

Protection of the Ozone Layer: Towards a Protocol on Chlorofluorocarbons*

Urgent action is necessary to prevent destruction of the atmosphere's protective ozone shield. By continuing to release certain chemicals into the air, our modern societies are conducting a global-scale experiment which could result in irreparable harm to human, plant, and animal, life and change the Earth's climate. Moreover, we are conducting the experiment without fully understanding the consequences. Now we have to set in motion the governmental actions that will prevent harmful, large and irreversible changes to the stratospheric ozone layer and protect life on Earth from these potential dangers.

The Vienna Convention provided the international community with a framework for working together to protect the stratospheric ozone layer. Opening the Vienna Conference in 1985, UNEP's Executive Director, Dr Mostafa K. Tolba, called it 'the first global convention to address an issue that for the time being seems far in the future and is of unknown proportions... We act now for the future... To experiment with the make-up of our atmosphere is to experiment with the health of all humans and the welfare of all organisms upon which we depend for survival.'

With the Convention we accepted the obligation to take appropriate measures to protect human health and the environment against harmful effects of human activities which could modify the ozone layer. It gave us the mandate for the international cooperation needed to address this major atmospheric concern.

Early Efforts to Protect the Ozone Layer

Even before the Convention was completed, it was recognized that the potential dangers to the ozone layer from Man-made chemical releases would require emission controls. Adverse consequences can flow from the smallest depletion. A single percentage-point loss of ozone can induce a six per cent increase in certain types of disfiguring skin-cancer. Yet projections of ozone depletion related to zero growth of chlorofluorocarbon (CFC) emissions approach five per cent, and with only moderate growth double-figure depletions are projected.

For reasons of protection a number of governments had already introduced control measures, and the drafters of the Convention initiated a vigorous effort to prepare a protocol to control CFCs which it had been hoped could be signed with the Convention. For several reasons—failure to agree on the science, disagreement over control strategies, inability to accommodate differing viewpoints—the attempt to achieve the protocol did not succeed at that time.

A Creative Re-examination

We then—I believe wisely—stepped back from that experience and made a creative decision. Recognizing that our factual base needed strengthening—that issues were complex and our perceptions at variance—we decided to join together to explore those and other considerations in a series of collaborative international studies and workshops. Our expectation was that, through exchanging information and views, we would have a better chance to see solutions clearly and reach agreement on the ozone issue. This was a novel and constructive approach, and one that commends itself for our use in addressing other complicated international environmental issues in the future.

The breadth and depth of our investigations over the past year are not only impressive in the process and the information provided, but also a testimony to the energy and dedication with which everyone has approached the task. The international scientific assessment of stratospheric ozone sponsored by NASA, WMO, and others within the CCOL†, provided more refined data on the atmosphere than had ever before been presented. It confirmed the risks of significant ozone depletion if chlorine-containing chemicals, particularly chlorofluorocarbons, should be emitted to the atmosphere at a higher rate than at present. It also stressed the possibility of climatic change occurring as a result of increasing levels of tropospheric ozone, as well as of the 'greenhouse gas' properties of ozone-modifying substances.

The Rome Workshop in May 1986 on the economic aspects (sponsored by the Italian Government and the Commission of the European Communities), the June Conference on Health and Environmental Effects of Ozone Modification and Climate Change (co-sponsored by UNEP and the US Environmental Protection

* Following the Author's opening statement at the 'First Session of the Ad Hoc Working Group of Legal and Technical Experts for the Preparation of the Protocol on Chlorofluorocarbons to the Vienna Convention for the Protection of the Ozone Layer (Vienna Group)', see also the report by Dr Joseph P. Glas in the Conferences & Meetings section of our next issue.—Ed.

† CCOL = Coordinating Committee on the Ozone Layer.—Ed.

Agency), and the Leesburg, Virginia, Workshop on Control Strategies, have laid solid groundwork for the development of a chlorofluorocarbon protocol. But the Rome Workshop heightened our awareness of another problem: while earlier steps taken by some governments to stop certain non-essential CFC uses had cut their emissions temporarily, other uses were on the increase, so that global production was mounting (the Chemical Manufacturers' Association estimated production increases of 7% for the two years 1983 and 1984). The progress made at those meetings was significant, and it is with a sense of urgency that we now have to translate that work from the experts' to the diplomats' arena.

Greenhouse Effect and the 'Ozone Holes'

At the same time, events outside the workshop framework added increased urgency to the ozone question. In October 1985, UNEP/ICSU/WMO carried out a second assessment of the greenhouse gas/climate change issue at Villach, in Austria, which concluded that the effects of trace-gases are no longer confined to ozone depletion, but that they are calculated to have an impact of climatic warming at least in the same direction as CO₂.*

In addition, although it could not be definitely attributable to the changing chemistry of the atmosphere, the renewed concern about the enormous 'hole' in the ozone layer over the Antarctic, and later the first-time observation of stratospheric ozone depletion over northern Europe, has given occasion for sober pause. Indeed, one of the heartening developments in recent months has been industry's public expression of concern about potential harmful CFC effects on the atmosphere† and request that governments provide guidance to its members about the future of their products.

New Momentum for Protecting the Ozone Shield

Those events during the past year-and-a-half have stepped up the urgency to implement the May 1985 UNEP Governing Council request (to the Executive Director [in decision 13/17 I.5]) to convene a working group to continue deliberations towards a protocol addressing strategies for control of chlorofluorocarbons, and now the momentum is clearly building up for such a protocol. Shakespeare wrote in *Julius Caesar* that: 'There is a tide in the affairs of men which, taken at the flood, leads on to fortune.' The evidence suggests, I believe, that such a tide is rising for the community of nations to take early steps to protect the ozone layer.

As the Chairman at the Leesburg, Virginia, Workshop on Control Strategies, observed, we are coming to some broad areas of agreement: the ozone layer is essential to human habitability of the planet, it is being and will continue to be destroyed by chlorine-containing chemicals (particularly chlorofluorocarbons) which will allow increased amounts of harmful radiation to reach the Earth. The risks involved will affect all countries, and they are serious enough to warrant taking control measures.

Because of the nature of the ozone problem and the controls required, those measures will necessitate global cooperation. To be accepted and effective the controls will have to be fair, economically manageable, easy to monitor and administer, and adaptable to changing conditions.

Overcoming the Obstacles

The rising tide for ozone protection does not cover all of the 'rocks and shoals' we will face along the way. Navigating the channel to a protocol may be obstructed by lack of scientific certainty, or by failure to reach consensus on how much ozone depletion is tolerable. We could become stranded when searching for the level of the combined emissions that cause depletion, or 'run aground' on the conflicting national, commercial, or individual, interests which will be seeking protection.

We can overcome those obstacles if we acknowledge the real danger of ozone depletion and act together while we still have a chance to keep the damage small. Because we are reaching out for solution of a long-term problem, policymakers will have to exercise judgement in a leap of faith, before all the science is available—protecting the common good and as far as possible the affected interests. That is the nature of decision-making in the face of uncertainty; and because the effects of ozone depletion remain latent for long periods of time, a degree of uncertainty will persist in this field. But with the risks involved, uncertainty is no rationale for inaction.

* See further the note on page 364 of this issue, entitled 'Links Between Ozone Depletion and the Greenhouse Effect', Dr Thomas D. Potter's account of the 'Advisory Group on Greenhouse Gases...' published on page 365, and Jack Renerie's short communication entitled 'United States' National Ozone Expedition Statement' published on pp. 353–5.—Ed.

† A notable example of this is the statement of the Director of DuPont's Freon Products Division published on pp. 363–4 of this issue.—Ed.

At the same time we will have to continue to understand better than currently the impact of human activity on the atmosphere, by working to eliminate the uncertainties and tailoring our controls to fit the realities. UNEP will ensure through the CCOL that the scientific review and assessment process will be a continuing one—so that, should science so dictate, a prompt response can be determined and the protocol duly revised. With good faith, willingness to cooperate and accommodate, and some statesmanship, the ozone protocol can be achieved—in the spirit of the very recent signing in New Caledonia by 16 diverse metropolitan and small-island states, split earlier by serious political differences, of an agreement on protecting the natural resources and environment of the South Pacific.

The Road Ahead

After more than a year of re-examination, the task of achieving this much-needed protocol cries out in importance but is fraught with difficulty. In the simplest terms we have to decide on those measures which Mankind can take now to preserve the basic characteristics of the atmosphere that comprises so much of the fundamental life-support system of our planet—by acting to prevent large and irreversible changes to the stratospheric ozone layer. This is no minor task but one of the most momentous imaginable, our goal being the adoption of a fully safeguarding protocol. It can and must be accomplished in the months ahead because of the sense of concern which we all share about the safety of the fragile ozone shield. So let us concentrate on the task at hand and proceed with a common design to arrive at a protocol with the least delay possible.

In 1962, the late President Kennedy of the United States paid a state visit to Canada during which he and the then Prime Minister, John Diefenbaker, undertook a small environmental task—a tree-planting ceremony—during which the President strained his back. Learning of the injury later, the Prime Minister sent a sympathetic letter to the President, who replied: 'Dear Mr Prime Minister: Thank you for your thoughtful letter. The tree will be there long after the discomfort is gone.' As we begin the important task before us, we know that the results of our work will be there to benefit Mankind long after the burden of effect is forgotten. Let us accordingly do all we can to ensure that The Biosphere's ozone shield remains intact to protect life on Earth.

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NOTICE

1974-86 Cumulative Index of Titles and Authors in *Environmental Conservation*

Following our preliminary notice of the above, on page 194 of our latest issue, we have had encouraging correspondence, donations, and even incipient orders, but not yet enough to go ahead with full confidence with what we are assured would be a very worthy and helpful project of publication. A few more donations to back indications of need, and/or sale of complete sets of the 13 volumes of the Journal published to date, would secure our positive decision on the matter of printing forthwith, as the Index is now complete and being revised and edited for full conformity.

We are further assured that such a publication would indeed document very 'much of the evolution of the environmental movement during its most vital, formative period', as well as much of the world's conservational thrust, and that we should be able to keep the price down to 30 Swiss Francs or 20 US dollars (inclusive of postage) which we would certainly hope (though not yet guarantee) to do.

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