Production and consumption of controlled substances listed in Annex B should be cut by 85 per cent of 1989 levels by either 1 January 1994 or 1 January 1995, and phased out by 1 January 1996.

/...

15. For all substances, there should be provision for temporary exemptions for any essential uses after the 1 January 1996 phase-out date. A list of essential uses, if any, should be adopted by decision of the Parties at their meeting in 1994 following an Assessment during 1993.

16. It may be possible to eliminate halons earlier than 1 January 1996, if mechanisms are put into place for the preservation, management and allocation of halons stored in existing equipment. The Parties should consider setting up such mechanisms in order to accelerate the halon phase-out further.

17. In addition to the above adjustment, the following changes are also necessary for protection of the ozone layer. They are technically and economically feasible, but can be introduced only by amending the Protocol as follows:

- Restricting the annual level of HCFC emissions by:
  - Banning their use in non-essential applications;
  - Limiting Parties to specified levels of HCFC production and consumption; or
  - A combination of these controls that would ban non-essential uses and place a firm ceiling on the total emissions into the atmosphere;
- Halting the use of HCFCs in new equipment by 2010, except for any essential uses to be specified by the Parties;
- Allowing production of HCFCs to continue only until 2025 for the servicing of existing equipment;
- Including HBFCs under the HCFC regime;
- Phasing out methyl bromide by 2010, subject to review;
- Reducing the 10-year grace period for Article 5 Parties to five years.

18. The control of HCFC and HBFC transitional substances is more complicated than that for the currently controlled substances because it is necessary first to encourage the use of HCFCs and HBFCs in place of controlled substances before phasing them out. Therefore, in the elaboration of controls, due regard should be given to the Ozone Depletion Potential (ODP) of the different transitional substances.

D. Environmental benefits of the recommended amendments and adjustments

19. The recommended control measures will result in substantial health and environmental benefits. A 1996 phase-out of controlled substances will accelerate the recovery of the ozone layer by 10-15 years, preventing 4.5 million additional cases of skin cancer and 350,000 cases of blindness (based on an exposure to the increased UV-B radiation resulting from a 10 per cent depletion in stratospheric ozone that has been lessened by 15 years).

/...

20. Other benefits of more stringent regulation are possibly of even greater consequence than the cancer and blindness effects, but more difficult to quantify. One such benefit is limiting the influence of increased UV-B radiation on the immune system. Increased UV-B radiation could lead to an increase in the incidence and severity of infectious diseases and is expected to render immunization programmes less effective.

21. Another benefit would be preserving the world's food supply from oceans and terrestrial plants. For example, increased UV-B radiation can reduce phytoplankton biomass, as well as change the composition and diversity of species. This may reduce marine food production at the bottom of the food chain and consequently the food supply to fish and mammals higher on the food chain.

22. The adverse impacts of increased UV-B radiation may be even greater where terrestrial and aquatic ecosystems are already stressed by heavy metals, pesticide and fertilizer residue, and other soil and air pollution. A reduction in the rate of ozone depletion by an accelerated phase-out would reduce these risks considerably.

E. Implications for the Multilateral Fund

23. The accelerated phase-out by developing countries requires effective operation of the Multilateral Fund and efficient cooperation between the implementing agencies (UNDP, UNEP and the World Bank). The Parties must provide the financial resources necessary for meeting the incremental costs of Article 5 countries under this accelerated schedule. The 1989 and 1991 Assessment Reports have not estimated total costs for the phase-out of controlled substances in developing countries. This is due partly to differences in the circumstances of a variety of developing countries and the companies operating within their territories, but largely because estimates of cost are continually falling as the replacement technologies are further developed. In setting new levels of contributions to the Fund, the Parties need to assess this cost trend, together with the need to accelerate the elimination of controlled substances, and the emerging experience of the Executive Committee. Contributions should be set on a rolling three-year basis, as the total financial requirements for phase-out continue to change. The dissemination of information is particularly important for the early transfer and adoption of replacement technologies.

-----