REPORT ON THE MEETING OF THE OPEN-ENDED WORKING GROUP TO DEVELOP MODALITIES FOR FUNDING MECHANISM TO ENABLE DEVELOPING COUNTRIES TO COMPLY WITH THE MONTREAL PROTOCO

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(UNEP HEADQUARTERS, NAIROBI - AUGUST 21-25 1989)

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SEPTEMBER 4, 1989

REPORT ON THE MEETING OF THE OPEN-ENDED WORKING GROUP TO DEVELOP MODALITIES FOR FUNDING MECHANISM TO ENABLE DEVELOPING COUNTRIES TO COMPLY WITH THE MONTREAL PROTOCOL (UNEP HEADQUARTERS, NAIROBI - AUGUST 21-25 1989)

INTRODUCTION

The Open-ended Working Group on Funding Mechanism held its first meeting at the United Nations Environment Program (UNEP) headquarters in Nairobi from August 21 to August 25, 1989. The meeting was attended by delegations from 20 contracting parties to the Montreal Protocol. In addition, delegations from ten non-contracting parties including Malaysia also attended the meeting.

[See Attachment I]

2. The Working Group on Funding Mechanism was established by the Parties to the Montreal Protocol at its first meeting in Helsinki early this year (May 2-5 1989) whereby it was decided that the Working Group would develop modalities for an international financial and other mechanisms (including an international fund) to facilitate contracting developing countries to comply with the provisions of the Montreal Protocol.

[See Attachment II - Report of the Informal Group of Experts on Financial Mechanism]

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3. UNEP has been entrusted to organize the meeting. Although Malaysia has yet to ratify the Protocol, UNEP invited the Government to send its representative in accordance with provisions of the Protocol which encouraged non-parties to attend meetings of the Parties.

BACKGROUND

4. Over the past decade, the Earth is faced with the problem of depletion of ozone layer. As early as 1974, it was discovered that synthetic chemicals such as the chlorofluorocarbons [CFCs] are destroying the ozone. CFCs, which was first discovered in 1936 as refrigerants, are man-made chemicals. Over the years, CFCs have been used for many purposes such as blowing agents in plastic foam products, propellants in aerosol spray cans and solvents to clean microchips and other electronic equipment.

5. Although CFCs are non-toxic and non-flammable chemical substances, evidently, they are not considered environmentally safe once they are released in the upper atmosphere and in the stratosphere. Here, they damage the ozone layer thus permitting the more harmful ultravoilet radiation to reach the Earth. The consequences of this systemic interaction would result in increase in health hazards notably skin cancer, eye cataract and impairment of natural immunity systems as well as climatic and other environmental effects. Thus, if further emissions of CFCs are allowed to continue, a truly global and devastating environmental damage would occur in future.

6. In order to manage the problem of depletion of the ozone layer, the international community adopted the 1985 Vienna Convention for the Protection of the Ozone Layer and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.

7. The Montreal Protocol (1987 Protocol) has now been signed by 46 countries; of which 39 are Parties. Only 10 of the 124 or more developing countries have ratified the Protocol. Major producers, importers and users of CFCs in the developing world such as Brazil, China, India, Korea and Malaysia have yet to ratify the Protocol.

[Note: According to the Ministry of Foreign Affairs, our Instrument of Accession has been submitted to the UN Headquarters in New York and thus ratification of the Protocol by Malaysia is expected in the near future]

8. The 1987 Protocol makes it mandatory for the Contracting Parties to take several control measures to prevent depletion of ozone layer. To most contracting developing countries, implementation of these measures would require financial resources to meet the cost of compliance. These costs would include:-

(a) cost of acquiring new technology (from the developed world) to shift away from CFC production (applicable to CFC producers);

MATTERS DISCUSSED AT THE MEETING -

10. The substantive discussions were organized according to the following topics:-

(i) General debate;

(ii) Definition of types of technology transfer;

(iii) Overall cost of technology transfer needed by the developing countries;

(iv) Beneficiaries of the resources to be made available;

(v) Sources of financing; and

(vi) Financial mechanism and other modalities.

(i) General Debate

11. Several delegations from both developed and developing countries took part in the general debate. In summary, the following issues were highlighted:-

(a) Insufficient data and information are currently available to determine the magnitude of the cost of assistance and to decide on specific mechanism. Thus country specific studies to examine the options and cost of reducing CFC use in developing countries were proposed;

(b) Carrying out of such studies should not delay the development of financial mechanisms; and

(c) Use of existing bilateral and multilateral institutions should be examined. Some delegations were supportive of an International Environmental facility (a clearing-house mechanism) while other delegations especially from the developing countries strongly advocated the setting up of a Trust Fund to be located at UNEP or any other suitable organization with legally enforceable obligations of contributions by the developed countries.

(ii) Definition of types of technology transfer

12. Based on the Report by the Drafting Committee, the Meeting agreed that, in the context of international financial mechanism, transfer of technology means facilitating access to environmentally safe alternative substances and technologies for Parties that are developing countries and assist them to make expeditious use of such alternatives by meeting the incremental cost or free transfer of technology associated with the transition.

13. Incremental costs that might be covered by the financial mechanism would include:-

Production of CFC

(a) Cost of conversion of existing production facilities;

(b) Cost of scrapping existing plants;

(c) Cost of establishing new production facilities for substitues of capacity equivalent to the scrapped plant; and

(d) Cost due to facilities rendered idle so as to comply with the 1987 Protocol.

CFC used as an intermediate good

(a) Cost of conversion of existing equipment manufacturing facilities including cost of patents and designs and incremental cost of royalties; and

(b) Cost of modifications or replacement of user equipment if required by the 1987 Protocol.

Consumers of CFC products

(a) Training cost and cost for providing technical assistance to reduce consumption and unintended emission of ozone depleting substances.

[See Attachment IV]

(iii) Total Cost

14. The available estimates of the conversion cost could not be confirmed due to the absence of details on methodologies used. The meeting felt that the country specific studies would be helpful inorder to assess the accurate estimates of the total costs. The national studies should be carried out on the basis of common methodologies and formats in a number of developing countries representing different categories of CFC producers, product manufacturers and product importers. Carrying out of the studies and the establishment of a funding mechanism should be concurrently implemented.

15. Representatives of some industrialized countries indicated that they would be in a position of finance the country studies if requested by the respective Governments.

16. It was recommended that such national studies should be initiated immediately by each developing country concerned and available information should be provided to the next meeting of the Working Group and also to the next meeting of the Parties in June 1990.

[See Attachment V]

(iv) Beneficiaries

17. The meeting agreed that financial and other support should only be provided to developing countries who are parties of the 1987 Protocol.

18. The meeting also agreed that such support should be channelled through the Governments of the recipient countries since the respective Governments would ultimately be responsible for ensuring compliance with the Protocol.

19. The meeting recognized that financial and other support would be used for two main purposes: Firstly, compensation for the incremental costs of transition to non-ozone depleting substitutes. Secondly, the support would serve as as incentive to ensure adherence to the Protocol.

(v) Sources of Financing

20. The meeting agreed on a number of points concerning sources of financing which are as follows:-

(a) The main sources of funds should be official Government sources from developed countries;

(b) Flow of funds should be on concessionary basis. Some delegations especially from developing countries advocated for the funds to be provided on grant basis;

(c) Private sources of financing would be provided on commercial, non-concessionary terms. While this private funding might play a useful role, it would not be part of the funding mechanism to be decided by the Working Group; and

(d) International tax on use of CFCs, as a source of financing, should remain an option which would be examined further. The meeting recognized that this could be a viable source to the individual developed countries to raise funds for the developing countries.

(vi) Financial mechanisms

21. Discussion on the financial mechanisms generated a lengthy debate among the delegates. At the end of the meeting, the Working Group managed to have a consensus view on the following:-

(a) A Trust Fund or another effective mechanism should be created in conjunction with the Protocol Secretariat to which countries who are Parties to the 1987 Protocol could pledge contributions (financial or otherwise);

(b) With the aim of determining the specific charateristic of financial mechanism, it would be useful to carry out national studies on technology options and cost to the economies of developing countries. Such studies should not delay the creation of an effective financial mechanism; and

(c) Another study should be commissioned which, among other things, would examine:-

(i) the role that either a new or an existing institution might play in meeting the objectives of the Protocol;

(ii) the functional requirements of administering assistance to the developing countries;

(iii) the options for an international financial mechanism including the options of a specific new fund, an international environmental fund and a Trust Fund;

(iv) the potential of using existing institutions separately or in combination including UNDP, UNEP, UNIDO, the World Bank and other relevant institutions.

This study should be presented to the Working Group and should be taken into account by the Group in formulating concrete recommendations on an effective financial mechanism.

MALAYSIA'S STAND ON THE FUNDING MECHANISM

22. During the Plenary session, Malaysia's views on the funding mechanism including the institutional arrangement were put forward and these could be summarized as follows:-

(a) Concept of a Trust Fund merits consideration of the Working Group as this represents the most straight forward mechanism as compared to others such as the International Environment Facility, Ecovest and World Environmental Fund;

(b) The Fund should be centrally administered by an existing multilateral institution possibly UNEP, World Bank, UNIDO etc;

(c) The proposal for country specific studies to determine the technology options and costs to the economies of contracting developing countries deserves support. Carrying out of such studies should, however, be concurrently implemented with the establishment of the Fund;

(d) In determining the terms and conditions for the use of the Fund, the Working Group should consider two important principles i.e. it should not burden the developing countries since the costs of compliance to these countries are probably much higher than its benefits and it should also enhance the ability of these countries to adhere to the 1987 Protocol;

(e) Contributions to the Fund should come from the developed countries, bilateral agencies and even private sector bodies. In addition, the Newly Industrialized Countries (producers of CFCs) might be asked to contribute; and

(f) Financial resources from the Fund should be made available to the respective National Governments since they would ultimately be responsible for ensuring compliance with the Protocol.

[See Attachment VI - Intervention Statement by the Malaysian Delegation]

NEXT STEP AND RECOMMENDATIONS

23. The Working Group on Funding mechanism is scheduled to meet again early next year for the purpose of finalizing its recommendations to the Contracting Parties of the 1987 Protocol which will be having its second meeting in June 1990 (London). Among the follow-up actions which need to be taken are:-

(a) The respective developing countries should immediately initiate the carrying out of the national studies (to examine the technology options and costs to their economies). Available information should be provided to the next meeting of the Working Group and also to the June 1990 meeting of the Contracting Parties; and

(b) UNEP, as the Secretariat to the Working Group, would commission a study on the funding mechanism which, among other things, would examine the institutional arrangement for administering assistance to the developing countries. The result of this study should also be made available to the next meeting of the Working Group.

24. As Malaysia is expected to become a Party to the Montreal Protocol soon, the decisions of the Working Group on Funding Mechanism will become binding on the Government. It is, therefore, proposed that the following line of actions be taken:-

(a) The carrying out of the country specific studies (to examine the technology options and costs of compliance) should be initiated as soon as possible by the Department of Environment of the Ministry of Science, Technology and Environment.

[To facilitate implementation of the study, the Terms of Reference prepared by the U.S. Delegation to the Nairobi Meeting, as in Attachment VII, could be adopted as a guide].

(b) Concerning funding for the Study, delegations from some of the developed countries indicated that their Governments would be willing to provide the resources if requested by the recipient countries. This offer should be taken up by our Government.

(c) The funding mechanism for the preservation of ozone layer will be established in the near future and Malaysia will be a beneficiary of the financial assistance once it ratifies the Montreal Protocol. In preparation for this, it is proposed that an inter-agency committee on finance comprising of representatives of the Treasury, Ministry of Science, Technology and Environment, Ministry of Trade and Industry the Economic Planning Unit, and Ministry of Foreign Affairs be formed. The Tasks of this Committee would include determining the activities to be funded, the local beneficiaries and terms and conditions on the use of fund.

ATTACHMENT I

DELEGATIONS TO THE MEETING OF OPEN-ENDED WORKING GROUP ON FUNDING MECHANISM

Contracting Parties to the Montreal Protocol

1. Australia
2. Belgium
3. Canada
4. Eqypt
5. Finland
6. France
7. Germany
8. Ghana
9. Japan
10. Kenya
11. Mexico
12. Netherlands
13. Nigeria
14. Norway
15. Sweden
16. United Kingdom
17. United States
18. Soviet Russia
19. Venezuela
20. European Economic Community

Non-Contracting Parties

1. Brazil
2. China
3. Dyibouti
4. India
5. Malawi
6. Malaysia
7. Morocco
8. Philippines
9. Korea
10. Sudan

OPEN-ENDED WORKING GROUP OF THE PARTIES TO THE MONTREAL PROTOCOL TO DEVELOP MODALITIES FOR FINANCIAL AND OTHER MECHANISMS TO ENABLE DEVELOPING COUNTRIES TO MEET THE REQUIREMENTS OF THE MONTREAL PROTOCOL

Nairobi 21-25 August 1989

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ATTACHMENT II

Report of the Informal Working Group of Experts on Financial Mechanisms for the Implementation of the Montreal Protocol Geneva, 3-7 July 1989

A. INTRODUCTION

1. The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer at their first meeting in Helsinki (2-5 May 1989) decided in Decision 5:

> to establish an open-ended working group to, inter alia, work out the modalities required by Decision 13.

The Parties decided in Decision 13:

(a) "To recognise the urgent need to establish international financial and other mechanisms to implement article 5, paragraph 2 and 3 in conjunction with articles 9 and 10 of the Montreal Protocol and to enable developing countries to meet the requirements of the present and a future strengthened Protocol, thereby addressing the ozone depletion and related problems."

(b) "To establish an open-ended working group of the Contracting Parties to develop modalities for such mechanisms which do not exclude the possibility of an international fund and to report the results of their deliberations to the Parties at their second meeting."

2. An open-ended working group will be convened from 21-25 August 1989 at the UNEP Headquarters in Nairobi to develop modalities for financial and other mechanisms to enable developing countries to meet the requirements of the Montreal Protocol.

3. In preparation for this Open-ended Working Group, an informal meeting meeting of experts (from World Bank, UNDP, UNCTAD, EEC and some experts in their personal capacity) was convened from 3 to 7 July 1989 at the UNEP Regional Office for Europe, Geneva, to discuss the basis, nature and scope of financial mechanisms. The meeting was held under the chairmanship of Mr. Y.J. Ahmad, UNEP. The list of participants is attached as Annex I to this report.

B. RATIONALE

4. Concern over the likely impact of atmospheric pollutants on the stratospheric ozone is a significant item on the world environment agenda. To address the problem of the ozone layer depletion the world community adopted in March 1985 The Vienna Convention for the Protection of the Ozone Layer, and in September 1987 The Montreal Protocol on Substances that Deplete the Ozone Layer. The latter has currently 46 signatories of whom 39 are Parties. Current theories suggest that protection of stratospheric ozone requires the phasing out of a series of man-made chemicals, especially CFCs. This would ensure that future generations would inherit a biosphere with assets and conditions that are as productive and healthy as the ones currently available in accordance with the basic objective of sustainable development.[1]

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1. World Commission on Environment and Development. "Our Common Future", Oxford University Press, 1988.

5. The use of CFCs and halons in certain production processes results in these substances being emitted into the atmosphere, where they have a residence time of around 100 years, long enough to allow their drift to the stratosphere. Here, they are responsible for damage to the ozone layer, thus allowing more of the harmful ultraviolet radiation to reach the earth. The consequences of this would include increase in the incidence of eye cataracts, skin cancers, impairment of natural immunity systems and climatic effects. Thus, in permitting further emissions of CFCs and halons, mankind would be creating an environmental hazard that is truly global and potentially devastating.

6. The present requirement of the control measures under the Montreal Protocol include:

(a) that developed countries would reduce by 50% of 1986 levels, the calculated levels of consumption of the controlled CFCs by 30 June 1999 and also freeze halon consumption[2] at 1986 levels by 1 February 1992.

(b) developing countries were allowed to delay their compliance with the above regulations for a period of 10 years during which they could increase their consumption of CFCs up to a limit of 0.3 kg/capita/year "for its basic domestic needs".

7. In accordance with Article 6 of the Montreal Protocol, the control measures in the Protocol are currently being reviewed based on the findings of the assessment panels established under that Protocol. As reflected in the Helsinki Declaration of May 1989, many countries now support the total phase out of CFCs and halons by the year 2000. The likely amendments of the control measures are: (a) an 85% reduction in CFCs by 1998 and (b) a complete phase out by 2000. However, a very small level of emissions (about 2% of current levels) would be inevitable for production processes in which the use of CFCs is essential.

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2. Consumption here means production + imports - exports. The percentage reductions and the consumption restrictions apply to the 1986 levels.

8. As far as developing countries are concerned, there are very few who have ratified the Protocol (only 10 out of the 124 countries generally classified in this category). Furthermore, the major producers and users of CFCs among the developing countries (Brazil, China, India, South Korea, etc.), are not signatories to the Protocol. For the Protocol to be fully effective in its purpose of controlling the emissions of CFCs and halons, all countries must become Parties.

9. The following questions need to be addressed in order to develop modalities for financial mechanisms to enable the developing countries meet the requirements of the Montreal Protocol:

(a) What are the costs to the developing countries of participating in the Protocol?

(b) What institutional arrangements are appropriate for mobilizing technical and financial resources?

(c) What administrative organization and structure would most facilitate such a process?

This report provides an initial attempt at answering these questions. In many cases, however, there is simply not enough information for providing all answers at this stage. However, gaps have been identified, various options presented as far as practicable and recommendations made for further work, where appropriate.

C. COSTS OF COMPLIANCE FOR DEVELOPING COUNTRIES

12. The costs of complying with the Protocol relate to the following reasons:

(a) Developing countries would have to acquire the requisite technology (including patents and royalties) from companies in developed countries to shift away from ozone-depleting CFC production;

(b) The use of non-depleting CFCs and CFC substitutes and associated capital equipment is often more expensive and would add to the foreign exchange burden in some developing countries;

(c) The purchase of goods and equipment made in developed countries that do not use CFCs may be more expensive; and

(d) There would be costs of transition to the changed production processes, including costs of training, retooling etc, now and in the future.

11. These costs would impinge on different countries in different degrees. Item (a) above would be particularly relevant to developing countries that are producers of CFCs - for example, Brazil, China, India and the Republic of Korea. Item (b) would particularly affect countries like Egypt that import CFCs for use in the domestic production of air conditioners, refrigerators and the like; and item (c) would affect countries which import the assembled equipment. Finally, item (d) affects all developing countries. It should be noted that many developing countries have future plans for development of such industries.

12. No serious attempt has been made to cost these items for developing countries. Clearly, the calculation is a complex one, including projections of demand for CFCs by country, as well as projections of the prices of CFCs and their substitutes. In addition, it should be noted that the costs of compliance will depend on what level of consumption of CFCs is permitted in these countries. This may seem obvious, but there is some doubt as to whether a period of 10 years when consumption is permitted at 0.3 kg/capita/year in these countries is environmentally acceptable (see para. 8(b) above and Article 5 of the Montreal Protocol). If a stricter regime is imposed, the cost will be correspondingly higher.

13. An initial "ball-park" figure presented to the Group for the costs of compliance by developing countries was about $400 million annually to the year 2000. This was taken from the Interim Report on Funding Mechanisms for Protecting the Global Atmosphere[3] prepared by McKinsey & Co. for the Dutch Government. It appears to be based on the following assumptions:

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3. Protecting the Global Atmosphere: Funding Mechanisms. Interim Report to Steering Committee for Ministerial Conference on Atmospheric Pollution and Climate Change (The Netherlands, 1989), McKinsey & Co.

(a) that the cost of substituting CFCs in the Netherlands is, on average, $4000/ton of CFC/year,

(b) that developing countries total production of CFCs is 108 kilo tons/year.

14. In the opinion of this group, this figure is not valid, even as an initial estimate for developing countries. First, the costs of reduction are taken from the Netherlands, which is not typical, and the kinds of changes required to meet the standards are very different in the developing countries from those in developed countries. Secondly, the reductions would be different in future years, when the potential use of CFCs in the developing countries is expected to grow and the prices of CFCs and their substitutes are expected to change. Thirdly, this does not take account of the transitional costs referred to in 12(d) above. For all these reasons, the costs of compliance could vary from this figure by a very considerable amount.

15. Since a more accurate estimate of this cost is critical to the institutional, financial and administrative steps that need to be taken, it is recommended that an attempt be made to obtain a more accurate assessment. Some basic information relevant to this already exists, but it needs to be evaluated. It would be useful if this could be done by a suitable consulting firm before the open-ended working group meeting in August 1989 (see para. 2). The co-operation of the developing countries is crucial in this connection. (The terms of reference for the work are attached as Annex II).

D. INSTITUTIONAL ARRANGEMENTS FOR TECHNICAL AND FINANCIAL ASSISTANCE

16. Noting the agreement in the Helsinki Declaration that appropriate funding mechanisms for the transfer of technologies should be developed, the group reviewed a number of such mechanisms, which are summarized below. Before considering these, it is useful to list four <u>desiderata</u> that the group identified as being relevant to the success of any financial institution that is selected.

17. The first point to be emphasized is that in the final analysis, what is required is a recognition of the global nature of the problem and the imperative of interdependence. The stakes are high for both the rich and the poor, the developed and the developing countries. It is essential that there should be a solid partnership between them if this crucial problem is to be solved. In this partnership an institution weighted in favour of the developed countries in terms of overall control would be unacceptable to the developing countries.

18. The second point is that the financial resources required for the compliance of the developing countries would be unacceptable to many of them if they were offerred on usual loan terms. In a sense, this is obvious: such terms are already available to many of these countries and they cannot afford taking advantage of them to comply with the Protocol. Another way of viewing this issue is to recognize that many developing countries argue strongly for transfer of resources on equity grounds. The justification for these transfers is that: (a) their costs of compliance with the Protocol are probably much higher relative to their benefits, as compared with those of the developed countries which, after all, have managed to use CFCs for long periods with no special cost imposed on them and (b) the magnitude of the present problem is very largely the result of CFC production in the developed countries.

19. The third point is that acceptability of this programme would be low if developing countries viewed the funding for it as reducing the funds available from the donor countries for general economic and social development purposes. In other words, it is important for this programme to be seen as additional to the existing aid programmes and not in lieu of part of them.

20. Finally, it is worth bearing in mind that the mechanism designed for this purpose could be a forerunner to the institution that would have to deal with the much larger problem of greenhouse gases in general. The latter would, of course, require much larger volumes of funding and would demand innovative financial instruments, such as a carbon tax. Nevertheless, the lessons learnt from dealing with CFCs would be extremely helpful in this regard.

21. Bearing these points in mind, we may envisage a number of institutional arrangements. The most straightforward of these would be a trust fund to which a number of the donor countries would pledge contributions. The Contracting Parties of the Protocol would form the council responsible for the overall policy management of the fund. This council would establish an executive board from its members, which would be supported by a financial and technical secretariat. The secretariat, which is discussed further in Section E, is envisaged as being quite small, but drawing upon consultants, and bilateral and multilateral agencies as and when required. A proposal along these lines is already being considered by some major developed countries. Hence, it has the merit of having some broad interest among the developed countries.

22. Two alternative schemes that might be worth considering are among those proposed by the World Resources Institute in conncection with a review of the potential scheme for funding investments in biodiversity[4]. The first is referred to as the International Environment Facility (IEF). Its functions include:

(i) to identify the unfunded part of the Third World's urgent conservation agenda;

(ii) to help arrange co-financing for overall project packages from multilateral, bilateral and private sector (corporations, foundations, NGOs) sources; and

(iii) to ensure concessionality of the funding blend in line with the economic rate of return of the project package.

As the name suggests, this would be an organization designed to facilitate the funding of capital in given areas. OECD governments and multilateral agencies would commit funds to finance projects identified through the IEF.

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4. The International Conservation Financing Project, World Resources Institutes, 1989.

According to their report, the IEF may be set up by a few leading bilaterals and multilaterals (founding sponsors) and may be housed at one of its sponsor multilateral organizations e.g. the World Bank. Its programme will be guided by a governing council which will include representatives of sponsor organizations and Third World governments. For IEF to be effective, its programme may start with a commitment for the first five years by the OECD governments to finance on the order of $3 billion in additional conservation projects. It would operate through expert staff, who would identify suitable projects and then 'persuade' the national governments and appropriate multilateral organizations to support them. The funds for doing this, however, would already exist within the budgets of these organizations.

23. The IEF is envisaged as an institution with a catalytic role that would enable it to:

(i) deliver various intermediary services to governments;

(ii) secure project finance from one or more sources;

(iii) build up international inventory of information relevant to conservation world-wide; and

(iv) set emergency action plans for critical "hot spots" that require immediate action.

The structure would differ significantly from the proposed trust fund mainly because, while the IEF would assist in project indentification, preparation and financing, the resulting financial transfers and project implementation activities would ultimately be the responsibility of the sponsoring national and international agencies.

Its Secretariat would be small but efficient, with staff combining technical and financial expertise.

24. A second scheme[5] put forward by the World Resources Institute is a Conservation Pilot Investment Programme (ECOVEST). This combines (i) a programme of conservation activities that are capable of generating flow of revenue, yet cannot readily attract private commercial capital or development finance, and (ii) an intermediary mechanism capable of securing financing by

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5. See Footnote 4 op.cit.page 41.

blending concessional (grant) funds, commercial finance and private direct investment. Its operation will demonstrate how a financial catalyst can contribute to sustainable development. Once the viability of the pilot project (first five year programme) has been shown, replication on a larger scale could be developed and incorporated in national development plans.

25. ECOVEST could be affiliated with an existing institution and have internal staff capabilities in fields of conservation project planning and design and of project financing and management.

26. The fourth type of institutional structure is detailed in a UNEP study[6]: an international financial corporation that would provide financing for anti-desertification projects with non-commercial rates of return, that are "incapable of bearing interest costs even on highly concessional terms presently available from IDA and similar financing institutions". The corporation is envisaged to have an equity capital (contributions from member countries); could borrow directly by issuing notes or bonds and could blend this with concessionary loans and grants. This will enable the corporation to combine hard and soft loans with grant funds. This corporation could be established as an affiliate or subsidiary of an existing institution (e.g. World Bank, OPEC, IFAD) or as an independent body.

E. ADMINISTRATIVE STRUCTURE

27. As far as the administrative structure is concerned, the group made the following observations:

(a) The institution would need a well qualified, competent secretariat that would be capable of providing technical and financial and legal advice and in appraising and monitoring programmes;

(b) Given the diverse nature of skills required, however, it would be better to keep the permanent professional staff of the secretariat small and draw on short term consultants and other international agencies' expertise as and when necessary; and

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6. Feasibility Studies on, and Detailed Modalities for Financing the Plan of Action to Combat Desertification, A/36/141.1 October 1981

(c) The staff would have to be experienced in their respective fields as well as having an understanding of the industrial problems of developing countries and of the practices and procedures of the donor agencies.

28. What remains to be determined for such a secretariat is:

(a) where it would be located;

(b) whether it would be under the administrative umbrella of some existing organization, or totally independent;

(c) on what terms it would operate and how it would disburse its funds; and

(d) what its acceptability would be among the developing countries.

F. SUMMARY AND CONCLUSIONS

29. The hazards related to the depletion of the stratospheric ozone represent one of the environmental issues with global and potentially devastating dimensions. The world has started to address it through the Vienna Convention (1985) and the Montreal Protocol (1987). Implementation of these legal instruments requires a programme of action and mechanisms for managing and financing their implementation.

30. There is need for additional resources to assist developing countries to comply with the requirements of these international agreements. The costs the developing countries are likely to incur need to be estimated in order to determine the mechanisms required to mobilize and to transfer the necessary resources. A study will be conducted under UNEP to estimate these costs.

31. A mechanism designed for the implementation of an ozone related programme of action would be a forerunner for a more elaborate mechanism that would be needed to address the problems of greenhouse gases and climatic change.

32. Four possible institutional arrangements for providing financial support to developing countries are as follows:

(i) trust fund;

(ii) international environmental facility;

(iii) pilot investment programme; and

(iv) an international financial corporation.

The common feature of these mechanisms is the ability to finance the requirements of the developing countries as they adhere to the Vienna Convention and the Montreal Protocol.

A N N E X I

Meeting Expert Group on Financial Mechanisms
Geneva, 3-7 July 1989

LIST OF PARTICIPANTS

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ANNEX II

ESTIMATING THE COSTS OF COMPLIANCE WITH THE MONTREAL PROTOCOL FOR DEVELOPING COUNTRIES

Terms of Reference

Preamble

1. A key problem that has arisen with regard to the international attempts to control the emissions of CFCs has been the hesitation on the part of many developing countries in view of the costs involved to be Parties to the Montreal Protocol. Moreover, many of them are large potential producers of CFCs. Hence, their participation in the Montreal Protocol is critical to the long term success of that Protocol.

2. Within the Montreal Protocol and its follow-up meeting in Helsinki in May 1989, it has been explicitly acknowledged that developing countries are likely to incur substantial costs if they do ratify the Protocol and that they should be provided with technical and financial assistance. (Articles 5, 9 and 10 of the Montreal Protocol and Decision 13 of the Helsinki Meeting).

3. In order to assist this process, a working party of experts met in Geneva in July 1989 to identify the appropriate financial mechanisms for the provision of such assistance. Their report is attached to these terms of reference. However, one major problem they had was to obtain an estimate of the magnitude of the problem. How large would the transfer of funds have to be to assist the developing countries to meet the requirements of the Protocol? A very rough estimate provided by one consulting firm was $400 million a year. However, the basis of this estimate was unacceptable to the group of experts.

Objective

4. The objective of this study would be to provide an estimate of the order of magnitude of the costs of compliance with the Montreal Protocol for the developing countries. It is understood that a precise figure is well beyond the scope of a study conducted within the short time-frame proposed for this study. Hence, the aim here is to (a) identify the main legitimate items in the costs of compliance and (b) to give a very rough estimate of their cost.

5. The consulting firm would have access to the reports of the economic and other panel established under the Montreal Protocol as well as relevant information collected by UNEP. The firm would not be expected to gather new data. However, he would evaluate critically existing estimates and use them as appropriate.

6. The time available for the study is circumscribed by the need for an estimate before the meeting of an open-ended working group to be convened from 21 to 25 August at the UNEP Headquarters in Nairobi to develop modalities for financial and other mechanisms to enable developing countries to meet the requirements of the Montreal Protocol. Hence, the paper would have to be produced by the consulting firm by August 14th, 1989.

ATTACHMENT III

"PLEASE CHECK AGAINST DELIVERY"

EMBARGOED: 21 August 1989

THE TOOLS TO BUILD A GLOBAL RESPONSE:

FINANCIAL MECHANISMS FOR THE MONTREAL PROTOCOL

Statement by

Dr. Mostafa K. Tolba

Executive Director

United Nations Environment Programme

To The Meeting of the Working Group of the Parties

to the Montreal Protocol

[Funding Mechanisms]

Nairobi, 21 August 1989

Ladies and Gentlemen.

It is my honour and pleasure to open this meeting. Permit me to begin by welcoming you to our United Nations Environment Programme headquarters, to our host city of Nairobi, and to our host country of Kenya.

Over the next five days, you will be involved in tough and detailed discussions on the many options before you, and not, I am confident, on the differences of opinion that divide you. For a remarkable consensus has emerged. Global solidarity is being brought to bear. I have no doubt it will propell this Group to find effective and equitable financial mechanisms to ensure co-operation in our effort to safeguard the Earth's ozone layer.

As the working agenda for this meeting is full, my remarks will be brief.

In compliance with the Decisions of the Helsinki first meeting of the Contracting Parties of the Montreal Protocol, your governments agreed on the urgent need to work out financial and other mechanisms to ensure the full participation of developing countries in the present and future Protocol. They recognised that there is an urgent need for all states to join hands and become Party to the Protocol, and to comply with the control schedule. Science informs us that only full global compliance with stricter controls than currently contained in the Montreal Protocol will return the ozone layer to its pre-industrial, undamaged state.

To date, however, very few developing countries -- in fact only 13 -- have ratified the Protocol. Reticence to ratify is obviously not born of a lack of concern, but rather of a lack of resources necessary to meet the requirements of the Protocol without serious development disruption. Equitable financial mechanisms are therefore absolutely crucial to a) ensure a global participation, and b) asssure developing countries that global environmental protection is consistent with their legitimate development needs.

Science indicates the worst effects of diminished ozone layer may be felt in the richer countries of the North. The skin of nationals of some countries in the North is most vulnerable to radiation damage. Ozone losses are predicted to be greater in higher latitudes than in the tropics. Although the degree of vulnerability may vary, science also indicates all people and all regions are susceptible to increased UV-radiation. We all understand the scientific consensus. Increased UV-radiation will lead to an increase in the incidence of cancer and cataracts. The human immunity system could be diminished, agricultural productivity could be reduced, world food trade could be disrupted.

Yet the costs of compliance will probably not fall evenly in North and South. Costs to developing countries in controlling ozone-layer depleting substances are in fact likely to be substantially higher, relative to their incomes and even to their benefits.

A strong partnership is thus needed to guarantee a universality of response. The North must help the countries of the South in securing their development needs and the South must commit itself to strong contribution to global atmospheric protection.

Assistance to developing countries must entail additional funding to existing aid programmes. Assistance based on usual loan agreements is not

the solution. Developing countries, most of them at least, are heavily burdened with debt and debt service. Concessionary funding and outright grants are what is needed.

Ladies and Gentlemen. Specific financial mechanisms are very often at the heart of international agreements. This Protocol is no exception. Decisions involving money, commercial and trade interests are not the fruit of an informal process. They are instead the produce of rigorous negotiations, and of a spirit of give and take.

Agreement on financial matters was not reached in Helsinki. Decisions were deferred. Doubt has been expressed by some that a delay in decision is synonomous with a failure in consensus.

The challenge facing this Working Group at this and at its future meetings is to end the doubt, to continue and intensify discussions, and to emerge with equitable and realistic recommendations. The Helsinki Declaration and Helsinki meeting of the Parties sealed the intentions. It is a milestone in global environmental protection. We must ensure it becomes a milestone in North-South co-operation.

There are four questions that need answers during your meeting today and your future meetings. They are, one, what is the price-tag to developing countries for compliance with current and more tightened Protocol? Two, what is the breakdown of such costs? Three, what are the possible sources of financing such costs? and Four, what modalities will best ensure the defraying of such costs and thus ensure the maximum participation necessary to achieve the Protocol's urgent goals?

In answer to the first, one initial cost estimate to developing countries in compliance is $400 million annually to the year 2000. That figure is, I repeat, an estimate. I expect more accurate and dynamic costing forecasts will soon be forwarded.

That of course is not a static formula, since -- for example -- chlorofluorocarbon use in developing countries is expected to increase. I am fully aware of the view that the increase in use during the targetted 10-year grace period afforded the developing countries by the Montreal Protocol may not lead to a new large fraction of the 1986 production levels. Another non-static element is that the price of substitutes is expected to change from current forecasts.

Turning to the second question, a breakdown of the major costs. Developing countries are talking essentially of the cost of technology transfer.

A major question awaiting this meeting is to decide what we mean by technology transfer? In this respect I see four types of issues facing the developing countries -

(1) to have the technology to produce alternative chemicals;
(2) to have the technology to use these new chemicals,
(3) to face the cost of equipment -- such as refrigerators -- that will contain these new substances?
and (4) to face the cost of amortizing existing production capacity faster.

It is thus clear that the costs involved will have to be based on three types of expenditure.

a), developing countries engaged in CFC production will need technology -- as well as patents -- from companies in the North to shift production reliance away from ozone-destroying chemicals. They will need adjustment of their existing industries to meet the requirements of the new substitutes. Most of the costs here will result from changed production processes.

Countries affected by this first type of expenditure are those engaged in CFC production -- including for example Brazil, China, India and the Republic of Korea.

b), The use of non-depleting partially halogenated chlorofluorocarbons and other substitutes will likely push up capital equipment, as well as training and retooling costs. Countries such as my own - Egypt - will likely pay higher prices by importing CFC substitutes for domestic production of durable goods, such as refrigerators and air conditioners. They, as the first group, will also have to meet the cost of adjusting their industries now using the CFCs.

And c), Developing countries purchasing goods and equipment containing CFC-substitutes will likely experience cost increases at the commercial level.

As to the third question, what are the possible sources of financing such costs? I believe you will have to consider conventional and innovative sources like innovative international taxes. And finally the fourth question, what are the institutional options to meet such costs? With respect to this particular question I would like first to mention two things (1) that the ad hoc working group will meet again in September to address the issue of workplans required by the Protocol which include the subject of technical assistance. And (2) as indicated in my note to you, I have convened an informal consultation with a small number of experts last month in Geneva chaired by my colleague Mr. Yusuf Ahmad to whom I am most grateful. Four possible options for institutional arrangements of such financial mechanisms emerged from that Geneva meeting.

1) an international Trust Fund, to which donor countries would pledge contribitions. Offering the most straightforward institutional mechanism, it would be supported by a financial and technical secretariat.

2) an International Environment Facility, designed to identify and match available bilateral and multilateral funding with individual projects in developing countries using soft CFCs and other substitutes. A sort of a clearinghouse mechanism.

3) a specially instituted financial organization, which would act as an investment intermediary engaged in capital accumulation and risk spreading so as to arrange access by developing countries to environmentally sound technology and investment in sustainable development.

And 4) an independent financial corporation whose shareholders would comprise of contributions from all potential clients and donors. Equity would be directed to assist developing countries in meeting compliance costs through direct grants or reducing interest rates of long-term commercial loans.

Ladies and Gentlemen: A final consideration.
The ozone layer loss is but one aspect of another, more complex global atmospheric problem -- climate change and global warming.

The recommendations that emerge from this working group could be -- and probably should be -- part of the underpinnings of a larger effort to ensure global action to address climate change and global warming.

While the problems will be more difficult and the costs higher, the mechanisms we design for the Protocol will -- very likely -- become the blueprint for the institutional apparatus designed to control greenhouse gases and adaptation to climate change.

Ladies and Gentlemen,

The main concern of this Group is to propose effective and efficient financial mechanisms which will help ensure the full participation of developing countries in the common cause of protecting our ozone layer.

Solutions will be more easily found if we work together and draw counsel from one another. It is only through co-operation that agreement will emerge. Agreement is what the world needs to ensure our planet's future. The task is difficult - but the international climate is now conducive of real co-operation. And during this meeting and probably one or two more meetings, I am confident you will find the common ground and reach agreement.

Your governments are all committed to saving our Earth. Let us give them the means for achieving their moral intergenerational goal.

Thank you.

ATTACHMENT IV

Recommendations of the Drafting Group on "transfer of technology" to the Working Group of Experts on Financial Mechanisms for the Implementation of the Montreal Protocol.

1. Participants

The Drafting Group consists of representatives from Brazil, Federal Republic of Germany (chair), India, Japan, Netherlands, People's Republic of China, United Kingdom, United States of America, Venezuela and the European Community.

2. Task of the Drafting Group

The Drafting Group set up by the Chairman of the Working Group of experts on Financial Mechanisms for the implementation of the Montreal Protocol, has been asked to list the activities which could be taken in developing countries in compliance with the Montreal Protocol related to "transfer of technology".

3. Recommendations

3.1 In the context of international financial mechanisms "transfer of technology" means "facilitating access to environmentally safe alternative substances and technologies for Parties that are developing countries and assist them to make expeditious use of such alternatives ("Art 5 Para.2) by meeting incremental costs associated with the transition from the controlled substances to alternatives and substitutes.

3.2 Incremental cost which might be covered by the international financial mechanism would include the following:

3.2.1. Production

3.2.1.1. Cost of conversion of existing production facilities.

- cost of patents and designs and incremental cost of royalties
- capital cost of conversion
- cost of retraining of personnel

3.2.1.2. Cost of scrapping existing plants

- loss of investments in productive capacity of controlled substances identified now or to be identified in the future before a cut-off date which will require definitior
- loss of employment; it was noted that this might prove difficult measurement and administration; a method of measurement needs to be defined.

3.2.1.3. Cost of establishment of new production facilities for substitutes of capacity equivalent to the scrapped plants.

- cost of patents and designs and incremental cost of royalties
- capital cost
- cost of training

3.2.1.4. Cost due to capacities rendered idle for the sake of compliance with the Montreal Protocol

3.2.2. Use as an intermediate good

3.2.2.1. Cost of conversion of existing equipment manufacturing facilities

- cost of patents and designs and incremental cost of royalties
- capital cost
- cost of retraining

3.2.2.2. Cost of modification or replacement of user equipment if required by the Montreal Protocol.

- increased cost of patents and designs and incremental cost of royalties
- capital cost
- cost of retraining

3.2.3. Action at consumer level.

3.2.3.1. Training cost for setting up a system for collection, and destruction of ozone depleting substances falling under the Montreal Protocol and any future amendment to it.

3.2.3.2. Cost for providing technical assistance to reduce consumption and unintended loss of ozone depleting substances.

ATTACHMENT V

DETERMINATION OF TOTAL COSTS
(recommendation of the drafting group)

The Working Group took note of the available estimates of the costs of conversion to CFC substitutes from various sources. The Group considered that these estimates provided an initial indication of the range of costs involved, but could not comment on their accuracy in the absence of the details of methodologies followed. The UNEP secretariat should prepare a paper setting out the methodologies and assumptions underlying these estimates and make it available to all the countries at least 6 weeks in advance of the next meeting of the Working Group in February 1990.

The Working Group felt that country specific studies would be helpful to get accurate estimates of the total costs and their phasing. These national studies should be carried out on the basis of common methodologies and format in a number of developing countries representing different categories of CFC producers, product manufacturers and importers of products.

The developing countries considered that it was essential to address the setting up of funding mechanisms even before more accurate cost estimates are available by considering the available estimates as a preliminary basis for further consideration of the matter.

Representatives of industrialized countries indicated that that they would be in a position to help with the financing of country studies at short notice if requested by the relevant government.

The Working Group recommends that such national studies be initiated immediately and the information available be provided to the next meeting of the Working Group and the next meeting of the Parties in June 1990.

ATTACHMENT VI

MEETING OF THE OPEN-ENDED WORKING GROUP TO DEVELOP MODALITIES FOR FUNDING MECHANISM TO ENABLE DEVELOPING COUNTRIES TO COMPLY WITH THE MONTREAL PROTOCOL (UNEP HEADQUARTERS, NAIROBI - AUGUST 21-25 1989)

INTERVENTION STATEMENT BY MR. NIK NAJIB HUSAIN, DELEGATION OF MALAYSIA

INSTITUTIONAL ARRANGEMENT AND FUNDING MECHANISM

Mr. Chairman,

Permit me to refer to the proposal submitted by the Delegates of the Nordic countires and Netherlands this morning where reference was made to a "Commissioned Study on Institutional Mechanism". With due respect, it is my view that we may not need such a study. The information that have been made available to us at this meeting are sufficient for us to move forward.

2. My delegation has been able to peruse a Paper prepared by the World Resources Institute/UNDP which talks about the International Conservation Financing. The Paper put forward four new options to provide additionality in conservation financing:

(a) IEF

(b) Ecovest

(c) World Environmental Fund

(d) Linkage between debt reduction and policy reforms in areas of conservation.

3. References to these financing mechanisms have been made in the Report of the Informal Working Group of Experts on Financial Mechanism, the Executive Director's Report and the Opening Statement of the Executive Director. On this basis, I am of the opinion that we should now move ahead by taking a position at this meeting.

Mr. Chairman,

4. It is my delegation's view that the idea on the establishment of a Trust Fund should be given serious consideration by us. Already some donor countries have intimated that they are willing to commit resources for the purpose of financing activities related to preservation of the ozone layer. I think we should start from here and make a commitment to set up the Fund.

5. As to the timing for the creation of the Fund, we should not wait for all the studies to be completed. The carrying out of the studies and setting up of the Fund should go hand in hand. Physical funding of the activities should, of course, begin after the required studies have been completed and the actual requirements of the beneficiaries have been quantified.

6. Now let me turn to the institutional arrangement. Mr. Chairman, we have to identify the organization to manage the Fund. In this connection, we should avoid creating a new institution. We do not have enough time on our hand. We should not waste resources by creating a new bureaucracy. It is my delegation's view that the management of the Fund should be handled by an existing multilateral body - possibly UNEP, World Bank, UNIDO etc.

7. I would like to refer to the Opening Statement by the Executive Director where the Trust Fund option was mentioned and I quote:

> "an international Trust Fund to which donor countries would pledge contributions. Offering the most straight forward mechanism, it would be supported by a financial and a technical secretariat"

Perhaps this would answer two of the seven questions that Mr. Chairman posed to us this morning.

8. Concerning the size of the Fund, I think we should not be involved in an acrimonious debate on how much should be in the Fund. If its creation is dependent upon us knowing the exact quantum of the financial requirements of all developing

countries, then it will take us a number of years before we see the light at the end of the tunnel. For a start, perhaps we should talk of a ball park figure, say, US$400 million per year for the next 10 years - a figure that has come out of the Mc Kinsey's Report. I hope this issue could be resolved at the end of this Meeting. We should not wait for the needs of the beneficiaries to be quantified before we agree on the creation and size of the Fund. Other details including burden sharing among the donor countries could be done at a later stage.

9. Turning to the application of the Fund, it may be pertinent for us to consider on what terms and conditions should the Trust Fund be disbursed. We have already heard yesterday about grants and loans at concessionary terms. While we are clear about the grant, we need to determine what do we mean by loans at concessionary terms and who should be given grants and who should be provided with loans. Is it determined on the basis of country or activities being financed?

10. As for the terms and conditions of the Fund, it is sufficient for me at this juncture, to say that two important principles should be given consideration:-

(i) It should not burden the recipient countries. As mentioned in the Executive Director's Report, the cost of compliance to the developing countries are probably much higher than its benefits as compared to the developed countries; and

(ii) It should enhance the ability of the developing countries to comply with the provisions of the Montreal Protocol. Here I am referring to the political commitment of the respective Governments to comply with the Protocol.

Thank you.

MEETING OF THE OPEN-ENDED WORKING GROUP
TO DEVELOP MODALITIES FOR FUNDING MECHANISM
TO ENABLE DEVELOPING COUNTRIES TO COMPLY
WITH THE MONTREAL PROTOCOL
(UNEP HEADQUARTERS, NAIROBI - AUGUST 21-25 1989)

INTERVENTION STATEMENT
SOURCES OF FUNDING AND BENEFICIARIES

1. When we discuss sources of funding, it is implicit that we are talking of funding of the Trust Fund which will be centrally administered by an existing multilateral organization.

2. From the developing countries perspective, the contribution from donor countries to the Fund should be additional to the current level of Official Development Assistance (ODA) that are being channelled to these countries.

3. Already some developed countries have intimated at this meeting that they are willing to contribute. That's a good start. Funding to the Trust Fund could come from contribution by donor countries from the developed world and bilateral agencies and even private sector bodies which are supportive of our endeavour. Additional sources could come from voluntary contributions from internationally renowned Foundations.

4. In addition, the middle income developing countries especially the NICs may be asked to contribute to the Trust Fund as part of the endeavour to promote the South-South cooperation. After identifying the sources of funding, the next step is to devise formula on the contribution by donor countries, bilateral agencies and private sector including private Foundations.

5. Donors should not be wary on the possibility of misuse of funds. They do not normally give blank cheques to the beneficiaries in the first place.

6. To my mind, assistance to the developing countries should be channelled through their National Governments. On the question of how it is to be channelled to the final beneficiaries and types of activities to be funded, I would suggest that this should be laid down in Agreements/Memorandums of Understanding between the donors and the countries concerned.

Thank you.

MEETING OF THE OPEN-ENDED WORKING GROUP
TO DEVELOP MODALITIES FOR FUNDING MECHANISM
TO ENABLE DEVELOPING COUNTRIES TO COMPLY
WITH THE MONTREAL PROTOCOL
(UNEP HEADQUARTERS, NAIROBI - AUGUST 21-25 1989)

INTERVENTION STATEMENT

Mr. Chairman,

1. I would only like to focus on the institutional arrangement aspect. I share the view that there is a need to assess the capacity of existing multilateral institutions in dealing with with environmental issues including the preservation of ozone layer. The World Bank has, for example, strengthened its capacity to address environmental issues in borrowing member countries through the setting up of a specialized Environmental unit. The Bank also has the expertise to carry out the required feasibility studies.

2. Concerning funding, donor countries and bilateral agencies could, perhaps, channel their contributions through the institution to fund the environment related activities including preservation of the ozone layer.

3. In view of the constraints in terms of time, it is my Government's view that we should start by utilizing the existing institutional set-up.

Thank you.

NATIONAL STUDIES: Proposed Outline
(All information to be provided by substance:
CFC 11, 12, 113, 114, 115; Halon 1211, 1301, 2402;
Carbon Tetrachloride; Methyl Chloroform)

. Inventory of Current Needs

A. Production of Substances
capacity of existing facilities
current production levels
capacity of any facilities under construction
(details on start, completion dates)
year facility built and expected useful life
ability to switch production from CFC to HCFC production

B. Consumption of Substances
imports
exports

C. Products Containing Substances
by type of product (e.g. refrigeration, air conditioner, aerosol, etc.)
Base: amount now "in service" (existing capital stock)
Rate of increase: annual increase
indicate $ value of product (wholesale, retail)
indicate % manufactured, imported, exported
indicate volume of substances "contained"
inventory of manufacturing facilities that make products containing substances and expected useful life

D. Products Made with Substances
by type of product (e.g. flexible foam, electronic equipment, etc.)
Base: amount now "in service"
Rate of increase: annual increase
indicate volume of substances used
indicate % manufactured, imported, exported
indicate $ value of products
indicate technology used

I. Estimate of Future Needs

by use of substance (e.g. refrigeration, aerosol, foam, plastics, electronics, etc.)
estimate over next 10 years
indicate basis for estimate (e.g. % increase in GNP, % increase in population, etc.)

III. Analysis of Control Options and Costs

by use of substances (e.g. refrigeration, aerosol, foam, plastics, electronics, etc.)
evaluate range of options to reduce use of substances
include product and chemical substitutes and recycling
evaluate costs of reduction options
evaluate availability of reduction technologies

IV. Employment and Training

indicate current employment in facilities
- producing substances
- manufacturing products containing
- manufacturing products made with

indicate any increase in jobs that non-CFC alternatives create
indicate current programs for training of employees
indicate needs for training

Terms of Reference
National Studies
of
Costs and Feasibility of Reducing Use of CFCs,
Halons, Carbon Tetrachloride and Methyl Chloroform
in
Developing Nations

Introduction

The Working Group agrees that national studies should be used to calculate the costs and feasibility of reducing use of chlorofluorocarbons (CFC), halons, carbon tetrachloride and methyl chloroform ("substances") in developing nations.

The objectives of these feasibility studies are to determine phaseout costs and evaluate technology options in representative developing countries for reducing the use of controlled substances consistent with the Montreal Protocol. Initial studies are essential to better understand the costs of these actions.

The feasibility studies include three steps:
Step One - Determine supplies and sources of substances,
Step Two - Analyze specific uses of substances, and
Step Three - Evaluate alternatives for reducing uses of substances by industry.

A feasibility study begins with identifying technical experts from industrialized countries to work with experts and officials from developing countries. This team of experts would gather the following information:

1: Determine current supplies and sources of CFCs, halons, carbon tetrachloride and methyl chloroform.

2: Estimate national demand for ten-year period; estimate by use, industry, new products vs. servicing, etc.

3: Determine applicable short- and long-term alternatives and potential technological modifications for manufacturing processes and products; estimate costs.

4: Identify options to implement recommendations, including sources of new technology and financing.

The attached steps list the information that should be provided in national studies regarding CFCs and halons. To the extent possible, similar information also should be provided on carbon tetrachloride and methyl chloroform.

STEP ONE Determine supplies and sources of CFCs and halons

Collect information on CFCs and halons:

- current domestic production capability
- current level of imports
  - by exporting country
  - by Party/non-Party
- projected future supply sources of CFCs and halons

Collect information on CFC/halon substitutes:

- evaluate costs and options for CFC substitutions
- evaluate costs and options for halon substitutions
- feasibility of domestic production
- possible sources for technology
- possible sources of capital
- possible private/government participants in project
- required infrastructure needs to produce substitutes
- potential market for substitutes
  - domestic market
  - export market

STEP TWO Analyze specific uses of CFCs and halons by sector

Estimate national use of controlled substances to year 2000:

	CURRENT USES	NEW USES BY 2000
	[kilograms]	
CFC-11		
CFC-12		
CFC-500		
CFC-113		
CFC-114		
CFC-115		
CFC-502		
Halon 1211		
Halon 1301		
Halon 2402		

Estimate by sector current national uses and projected future uses to year 2000:

AEROSOLS

- current uses
  - pesticides
  - consumer products
  - other products
- source of current products
  - domestic production
  - imports and country of origin
  - exports and country of destination
- basis for growth in demand
  - domestic consumption
  - potential export markets

- current domestic production facilities
    - size and structure of industry
    - size and expected useful life of manufacturing facilities

- projected source for meeting future demand
    - expanded domestic production
    - increased manufacturing inputs and sources of supply
    - infrastructure requirements for expanded manufacturing, production
    - possible sources of technology
    - possible sources of capital
    - likely private/government participation in expansion

REFRIGERATION

- types, quantities of systems in use and main applications
    - household
    - commercial
    - industrial
    - transportation

- current capital stock of refrigeration units and estimated remaining useful life

- projected demand for units in year 2000

- source of current products
    - domestic production
    - imports and country of origin
    - exports and country of destination

- projected growth in demand
    - domestic consumption
    - potential export market

- current domestic manufacturing facilities
    - size and structure of industry
    - size and expected useful life of manufacturing facilities

- projected source for meeting future refrigeration demand
    - expanded domestic production
    - increased inputs (possible sources)
    - infrastructure requirements for expanded manufacturing, production
    - possible sources of technology
    - possible sources of capital
    - likely private/government participation in expansion

AIR-CONDITIONING

- types of systems in use and main applications
  - household units
  - building chillers
  - automobiles, trucks

- current capital stock of air-conditioning units and estimated remaining useful life

- projected demand for units in year 2000

- source of current products
  - domestic production
  - imports and country of origin
  - exports and country of destination

- basis for growth in demand
  - domestic consumption
  - potential export market

- current domestic production facilities
  - size and structure of industry
  - size and expected useful life of manufacturing facilities

- projected source for meeting future a/c demand
  - expanded domestic production
  - increased inputs (possible sources)
  - infrastructure requirements for expanded manufacturing, production
  - possible sources of technology
  - possible sources of capital
  - likely private/government participation in expansion

FOAMS

- quantities, types of foam products manufactured and used
  - rigid
    - packaging
    - insulation
    - insulation for refrigerators
  - flexible

- extent to which CFCs or other blowing agents/product substitutes now employed

- projected foam demand use by year 2000

- source of current products
    - domestic production
    - imports and country of origin
    - exports and country of destination

- basis for growth in demand
    - domestic consumption
    - exports

- current domestic manufacturing facilities
    - size and structure of industry
    - size and expected useful life of manufacturing facilities

- projected source for meeting future demand
    - expanded domestic production
    - increased inputs (possible sources)
    - infrastructure requirements for expanded manufacturing, production
    - possible sources of technology
    - possible sources of capital
    - likely private/government participation in expansion

CLEANING AGENTS

- types of cleaning agents used
    - metal cleaning
    - electronics

- projected demand by use in year 2000

- source of current products
    - domestic production
    - imports and country of origin
    - exports and country of destination

- basis for growth in demand
    - domestic consumption
    - exports

- current domestic manufacturing facilities
    - size and structure of industry
    - size and expected useful life of manufacturing facilities

- projected source for meeting future demand
    - expanded domestic production
    - increased inputs (possible sources)

- infrastructure requirements for expanded manufacturing, production
- possible sources of technology
- possible sources of capital
- likely private/government participation in expansion

HALONS

- estimated number and uses of Halon 1211 products
- estimated number and uses of Halon 1301 products
- estimated use of Halon 2402

STEP THREE **Evaluate alternatives for reducing CFC and halon use by industry**

- evaluate current manufacturing processes
  - age of equipment
  - efficiency of process
- identify near-term reduction steps and costs/savings
  - housekeeping
  - recycling
  - blends/chemical substitution
  - near drop-ins
- identify long term retrofit options and costs
  - chemical substitution
  - process change
- identify costs and options for new facilities
  - incremental costs of substitute-based manufacture
  - potential market for production

STEP FOUR Evaluate priority projects and identify sources of funding

- evaluate feasibility of short- and long-term options to reduce CFC/halon use

- identify sources of funding
  - domestic/government
  - multilateral
  - bilateral

- identify options for availability of technology transfer
  - joint ventures
  - licensing
  - non-proprietary technologies

- identify institutional barriers to project success
  - infrastructure needs

5. CHEMICAL PROCESS INDUSTRY

This section deals with emissions from the manufacture and use of chemicals or chemical products. Potential emissions from many of these processes are high, but because of the nature of the compounds they are usually recovered as an economic necessity. In other cases, the manufacturing operation is run as a closed system allowing little or no escape to the atmosphere.

In general, the emissions that reach the atmosphere from chemical processes are primarily gaseous and are controlled by incineration, adsorption, or absorption. In some cases, particulate emissions may also be a problem. The particulates emitted are generally extremely small and require very efficient treatment for removal. Emission data from chemical processes are sparse. It was therefore frequently necessary to make estimates of emission factors on the basis of material balances, yields, or similar processes.