results, EPA has initiated a program to review the effectiveness of SIPs in all nonattainment areas. Two weeks ago I wrote the governors of all States with nonattainment areas informing them of this program. Our Regional Offices have been in touch with the top environmental officials in each State to communicate the same message.

We are serious about enforcing current SIPs, and upgrading those SIPs that are not adequate for meeting the standard. We want to make certain that the States adopt the measures described in their SIPs, that those measures are adequate for attainment, and that the SIPs are implemented effectively.

In order to ensure full and effective implementation of SIPs, EPA is prepared to apply the economic sanctions defined in the Clean Air Act. In some areas, we have discretion in applying sanctions. For example, in cases where a State is failing to implement its SIP, EPA may impose a ban on certain major new construction in the nonattainment area. In addition, air program grants and sewage treatment grants may be withheld.

In other cases, the Clean Air Act narrowly limits EPA's discretion. For those areas of the country whose plans fail to demonstrate attainment by the end of 1987, the Clean Air Act requires EPA to disapprove their plans and, in some cases, to impose economic sanctions. For some of these areas, EPA

would be required to impose a ban on certain major new construction, and the Agency could, at its discretion, withhold sewer construction, highway construction, and air program grants. For other areas EPA could impose all of these sanctions at its discretion.

We have not yet determined which States fall into which of the various categories. It is still too early to say which sanctions EPA will have to impose, which sanctions we will choose to impose, and which States will have to face sanctions of either kind. But it is certainly time that we all recognize the seriousness of the ozone nonattainment problem we are facing today.

I am not looking forward to the imposition of sanctions. They will cause economic disruption wherever they are applied, and the political repercussions will be felt by all of us. However, the use of sanctions in some circumstances may be necessary to convince some States that we are serious about the planning process that they must undergo in under to demonstrate attainment. In other circumstances, the use of sanctions is mandatory under the law. I expect that EPA will be able to define exactly what kinds of sanctions will be proposed in what areas sometime this summer.

I am fully aware that the imposition of sanctions is a politically sensitive action that, in some circumstances, could lead to protracted litigation. The Clean Air Act is

simply unclear in respect to when Congress wanted sanctions applied, and which ones. Over the next few months, I will be taking actions within our best understanding of the law.

However, the current law gives us little guidance on how to treat areas that do not demonstrate attainment by the end of this year. In other words, the Clean Air Act does not now address the problem of long-term, chronic nonattainment. Despite the VOC emissions reductions that will result from the kind of near-term actions I described earlier, many ozone nonattainment areas still will not meet the national standard in the foreseeable future. Some of those areas need to reduce VOC emissions by 50 percent or more, and reductions of that magnitude will require political consensus and serious longrange planning. It could be quite useful to review and revise the issues of sanctions and deadlines.

How much time should such areas be given to reach attainment? Should there be any deadline at all for reaching attainment? Should the deadline be the same in all areas? Based on my experience implementing the current law, I believe that deadlines are essential in order to force action. But they must be realistic. They also must take into consideration the practical problems involved in reaching attainment in the worst areas. I suggest that we will achieve the most fruitful results in all kinds of nonattainment areas if we tailor the attainment deadline to the specific circumstances of each nonattainment area.

Let me sum up my position on the need for Clean Air Act amendments for acid rain and ozone nonattainment. For acid rain, I do not believe that a decision on the need for a large, near-term reduction in emissions as called for in bills currently before the Senate is appropriate or compelling at this time. I have articulated my reasons for that position on many occasions, and again today. As far as ozone is concerned, I believe our current method of setting the standard is workable and effective.

Finally, I would like to comment on the Clean Air Act as a whole. Clearly, acid rain and ozone nonattainment are not the only issues that could be clarified by amendments to the Clean Air Act. The National Commission on Air Quality made literally dozens of recommendations for changes covering virtually every part of the law. However, I think everyone recognizes that the Clean Air Act, as technically complex and flawed as it may be, is a very workable law that could continue to serve us well for many years to come.

With the possible exception of the provisions for nonattainment, we are also able to live with the law as is. The law has worked in the past, it is working today, and I am confident that even in its current shape it can continue to work for years into the future.

Ralph B. / Bob L.
To: Nancy Risque
From: Tuck

May 21, 1987

President Ronald Reagan
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20500

Dear Mr. President:

The depletion of stratospheric ozone by halocarbon compounds presents one of the most important environmental challenge of our time. The consequences of inaction would be unprecedented - millions of new cases of skin cancer, millions of dollars in damage every year to crops and materials, increasing air pollution, and a powerful stress on our forests and oceans.

Recognizing the singular nature of the threat, more than two dozen nations have been negotiating a protocol under the sponsorship of the United Nations Environment Programme to limit the emissions of halocarbons. E.P.A. Administrator Lee Thomas took an important leadership role in this process when he announced the U.S. position calling for a 95% phaseout of emissions with interim reductions of 20% and 50%. A large near term reduction of 50% is needed to provide the incentive for the development of substitute chemicals, which the industry says can be available in quantity in five years. The 95% phaseout is needed for two reasons. First, just to stabilize concentrations in the atmosphere at current values, an 85% reduction in emissions is required. Secondly, only a strong commitment by the industrialized nations to wean themselves from dependence upon these chemicals will create the credibility necessary for the rest of world to cooperate in the Vienna Convention. Increasing per capita consumption in the less developed countries is sure to offset reductions in the U.S., Japan, and Europe if the commitment to an eventual phaseout is absent.

Decisions are currently being made within the Domestic Policy Council as to the final U.S. position. An automatic interim 50% target and a commitment to the longterm phaseout are the critical elements of the U.S. position. The wisdom of that position was reaffirmed at a Senate hearing last week when scientists for the first time stated that halocarbons are the likely cause of the ozone hole over Antarctica. The existence of the hole underscores the urgent need to act. With this new evidence in hand, the Europeans and Japanese have been moving toward the U.S. position, so this is no time to compromise on these two critical elements.

As leaders of the major enviromental organizations in this country, we commend the strong leadership exercised by your E.P.A. on this issue, the most critical environmental issue of our time. Successful negotiation of a strong protocol to protect the ozone layer would make a distinguished and lasting landmark for your Presidency. We urge that you lend your personal support to the position developed by the E.P.A.

Respectfully,

John H. Adams
Executive Director
Natural Resources Defense Council

Jay D. Hair
Executive Vice President
National Wildlife Federation

Peter A. Berle
President
National Audubon Society

Frederic D. Krupp
Executive Director
Environmental Defense Fund

Michael S. Clark
President
Environmental Policy Institute

Jack Lorenz
Executive Director
Izaak Walton League of America

Michael Fischer
Executive Director
Sierra Club

Paul C. Pritchard
President
National Parks & Conservation Assoc.

George Frampton
President
The Wilderness Society

Cynthia Wilson
Executive Director
Friends of the Earth

THE SECRETARY OF THE INTERIOR

WASHINGTON

June 4, 1987

Honorable Timothy E. Wirth
United States Senate
Washington, D.C. 20510

Dear Senator Wirth:

Thank you for inquiring about my position regarding chlorofluorocarbons (CFCs) and stratospheric ozone, and thank you very much for questioning whether statements attributed to me in press reports were true. They were not.

I have not suggested and do not believe that the complex issues concerning effects of stratospheric ozone depletion should be or could be solved by some simplistic approach such as sunglasses, hats and lotions.

In essence, the basic issue is whether the President merely will be presented with a proposal which simply authorizes negotiating "the best possible" international agreement on the subject, or whether he should have the opportunity to establish for our negotiators meaningful guidelines which indicate such things as how many countries must sign, what percentage of global CFC production and/or use must come under the agreement, which chemicals must be included, and the like in order for an agreement to be acceptable to the United States. Certainly, unilateral action by the United States would do little to address the problem and would be to our disadvantage.

This issue currently is before the President's Domestic Policy Council (DPC). Let me elaborate on some of its aspects.

The purpose of DPC consideration is to be sure that, upon the considered advice of his entire Cabinet, the President, rather than just one or two agencies or departments, is afforded the opportunity to pass judgment on the position to be taken by the United States Government during international negotiations concerning possible limitations on global production and use of CFCs and similar chemicals. This is a complex issue of potentially great significance to the American people, their health, their lifestyle, their environment and their economy. It is the DPC's responsibility to subject available scientific information to thoughtful review and to present to the President an array of responsible options concerning the negotiating position of our government.

Contrary to certain press reports, I have not yet decided for myself what options are worthy of consideration by the President, much less what the preferred option should be. Data and analysis on the multi-faceted aspects of the issue still are being developed on an inter-agency staff basis for DPC consideration. Once such information is available, the DPC members, including myself, will be in a position to reflect on a preferred array of options and then discuss our views with the President.

I am quite disturbed by those who carelessly or deliberately provided the misinformation concerning my views which resulted in the erroneous press reports regarding this matter. The potential impact of CFCs and similar chemicals upon stratospheric ozone and the potential consequences of such impacts, and of possible measures to avoid or mitigate such impacts, upon the lives of millions of Americans, not to mention other countries' citizens, are very serious issues which deserve thoughtful evaluation at the highest levels of our government. The manner in which the matter has been characterized by those, who, it appears, are determined to confine the President's options to those only of their crafting, has the unfortunate tendency to trivialize legitimate concerns and to inhibit informed analysis and policy making.

I believe the threshold question to be dealt with is: what is our objective? Are we attempting to deal with a potentially serious health problem, or is the proposed strategy of limiting production and use of CFCs also aimed at other types of potential problems? The essential thrust of the answer so far has been that our primary concern is potential adverse impact on people's health, specifically, skin cancer. Once that threshold question is finally resolved, we must tackle the who, what, when and how questions.

First, if the scientific theories are accurate, then the problem is one that we as a Nation must seek to solve through international cooperation. We must convince a substantial portion of the rest of the world that this is a problem which must be dealt with and solved on a global basis. A negotiating objective of obtaining agreement from "as many nations as possible" could be meaningless if, in our zeal to reach an agreement, we enter a pact which, for example, does not bind those nations which now and prospectively are likely to be significant producers and/or users of CFCs and similar chemicals. My information is that, at the last set of international negotiations in Geneva, which were conducted under the auspices of the United Nations Environment Program (UNEP), less than one-third of the United Nations member countries were represented, and several emerging industrial nations, such as South Korea, Taiwan, the People's Republic of China, India, Singapore, and Pakistan, were not present. The Soviet Union was the only Eastern Bloc nation present. In my view, it would be foolhardy for the United States to limit domestic production and use of CFCs, only to be confronted with global ozone depletion caused by other nations' continuing to enjoy unfettered CFC production and use.

It should be noted that United States leadership on this issue has brought increasing support from other countries, but the President should be given the opportunity to consider to what extent that leadership might cease to be effective if the United States alone, or in concert with only relatively few other producing and consuming countries, entered into a CFC limitation program. The President should be able to consider what constitutes sufficient, assured participation by other nations before any agreement receives our government's approval.

Secondly, we must have a well-thought out proposal which, while designed to protect American interests, will gain acceptance by other countries, with de minimis exceptions, if any. No longer can the United States merely make assertions and arm-twist the world community into agreement and compliance. Our facts, data, and analysis must be credible, so that our arguments will be convincing. We should base our proposals on a realistic understanding of when CFC substitutes will be available in commercial quantities, the cost to our society to adapt to them, and whether they will be safe from a health and environmental standpoint.

If the theories which underlie our concerns about CFCs are accurate, then the burden is on those who would not insist on all chlorine-emitting CFCs,' as distinguished from just a few, being subjected to international limitations. You will note from the enclosed copy of the "Chairman's Text," which emerged from the Geneva negotiations, that only three CFCs were agreed upon, two (indicated by parentheses) were discussed but not agreed upon, and halons (believed to be powerful emitters of ozone-depleting chlorine) were not included at all. I am advised that it is unclear whether Japan will agree to limitations on CFC 113, which is used as an effective cleansing agent for computer chips.

It is important to determine whether and to what extent an international agreement in some way will give "credit" to the United States for its 1978 unilateral ban on "non-essential" aerosol sprays containing CFCs. Since, as mentioned above, substantially all the countries of the world, developed and developing, should be bound by the agreement, the President has to determine whether to accept the suggestions of some that developing countries be excused from the same level of restrictions as are being proposed for the United States.

Certainly, any international agreement should assure that compliance by each signatory is mutual and verifiable. We also need to know whether this Nation, which is committed to the concept of free international trade, will support, as has been suggested by some, trade sanctions against countries which do not adhere to the obligations imposed by an international agreement.

Thirdly, we must have an acceptable mechanism for future decisionmaking. No plan should be put forward which, regardless of good intentions today, in effect-precludes basing the international regulatory actions of the future on serious scientific review. To create today regulatory "targets" which are to obtain five to twelve years from now, based on the modelling of today which admittedly is plagued by uncertainties and which certainly will change after the proposed "freeze" has been in effect for two years, is highly questionable policy. It seems logical to me that there should be adequate time between the proposed "freeze" and the scientific review contemplated by the "Chairman's Text" to enable signatories to ascertain and to evaluate new scientific, technological and medical information before the decision is made to move forward to the next targeted reduction; otherwise, the "scientific review" could be meaningless.

Moreover, any international agreement which provides for future regulatory decisions by vote of signatories should be designed so as not to leave the United States wholly subject to the voting power of other nations whose economic and political objectives may be entirely inconsistent with our own. Before we agree to an international protocol, perhaps it would make sense to have a pretty good idea as to how the domestic regulatory mechanism would allocate among U.S. producers and users of CFCs and similar chemicals the burden of contributing to internationally agreed-upon "freezes" or reductions in their production and use.

The foregoing are but some of the major facets of this complex issue. Neither the Domestic Policy Council nor the President has had an opportunity to address them, notwithstanding the fact that there is divergence of opinion among interested departments and agencies as to the nature and scope of an agreement that will be in the best interests of the people of the United States. Yet, it is reported that those involved in the negotiating process already have scheduled signing of the international agreement at a planned September meeting in Montreal. The President should not be presented with a fait accompli. The Nation and he deserve better.

I believe that, with well-documented information, a scientifically based review process and creative thinking, this issue can be dealt with by the world community in a rational way for the good of all.

Thank you for the opportunity to respond to your interest.

Sincerely,

Don Hodel

DONALD PAUL HODEL

cc: Chairman Bennett Johnston
Ranking Minority Member McClure

CHAIRMAN'S TEXT

Distr.
RESTRICTED

UNEP/WG.172/CRP.8/Rev.1
30 April 1987

Original: ENGLISH

Ad Hoc Working Group of Legal and Technical Experts for the Preparation of a Protocol on Chlorofluorocarbons to the Vienna Convention for the Protection of the Ozone Layer (Vienna Group)

Third Session
Geneva, 27-30 April 1987

TEXT PREPARED BY A SMALL SUB-WORKING GROUP OF HEAD OF DELEGATIONS

ARTICLE II: CONTROL MEASURES

1. Each party, under the jurisdiction of which CFC 11, CFC 12, CFC 113, (CFC 114, CFC 115) are produced shall ensure that within (2) years after the entry into force of this Protocol the (combined annual production and imports) (combined adjusted annual production) of these substances do not exceed their 1986 level.

2. Each party, under the jurisdiction of which substances referred to in paragraph 1 are not produced at the time of the entry into force of this Protocol, shall ensure that within (2) years from the entry into force of this Protocol (its combined annual production and imports) (its combined adjusted annual production) do not exceed the levels of imports in 1986.

3. Each party shall ensure, that within (4) years after the entry into force of this Protocol levels of substances referred to in paragraph 1 attained in accordance with paragraphs 1 and 2 will be reduced by 20 per cent.

4. Each party shall ensure that within (6) (a), (8) (b) years after the entry into force of this Protocol, the 1986 levels of substances referred to in paragraphs 1 and 2 will be further reduced (by 30 per cent), (a) (if the majority of the parties so decide, (b) (unless parties by a two-third majority otherwise decide), in the light of assessments referred to in Article III, such decision should be taken not later than (2) (4) years after entry into force.

5. Parties shall decide by (two-third majority) (a majority vote)

- whether substances should be added to or removed from the reduction schedule
- whether further reductions of 1986 levels should be undertaken (with the objective of eventual elimination of these substances).

These decisions shall be based on the assessments referred to in Article III.

Note: A second paragraph reading as follows has to be added to Article III. Beginning 1990, and every four years thereafter, the parties shall review the control measures provided for in Article II. At least one year before each of these reviews, the parties shall convene a panel of scientific experts, with composition and terms of reference determined by the parties, to review advances in scientific understanding of modification of the ozone layer, and the potential health, environmental and climatic effects of such modification.

THE WHITE HOUSE

WASHINGTON

June 10, 1987

MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

FROM: RALPH C. BLEDSOE

SUBJECT: Domestic Policy Council Meeting on June 11, 1987

Attached are an agenda and materials for the Domestic Policy Council meeting scheduled for Thursday, June 11, 1987 at 11:00 a.m. in the Roosevelt Room. The agenda item to be discussed is Stratospheric Ozone.

This will be a continuation of the discussion at the May 20 meeting, at which additional information was requested on the legal and legislative, health, climatic, and cost/benefit aspects of this issue. The attached paper contains a brief description of these, and includes additional points for discussion about the U.S. positions that should be taken during the international negotiations.

Attachments

THE WHITE HOUSE

WASHINGTON

DOMESTIC POLICY COUNCIL

Thursday, June 11, 1987

11:00 a.m.

Roosevelt Room

AGENDA

1. Stratospheric Ozone -- Lee M. Thomas
Administrator
Environmental Protection Agency

Beryl W. Sprinkel
Chairman
Council of Economic Advisers

THE WHITE HOUSE

WASHINGTON

June 10, 1987

MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

FROM: THE ENERGY, NATURAL RESOURCES & ENVIRONMENT WORKING GROUP

SUBJECT: Stratospheric Ozone

On May 20, 1987, the Council met to discuss the international protocol negotiations currently underway to limit emissions of ozone depleting chemicals. Several questions were raised and the Working Group was asked to provide answers. The questions were:

* What are the legislative and legal impacts of an international ozone protocol?

* What are the most up-to-date scientific data on climatic and health effects of ozone depletion?

* What is the cost/benefit effect of an international protocol restricting ozone depleting chemicals?

The following has been summarized by the Working Group after discussion of detailed presentations by experts in each area.

Climatic and Atmospheric

o Since 1960 the natural variability of the total global column of ozone has been about 3%.

o Observations have shown (1) a decrease in ozone of about 7% during the last decade in the upper part of the stratosphere; and (2) a 40% decrease in total column ozone over Antarctica in the spring season since the mid-1970's. Whether the recent changes in column and upper stratospheric ozone are due to natural phenomena or in part to CFCs remains an open question.

o Continued growth of CFC and Halon emissions at 3% per year is predicted to yield a globally averaged ozone depletion of 6% by the year 2040, and more thereafter, which would be greater than natural variability. In contrast, a true global freeze on emissions of CFCs and Halons (i.e. full international participation, full chemical coverage, and full compliance) is predicted to yield a maximum global average column ozone depletion of less than 1%. Ozone depletions at high latitudes are predicted to be 2-3 times larger than the global average.

o A true global freeze would limit column ozone depletion to less than the natural variability. A protocol freeze would fall short of a true global freeze as it would have less than

full compliance among developed countries and would most likely allow for limited growth in CFC usage in developing countries.

- Ozone depletion in the upper part of the stratosphere greater than 25% is predicted to occur even in the case of a true global freeze. This would lead to a local cooling greater than natural variability. The consequences of this cooling for the earth's climate cannot be predicted at this time.

- There is an uncertainty factor of two to three in the predictive abilities of the theoretical models used to simulate the present atmosphere.

- If there is environmental damage due to CFCs and Halons, their long atmospheric lifetimes would mean that recovery would take many decades even after complete cessation of emissions.

Health and Ecological Effects

- Projected ozone depletion will increase health effects of ultraviolet radiation (UVB)

  -- Without ozone depletion, projections show UVB is a serious problem, and will cause:
  - 2,977,000 skin cancer deaths of Americans born before 2075,
  - 165 million skin cancer cases,
  - 426,516,000 cataracts.

  -- If the predicted 25% depletion of ozone in the upper stratosphere occurs by 2075, UVB related health effects would increase by:

  - 2 million additional skin cancer deaths,
  - 98 million additional skin cancer cases,
  - 43 million additional cataracts.

  -- If upper stratospheric depletion of 7.7% occurs instead (as predicted to result from a protocol freeze with less than full compliance and limited emissions growth in developing countries),

  - 1.6 million additional American deaths would be averted,
  - 79 million additional skin cancer cases would be averted,
  - 32 million additional cataracts would be averted.

  -- If upper stratospheric depletion of 6.1% occurs (as predicted to result from a 20% emissions reduction protocol with less than full compliance and limited emissions growth in developing countries) incrementally,

  - 80,000 additional American deaths would be averted,
  - 4 million additional skin cancer cases would be averted,

- 2 million additional cataracts would be averted.

-- If upper stratospheric depletion of 3.2% occurs (as predicted to result from a 50% emissions reduction protocol with less than full compliance and limited emissions growth in developing countries) incrementally,

- 130 thousand additional American deaths would be averted,
- 7 million additional skin cancer cases would be averted,
- 7 million additional cataracts would be averted.

-- Uncertainties include future ozone depletion, the action spectra and estimates of dose-response coefficients.

- The analysis assumes no behavioral changes.
- Considering quantifiable uncertainties, there is a 50% chance that the actual damages will be between 50% and 125% of the above estimates.
- There is a 90% chance that the actual damages will be between 20% and 260% of the above estimates.

-- Laboratory studies link UVB with suppression of the immune system.

- Evidence suggests a relationship to infectious disease.
- A relationship has been demonstrated in herpes simplex and the tropical disease, leishmanias.

o Evidence supports the conclusion that ozone depletion would exacerbate existing environmental problems.

-- Photochemical air pollution in places like Los Angeles would probably worsen.

-- The lifetime of outdoor plastics and latex paints would be shortened.

o Evidence supports the conclusion that ozone depletion could seriously influence crops and aquatics.

-- Knowledge is limited, but experimental data indicate crop production may be reduced and ecosystems disturbed.

-- Field experiments have not been done, but laboratory data indicate aquatic organisms are sensitive to higher UVB, especially during critical breeding seasons.

o Higher emissions of CFCs and its indirect effects of vertical ozone re-distribution will raise global temperatures and change climate.

Cost/Benefit

- Cost/benefit analysis has been carried out for known health effects (skin cancern deaths, non-fatal skin cancers, cataracts) based on EPA's Risk Assessment.

- Potential effects of ozone depletion on plants, aquatic life, the human immune system, ground-level ozone concentrations, polymer degradation, and sea level rise were not quantified.

- A range of assumptions were used in the analysis to reflect economic uncertainties and lack of inter-agency consensus on the values of key parameters.

- The analysis is based on EPA models which attempt to project health impacts through year 2165 and assume no changes in technology, medicine or human behavior.

- Conclusions:

  -- The economic benefits from a protocol freeze (at 1986 levels with less than full international participation) of CFC emissions are substantially greater than the costs over all plausible assumptions and ranges of uncertainty.

  -- The economic benefits of a protocol freeze plus a 20% reduction in CFC emissions are also in almost all cases substantially in excess of the costs.

  -- The incremental benefits of the additional 20% reduction beyond the freeze are in most cases in excess of the incremental costs of the cut.

  -- The benefits of an additional 30% reduction (beyond the freeze plus 20% reduction) appear in some cases to be greater than the incremental costs, and in other cases to be less. Further scientific, technical, and economic review will be valuable in evaluating benefits and costs before implementing this step.

ISSUES AND DISCUSSION

At the May 20 Council meeting, the status of the international ozone negotiations was provided. It included a review of the November 28, 1986 Circular 175, which was approved by Under Secretary of State Allen Wallis, and which authorized the U.S. delegation to negotiate a protocol. The approval process for the Circular 175 has been criticized by some members of the Working Group, on the basis that numerous departments and agencies had not concurred on the Circular, or that concurrence was by individuals not at policy-making levels. The Circular 175 authorized

the U.S. delegation to negotiate a protocol providing for:

I. A near-term freeze on the combined emissions of the most ozone-depleting substances;

II. A long-term scheduled reduction of emissions of these chemicals down to the point of eliminating emissions from all but limited uses for which no substitutes are commercially available (such reduction could be as much as 95%), subject to III; and

III. Periodic review of the protocol provisions based upon regular assessment of the science. The review could remove or add chemicals, or change the schedule or the emission reduction target.

The international negotiations to date have resulted in a Chairman's Text, a proposed protocol to which negotiating countries have been asked to respond.

The Working Group recommends that the Council support continuation of negotiations pursuant to the current Circular 175. The Working Group also recommends however, that additional guidance be given to the U.S. negotiators, based on reviews by a wider range of agencies such as those represented on the Council.

The following are issues for which the Working Group feels additional guidance to the negotiators may be appropriate.

A. PARTICIPATION AND TRADE PROVISIONS

There are many complex issues pertaining to fair trade provisions and participation of developing countries in the protocol.

1. What should be the U.S. position regarding international participation in the protocol?

The Working Group feels that the U.S. delegation should seek maximum international participation in the protocol. To many, participation is the key issue, because growth of emissions from non-participating countries would offset the emissions reductions of those who are parties to the protocol, thereby hindering overall attainment of protocol objectives.

Developing countries are an important part of the participation issue. While the 48 countries participating in the protocol negotiations account for over 90% of the current production, substantial growth of production and consumption is anticipated in developing countries. The U.S. and the United Nations Environment Program (UNEP) have expended considerable effort to encourage broad participation by developing countries. However, only relatively few have shown the interest or the expertise to participate. Parties to the protocol would not be able to prevent non-joining countries from producing CFCs for their

internal market or from exporting to other non-parties, but, if the protocol provides for trade sanctions, parties could prevent non-parties from profiting through international trade with protocol parties.

A strong protocol, including the major producing and consuming countries, should lead to earlier development of substitute products, and might discourage non-joiners from investing heavily in CFC technology that would not generate trade with parties to the protocol. Further, some believe that the very existence of a protocol, as an expression of concern by the international community, increases the pressure on non-member countries to join; in essence, if they continue to produce CFCs, they are exposed as behaving irresponsibly on a matter of global import.

The following options are proposed for the Council's consideration:

a. Give the U.S. delegation discretion for seeking maximum participation.

b. Develop criteria for acceptable levels of participation, e.g. minimum participation of countries producing a specified percentage of the total global CFC/Halon production; or a formula requiring minimum participation of countries accounting for a specified portion of the world population.

c. Wait to reassess the U.S. position after we know the extent of participation by other countries.

To encourage the participation of developing countries, some parties favor granting developing countries a limited grace period from compliance with protocol provisions. Such a grace period would be allowed in recognition of the importance of having global participation in the 21st century, and in recognition of the fact that developing countries have not received the benefits of CFC and Halon use. The length of the grace period and the levels of production/consumption that would be permitted are questions that would need to be resolved.

2. Voting among parties to the protocol.

Also at issue is the voting process for making future decisions under the protocol. This could include decisions on future reductions. The Working Group recommends that the U.S. delegation negotiate for a system of voting which would give due weight to the major producing and consuming countries.

3. The control formula and trade provisions

The Working Group recommends that the Council direct the U.S. delegation to continue to seek to include in the protocol an effective formula to control emissions with accountability, the

fewest possible restrictions on the flow of trade and capital among parties, the most favorable formula for U.S. industry, stimulation of substitutes and innovative emission controls, and with no greater restriction on trade involving the U.S. than will be adopted and enforced by other nations.

Trade: The U.S. has pushed for a strong protocol article on trade sanctions to be imposed on parties which have not signed the protocol. This would limit imports not only of the controlled chemicals but also of products containing these chemicals (e.g., air conditioners or foam insulation). The U.S. has pushed for a study of the feasibility of limiting imports of products manufactured using the controlled chemicals (e.g., electronic equipment). The intent of the trade article would be to provide a "stick" for encouraging others to join and to limit the impact on ozone depletion and the transfer of commercial benefits from parties to the protocol to countries which have not joined.

This would represent a major policy decision, as it could be an important precedent for using trade sanctions to enforce environmental regulations. Also to be decided is whether trade sanctions should be applicable to parties who materially violate their protocol obligations.

Control Formula: Since it is not possible to measure emissions directly, the negotiators have explored alternative formulas to control emissions which consider production, consumption, imports and destruction.

4. Should the U.S. seek protocol provisions for reporting, monitoring, verification and enforcement provisions?

There are many complex issues relating to enforcement of a protocol. Because of the enforcement roles of EPA and U.S. environmental groups, our compliance with the protocol is apt to be substantial. Most other nations do not have such enforcement mechanisms. No monitoring or verification system has been identified to date. A system of on-site inspections for the presence of new or expanded CFC-producing facilities would be expensive and probably ineffective because of the large land areas involved.

Some Working Group members believe the U.S. should insist upon strong monitoring and reporting provisions in a protocol. Some favor the U.S. negotiating for strong provisions, and exploring the feasibility and cost effectiveness of establishing ad hoc inspection teams to investigate any alleged violations of protocol requirements. Trade provisions could at least prevent entry of such production into international trade with parties to the protocol.

The following options are presented for the Council's consideration:

a. Give the U.S. delegation discretion for seeking such provisions.

b. Insist that the protocol include such provisions.

5. Should the U.S. attempt to receive "credit" for its 1978 unilateral voluntary ban on CFC-producing non-essential aerosols?

Some believe that in addition to a freeze, other nations should ban non-essential aerosols as the U.S. did in 1978. Otherwise, many nations might be able to meet their obligation to reduce CFC emissions through the simple expedient of banning such aerosols, while the U.S. is required to cut back on other products using CFCs. One form of recognition may be to require other countries to ban non-essential aerosols in addition to meeting other protocol requirements.

The U.S. attempted unsuccessfully to get such credit two years ago during the negotiation of the Vienna Convention on the ozone layer, and some believe that if the U.S. were to insist upon such credit as a condition of a protocol, the negotiations would come to a standstill as in 1985. Some argue that even with the aerosol ban, the U.S. remains responsible for most of the long-lived CFCs in the stratosphere, and the U.S. per capita CFC consumption is still the world's highest.

The Working Group recommends that the Council consider and provide guidance for the U.S. delegation as to whether or not we should attempt to gain credit for our previous actions.

B. AN EMISSIONS CONTROL PROTOCOL

The aforementioned Chairman's Text contains proposals related to (1) a freeze on emissions, and (2) emissions reductions beyond a freeze. The Working Group discussed these at length.

1. A Freeze on Emissions. The following are major questions:

a. What chemicals should the freeze cover?

The Chairman's Text provides for a freeze on emissions at 1986 levels which would cover CFCs 11, 12, 113, 114, and 115. Due to a technicality, Halons are not now included.

The Working Group consensus is that the freeze should include all of these CFCs as well as Halons 1201 and 1311. The U.S. delegation will be seeking to expand the protocol to include the Halons.

From a purely scientific perspective all chemicals containing chlorine and bromine, weighted by the ozone depleting potential, should be considered for the protocol, both for the freeze and for potential future reductions. The Chairman's Text is somewhat less than a purely scientific perspective because only the fully halogenated chemicals (CFCs 11, 12, 113, 114 and 115, and Halons 1201 and 1311) are being considered for inclusion. Chemicals such as CFC 22 and methyl chloroform which are only partially halogenated are not being considered as they are believed to be part of the solution and have relatively low ozone depleting potential.

Concern has been raised with regards to reductions in Halons 1201 and 1311 and CFC 113 because of their strategic value to the U.S., and the apparent lack of suitable substitutes. This is a legitimate concern but one that can be handled if controls are on the sum of the ozone depleting potential of all chemicals, rather than on individual substances. This will allow each individual country the flexibility to live within the internationally agreed protocol with the least interference on how a country wants to implement the protocol.

b. When should a freeze on emissions occur?

The Chairman's Text proposes that the freeze take effect within two years of entry into force. There is uncertainty as to when entry into force will occur, but the best estimate is that it will be in the 1988-90 time period. The Working Group consensus is that a freeze on emissions should go into effect within one to two years after entry into force of the protocol.

2. Reductions Beyond a Freeze

a. What chemicals should the reductions cover?

The Chairman's Text proposes that the additional reductions beyond a freeze include CFCs 11, 12, 113, 114 and 115. The Working Group consensus is that any additional reductions should cover CFCs 11 and 12; however, there are questions about the coverage of CFCs 113, 114, 115, and Halons 1201 and 1311. National security concerns argue against including the Halons in any reductions. There is also a national defense and security concern with including CFC 113 in any reductions beyond a freeze, especially given 113's importance for certain high-technology electrical applications. The questions regarding coverage of CFCs 114 and 115 concern their potential use as substitutes for controlled chemicals and their present low usage.

b. How much and when?

The Chairman's Text provides for a 20% reduction to take effect 4 years after entry into force (1992-94) and an additional 30% reduction to take effect either 6 years (1994-96) or 8 years (1996-98) after entry into force.

With respect to any future reductions, the Working Group recognizes the importance of the future assessments of science, technology, economics and environment.

The Working Group identified distinct issues surrounding each potential reduction. With respect to the 20% reduction, some favor it because it can be accomplished with existing industrial processes and because reductions beyond a freeze may be needed to counterbalance less than full participation in a freeze. Yet others note there are uncertainties as to the need for any additional reductions.

Regarding the additional 30% reduction, some favor its inclusion on the basis of judgements about the science and potential adverse health effects. Others emphasize, however, the uncertainties about the need to commit at this time to this additional measure. One or more scientific reviews would be available prior to this reduction going into effect.

The Working Group recommends that the Council discuss and provide guidance on whether the U.S. position is to support:

1. A 20% reduction beyond a freeze.

2. An additional 30% reduction.

3. Additional reductions beyond 50%.

c. Should the reductions be automatic (subject to reversal by a 2/3 vote) or contingent upon a positive vote of a majority of the parties?

The Chairman's Text proposes an initial 20% reduction to take effect automatically (implicitly reversible by a 2/3 vote).

The Text provides two alternative implementing mechanisms for the next 30% reduction -- 6 years after entry into force if the majority of the parties so decide, or 8 years after entry into force unless reversed by a two-third majority of the parties.

There are strong views in the Working Group on the implementing mechanism for the additional 30% percent reduction. Many do not wish to commit to the reduction at this time unless it is contingent upon a positive vote of a majority of the parties. Others, however, believe the evidence warrants committing to this reduction at this time.

Most believe the future assessments of the science, technology, economics and environment are important to these reduction decisions. There are differing views, however, on how such future assessments ought to factor into reduction decisions. Some believe final reduction decisions ought to follow future

assessments, whereas others believe reductions should be scheduled now with an opportunity for reversal based upon future assessments.

The Working Group recommends that the Council provide guidance on whether the U.S. should support automatic reductions of:

a. 20% beyond the freeze.

b. an additional 30%.

C. ISSUES FOR LATER CONSIDERATION

The Working Group identified several related issues that will require further consideration. They include:

1. The relationship between international protocol and domestic regulations. Since the overall objective of the protocol is to avoid or reduce health and environmental risks, compliance with the international protocol will necessarily result in domestic regulation. There is legal precedent for such a linkage between international agreements and subsequent domestic regulations.

2. Non-Regulatory Approaches. There is no reason why the Nation's efforts to achieve the objectives sought in the protocol should be limited to a regulatory approach. The suggestion has been made that if the government imposes such regulatory burdens upon the people and the economy of the U.S., consideration should also be given to policies which may ease the regulatory burdens, including, but not limited to, possibly rendering unnecessary imposition of regulations beyond those necessary to assure U.S. compliance with the international protocol.

Such a domestic, non-regulatory supplement to the international protocol might, for example, contain elements intended to eliminate government barriers to, or facilitate, the development of: substitutes for covered chemicals, technology to mitigate or eliminate the adverse effects of chemical emissions upon stratospheric ozone, or medical advancements in the understanding and treatment of the problems caused by ozone depletion.

[NOTE: This paper attempts to protray the general flavor of the Working Group discussions on this very complex issue. It was not possible to include all of the important comments contributed by representatives of the participating agencies.]

File

DOMESTIC POLICY COUNCIL

2:00 p.m. May 20

RE: Stratospheric Ozone

THE WHITE HOUSE

WASHINGTON

May 18, 1987

MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

FROM: ROBERT W. SWEET, JR.
Deputy Executive Secretary

SUBJECT: Domestic Policy Council Meeting of May 20

Attached are an agenda and materials for the Domestic Policy Council meeting scheduled for Wednesday, May 20, 1987 at 2:00 p.m. in the Roosevelt Room. The agenda item for discussion is stratospheric ozone.

The Council will be briefed on international negotiations now underway, and problems associated with reducing depletion of stratospheric ozone. Guidance will be sought from the Council on U.S. positions for various aspects of the problem. A paper containing background information and a summary of the issue areas is attached.

Attachment

THE WHITE HOUSE

WASHINGTON

DOMESTIC POLICY COUNCIL

Wednesday, May 20, 1987

2:00 p.m.

Roosevelt Room

AGENDA

1. Stratospheric Ozone -- Ambassador Richard E. Benedick
Deputy Assistant Secretary,
Environment, Health & Natural
Resources
Department of State

THE WHITE HOUSE

WASHINGTON

May 18, 1987

MEMORANDUM FOR THE DOMESTIC POLICY COUNCIL

FROM: THE ENERGY, NATURAL RESOURCES & ENVIRONMENT WORKING GROUP

SUBJECT: Stratospheric Ozone Protocol Negotiations

Issue - What should the U.S. negotiating position be for elements of the protocol to protect the stratospheric ozone layer by controlling emissions of ozone-depleting substances [chlorofluorocarbons (CFC) and halons]?

Background - The Environmental Protection Agency, under terms of a court order resulting from a lawsuit by the National Resources Defense Council against the EPA Administrator, must publish in the Federal Register by December 1, 1987, a proposed decision on whether there is a need need for further domestic regulations, under the Clean Air Act, of chemicals which deplete the stratospheric ozone layer. These chemicals [certain chlorofluorocarbons (CFCs) and halons] are used for solvents, refrigerants, foam blowing, fire extinguising agents, sterilants, aerosol propellants, and other miscellaneous uses.

Compared to other environmental laws, the Act sets a low threshhold for required action by EPA. Because of the global nature of the problem of ozone depletion, however, unilateral U.S. regulatory action would not be effective in protecting the ozone layer. An important U.S. objective in attaining an early and effective international agreement on ozone is also to avoid disadvantages to U.S. industry resulting from unilateral U.S. action required by the Clean Air Act.

The U.S. has been participating in international negotiations since 1983 on this subject, leading to the 1985 Vienna Convention on Protection of the Ozone Layer. Negotiations on a protocol to this Convention resumed in December, 1986, following intensive international scientific and economic assessments. Since December, there have been two further sessions, in February and April, 1987, and the protocol is scheduled for signing in September, 1987 in Montreal.

The objectives for the U.S. Government are in State Department Circular 175 of November 28, 1986. These objectives include:

(a) a near-term freeze on the combined emissions of the most ozone-depleting CFC and halon substances;

(b) long-term scheduled reduction of emissions of these chemicals down to the point of eliminating emissions from all but limited uses for which no substitutes are commercially available (could be as much as 95%), subject to (c); and

(c) periodic review of the protocol provisions based upon regular assessment of science, technology, environmental and economic (STEE) elements, which could remove or add chemicals, or change the schedule or the emission reduction target.

The Working Group on Energy, Natural Resources and the Environment has considered the issue of stratospheric ozone depletion over the past several months. Attached is a paper prepared by OMB that summarizes the available scientific, environmental, economic, and international data.

Discussion - Since the negotiations are now reaching a stage where final positions are being proposed, and due to the broad economic impact of these positions, several Cabinet agencies have asked that the Domestic Policy Council review the U.S. position and give guidance to the U.S. negotiating team on several elements of our position prior to the next negotiations.

Representatives of key countries, including the U.S., will meet on June 29 and at subsequent sessions to discuss a suggested text (attached) for a control schedule prepared by the Chairman of the April negotiation sessions (referred to as the Chairman's text). At that time they will address the chemicals to be covered, the timing and stringency of the controls, and the relationship of scientific assessments to this process. Following these meetings, the Council will be informed, and asked for further guidance on the U.S. final position prior to the formal negotiating meeting on September 8, 1987, and a ministerial endorsement meeting September 16-20, 1987.

DPC Guidance - General DPC guidance is sought on the following issues:

1. Chemical Coverage

-- The U.S. objective is to achieve the broadest coverage of major ozone depleters on a weighted basis, including fully halogenated CFCs and halons.

-- The European Community, Japan, and the USSR wanted only CFC 11 and 12 covered; but now may agree that CFC 113, 114, 115 and halons could be included if UNEP, in its June meeting, agrees that the Convention can include them.

-- Options include seeking differential coverage, i.e. reducing some and only freezing others. There is support

for freezing but not reducing halons, given its defense uses.

-- There is general interagency agreement on chemical coverage. The negotiating team will press for the broadest attainable coverage in the freeze, subject to DPC guidance.

2. Stringency and Timing of Controls; Relationship to Periodic Assessments

-- Key issues are:

o Stringency: Should there be an initial freeze and subsequent reductions? What should the reduction levels be, and in what timing and increments? What would be the probable effect on the ozone layer?

o Timing: There are environmental benefits for early action to reduce CFC's; further, it would encourage industry to develop CFC substitutes. Given that a required reduction is likely, there is a need to provide time for industrial product development adjustment. Some in industry prefer a definite decision and advance notice. This conflicts with those who prefer to delay positive action as long as possible.

o Relationship to periodic reassessments of scientific, technological, environmental and economic (STEE) factors scheduled in the protocol: Should we go for (1) planned reductions subject to reversal by vote of parties after reassessment, or (2) target levels to be implemented only by positive vote after reassessment, or (3) no targeted reductions?

-- The Chairman's text, released after the last negotiating session in April 1987, represents a possible emerging international consensus and is a convenient vehicle for review. It includes:

o Freeze at 1986 levels of production/consumption of CFC 11, 12, 113, [114, 115] within two years after entry into force (EIF) of the protocol. This could happen in 1988, but the most likely EIF date is 1990.

o An automatic 20% reduction 4 years after EIF. Likely date 1994.

o Additional 30% reduction, to be implemented after scheduled STEE reassessment, with two options:

(1) 6 years after EIF (likely date 1996), if positively confirmed by majority vote of parties, or

(2) 8 years after EIF (likely date 1998), unless reversed by two-thirds vote of parties.

o Additional steps down to possible eventual elimination of these chemicals for all but limited uses would be decided subsequently by parties based on periodic reassessments.

Questions for Decision: Should U.S. delegation seek agreement along lines of chairman's text, work for greater stringency/earlier impact, or propose some relaxation in terms?

(a) Freeze. Interagency accord, within 1-2 years of EIF. Some prefer an earlier freeze.

(b) 20% reduction. Some agencies feel implementation should require positive vote of parties following a STEE reassessment in 1990.

(c) Additional 30% reduction. There is interagency disagreement here on several elements.

-- Should a set level of reduction beyond the first 20% be scheduled; if so, at what level?

-- Should a second reduction be 6 years after EIF and be subject to a positive vote, or be 8 years after EIF and be subject to a reversal vote, or some other variant?

(d) Additional reduction steps. Should the delegation press for further reductions as contained in the Chairman's text and Circular 175? If so, at what levels and time frame? Should they require a positive vote or be implemented unless there is a vote for reversal? Alternatively, should the process for setting reductions and timing be specified? Anything beyond the Chairman's text may not be achievable.

3. Control Formula and Trade Provisions:

(A) Trade Among Parties.

Significant differences remain among governments over a formula for regulating controlled chemicals.

o Options include national ceilings on: (a) production; (b) production plus imports, combined or separately; (c) consumption; or, (d) production plus imports, less exports to parties, less amounts destroyed.

- o There is general interagency agreement favoring a ceiling on consumption, or "adjusted production," but compromise may be needed.

- o U.S. objectives include effective control of emissions with accountability, fewest restriction on the flow of trade and captial among parties, and most favorable formula for U.S. industry. Verification remains an issue.

- o Subject to DPC guidance, the delegation will pursue these objectives and seek DPC approval of specific recommendations at a later time.

(B) Trade With Non-Parties.

-- Key elements:

- o General international consensus on:

  -- Ban on imports of controlled chemicals in bulk from non-parties.

- o No international consensus on:

  -- Restrictions on exports of bulk chemicals.

  -- Restrictions on imports of products containing controlled chemicals.

  -- Consideration of restrictions on products made with controlled chemicals.

  -- Consideration of restrictions on export of technology and equipment.

-- U.S. objectives: to regulate trade in order to encourage adherence to protocol and avoid benefits to non-parties at expense of parties. Proposals consistent with GATT.

-- Interagency consensus in favor of strong trade article, including trade in bulk chemicals and products that could be uniformly enforced. Transfer of technology and equipment remains an issue.

-- Subject to DPC guidance, delegation will pursue these objectives and seek DPC approval of specific recommendations at a later time.

4. Participation.

-- U.S. objective: To encourage effective global control through widest possible participation by other countries.

-- **Problem:** The less developed countries (LDCs) need concessions for essential domestic uses to encourage adherence; but exemptions must remain limited to avoid undercutting global control levels. Concessions being considered in the Chairman's text could double global production ceiling if fully used within the period allowed.

-- One option entails exemption from controls for a limited period for LDCs followed by adherence to the protocol. Controls will be needed to restrict production in the LDCs by existing producers.

-- Related problem: Majority LDC membership could control protocol voting to U.S. disadvantage. Should U.S. press for weighted voting based on historic use and production levels? Should elements be put into the protocol?

-- This issue needs more work. Subject to DPC guidance, we will refine our objectives for subsequent negotiations and later seek DPC approval of specific recommendations.

CHAIRMAN'S TEXT

Distr.
RESTRICTED

UNEP/WG.172/CRP.8/Rev.1
30 April 1987

Original: ENGLISH

Ad Hoc Working Group of Legal and Technical
Experts for the Preparation of a
Protocol on Chlorofluorocarbons to
the Vienna Convention for the
Protection of the Ozone Layer (Vienna Group)

Third Session
Geneva, 27-30 April 1987

TEXT PREPARED BY A SMALL SUB-WORKING GROUP OF
HEAD OF DELEGATIONS

ARTICLE II: CONTROL MEASURES

1. Each party, under the jurisdiction of which CFC 11, CFC 12, CFC 113, (CFC 114, CFC 115) are produced shall ensure that within (2) years after the entry into force of this Protocol the (combined annual production and imports) (combined adjusted annual production) of these substances do not exceed their 1986 level.

2. Each party, under the jurisdiction of which substances referred to in paragraph 1 are not produced at the time of the entry into force of this Protocol, shall ensure that within (2) years from the entry into force of this Protocol (its combined annual production and imports) (its combined adjusted annual production) do not exceed the levels of imports in 1986.

3. Each party shall ensure, that within (4) years after the entry into force of this Protocol levels of substances referred to in paragraph 1 attained in accordance with paragraphs 1 and 2 will be reduced by 20 per cent.

4. Each party shall ensure that within (6) (a), (8) (b) years after the entry into force of this Protocol, the 1986 levels of substances referred to in paragraphs 1 and 2 will be further reduced (by 30 per cent), (a) (if the majority of the parties so decide, (b) (unless parties by a two-third majority otherwise decide), in the light of assessments referred to in Article III, such decision should be taken not later than (2) (4) years after entry into force.

5. Parties shall decide by (two-third majority) (a majority vote)
   - whether substances should be added to or removed from the reduction schedule
   - whether further reductions of 1986 levels should be undertaken (with the objective of eventual elimination of these substances).

These decisions shall be based on the assessments referred to in Article III.

Note: A second paragraph reading as follows has to be added to Article III. Beginning 1990, and every four years thereafter, the parties shall review the control measures provided for in Article II. At least one year before each of these reviews, the parties shall convene a panel of scientific experts, with composition and terms of reference determined by the parties, to review advances in scientific understanding of modification of the ozone layer, and the potential health, environmental and climatic effects of such modification.

BACKGROUND FACTS OZONE ISSUE

THE DEPLETION MECHANISM

Man-made chlorofluorocarbons (CFC's) and halons are compounds widely used in industrial economies. Their lifetimes in the atmosphere are expected to be 75 - 100 years. Eventually, they are transported into the stratosphere and broken apart, by ultraviolet light (UV), into oxides of chlorine and bromine. These act as catalysts, each molecule breaking apart thousands of ozone molecules. The reduction of ozone transmits more UV to the surface.

NUMERICAL PREDICTIONS OF DEPLETION

Chart 1 shows projected depletions for a range of CFC emissions.

Even when predicted changes in total ozone in the column are small and little change occurs in UV reaching the surface, major changes in the vertical distribution of the ozone are still predicted with a potential net warming effect on the climate.

HOW GOOD ARE THE NUMERICAL MODELS

The models are in some conflict with empirical measurements. Measured ozone abundances above 35 km. exceed modeled abundances by as much as 30-50 percent. There are also errors in predicted temperatures, in distributions of odd nitrogen species and other atmospheric chemicals and in model sensitivity to chlorine.

On the other hand, all of the models predicted, within acceptable limits, similar ozone depletions for given CFC scenarios.

ACTUAL TRENDS IN OZONE

Monitoring efforts to measure actual trends in global ozone have produced inconsistent and inconclusive results. Ground-based "Dobson" instruments, in use since 1960 at dozens of stations, show no trend in ozone abundance. A much smaller number of "Umkehr" stations, in use since 1970, and satellite data taken since 1978 show significant decreasing trends in the total ozone column, largely since 1981. Whether the apparent trends are due to satellite sensor-drift, the El Chichon eruption, the 1982 El Nino, changes in solar radiation, or manmade CFC's is not certain. A detailed re-evaluation of these sources of data will be available in late fall, 1987.

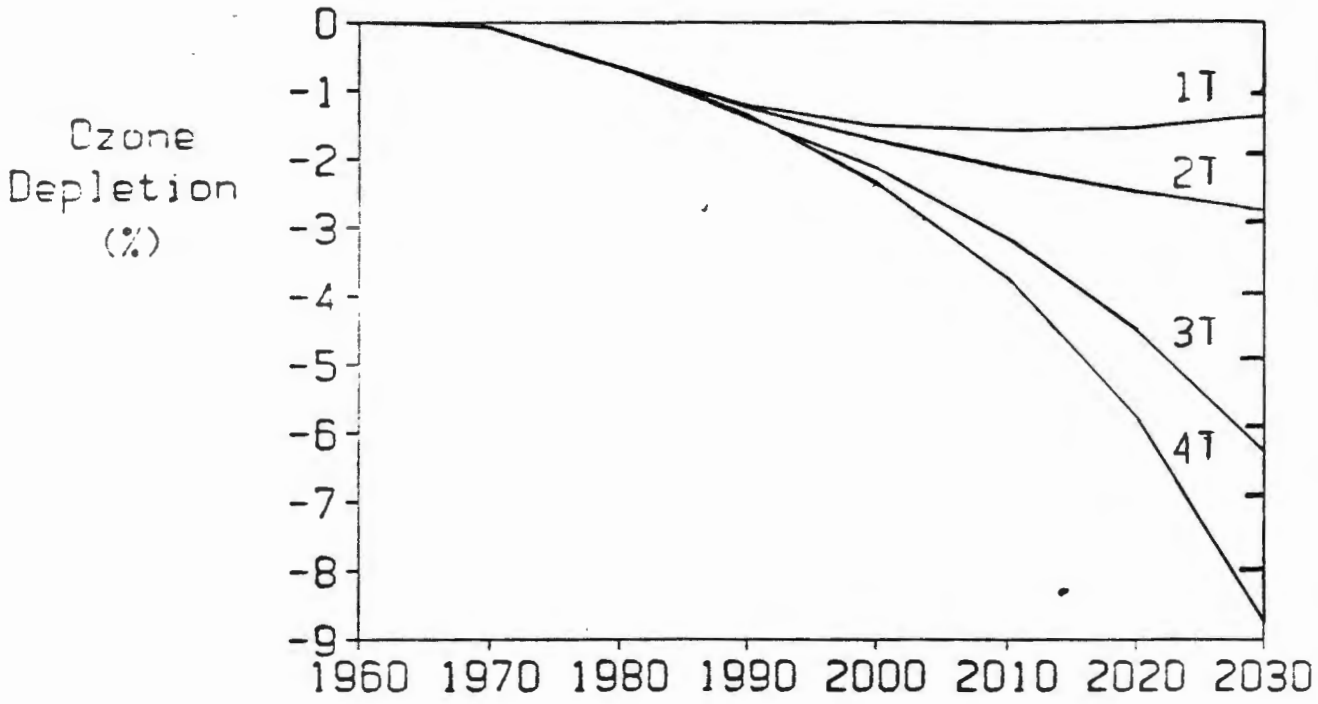
In short, interpretations of the existing satellite and ground-based data on ozone trends range from:

-- No obvious human-caused trends, to

-- Marked downward trends, 2-3X larger than predicted by theory.

Chart 1

Time Dependent Globablly and Seasonally Averaged Changes in Ozone for Coupled Perturbations (IS 2-D Model)



Results show for four scenarios of trace gas growth:

Scenario	CFC-11 and CFC-12
1T	1980 levels
2T	1.2% growth
3T	3.0% growth
4T	3.8% growth

Assumptions for other trace gases are the same in each scenario: constant emissions of CFC-113, CC14, and CH3CC13, zero emissions of halons, one percent growth per year in CH4, and 0.25 percent growth per year in N2O. CO2 concentrations grow at 0.5 percent.

Source: Stordal and Isaksen, (1986).

THE ANTARCTIC OZONE "HOLE"

It was discovered in 1985 that, since about 1965, in the Antarctic spring, and only in the spring, overhead ozone has increased in a ring around, and decreased directly above Antarctica. This seasonally temporary depletion has been more and more each year and now amounts to 40-50 percent of the ozone, approximately offset by the build-up in the ring. It was totally unanticipated by the existing science and models.

The global implications, if any, of the "hole" are currently unknown since the cause is not established. The existing observations could be consistent with but are not proof of the man-made chlorine hypothesis.

EFFECTS OF OZONE DEPLETION

Ozone depletion has a number of potential adverse impacts as follows. Except possibly for skin cancer, the level of depletion needed to cause significant adverse effects is unknown.

Skin Cancer Effects. Prolonged sun exposure is considered to be the dominant risk factor for non-melanoma skin tumors. However, uncertainty exists in the actual doses received by populations and in the changes in response which would result from changes in dose. Changes in behavior have tended to increase skin cancer incidence and mortality, which, therefore, could be reduced by changes in behavior.

In the U.S. there are more than 400,000 non-melanoma skin cancer cases each year with about 4000 deaths. Table 1 shows the range of estimates of increase from a 2 percent depletion for San Francisco. Worldwide growth of CFC emission of 1 percent annually is estimated to cause a 2 percent depletion by about the year 2010.

Table 1.

Type	Current Cases, %	Current Deaths, %	Increase in Incidence, % Male	Female
Basal Cell	71	20-25	2.1 - 7.2	0.7 - 5.0
Squamous Cell	29	75-80	3.2 - 11.7	3.1 - 13.3

The non-melanoma skin cancer effects of ozone depletion are not likely to be given great weight in developing countries wishing to use CFC's -- skin pigmentation is a protective barrier that reduces the incidence of such tumors.

Much circumstantial evidence implicates solar radiation as one of the causes of cutaneous malignant melanoma (CMM), with 25,000 cases and 5,000 deaths in the U. S. in 1985. On the other hand, some studies find no correlation between incidence and latitude, and outdoor workers have lower CMM rates than indoor workers.

EPA's estimate is that each 1 percent ozone depletion would increase incidence by 1-2 percent and deaths by 0.8-1.5 percent.

Immune System Effects. Solar radiation has been found to have a detrimental effect on the immune system of both humans and animals. Although the mechanisms are not fully understood, it is clear that the UV part of the spectrum, which is screened out by ozone, is responsible.

Plant Life Effects. Existing knowledge of the risks to crops and terrestrial ecosystems from ozone depletion is extremely limited.

Data for crop species, although incomplete and often not from field studies, suggest that large variations exist within species for response to UV. For example, in 3/4 of soybean cultivars tested, levels of UV simulating 16-25 percent ozone depletion reduced yields by up to 25 percent with quality reductions.

Little or no data exists for trees, woody shrubs, vines, or lower vascular plants. Increased UV could alter competition in natural ecosystems unpredictably.

Aquatic Life Effects. Experiments show that UV causes damage to fish larvae and juveniles, shrimp and crab larvae, and to plants essential to the aquatic food web. Enhanced UV would probably change the composition of marine plant communities and could cause unpredictable changes to aquatic ecosystems.

Current data is very incomplete and limited. Understanding of aquatic organism lifecycles and of aquatic ecosystems is very limited. Great uncertainty exists about effects because UV attenuation in the water column is variable and organism behavior can affect dosage.

Climate Changing Effects. CFC's, like CO2, are greenhouse gases, but more powerful by a factor of 10,000. Increasing concentrations contribute to global warming.

CFC's IN U. S. INDUSTRY

Use of CFC's in the U. S. is spread among seven use categories and a large number of applications.

Table 2

Use Category	1985 Use (Metric Tons)	Percentage of Ozone Depleting Potential
Solvents	41,369	14
Refrigeration	78,987	28
Foam Blowing	70,430	28
Fire Extinguishing	6,250	20
Sterilization	12,133	4
Aerosol Propellants	8,000	3
Other Miscellaneous	7,083	3

COSTS OF EMISSION REDUCTION

EPA has done a preliminary analysis of possible actions to reduce CFC compound use in the short (shown below), medium, and long term:

Table 3

Cost/Kilogram Reduced	Percent Reduction in Use (Weighted by Ozone Depleting Potential)
Short-term:	
<$0.15	30
$0.15 to <$2.30	5
$2.30 and more	16
Short-term total	61

CHEMICAL SUBSTITUTES FOR CURRENTLY USED CFC's

The industry is looking at several possible compounds which could be sustituted for current CFC's. The minimum time frame to introduce such susbstitute products into commercial use would be 5-10 years. For the following reasons, it is likely to be closer to 10:

- -- Publicly known production processes are low in yield with large waste streams that are partly toxic and partly recyclable. Long-term (3-4 years) toxicology tests will probably not be done until the process that will be used is defined and optimized.
- -- Potential producers may not commit to a process until they are reasonably sure that better ones don't exist.
- -- Commercial users may insist upon completion of toxicology testing before adopting new compounds.
- -- Users would also need a period for product compatibility/performance testing and for any product and process redesign.
- -- Producers would need time to design and build full scale plants.

Dupont has published estimates that substitutes are likely to have a cost that is 2-5 times that of current CFC's. However, for most uses, the cost of CFC's is a very small part of the total cost of the final product. Dupont estimates that 5-6 years would be needed to bring substitute compounds to the commercial market place, not including time for customers to shift to the new products.

One industry estimate of future U. S. CFC consumption estimates that a freeze would cause a real price increase of 2-3 times within the first 3 years and 4 times beyond 7 years. EPA and others argue that a freeze would not bring in substitute compounds in the short-term, because alternatives would prevent a sufficient price increase unless a 50 percent or greater reduction in use were imposed.

CFR CONTROL MUST BE GLOBAL

U. S. use of CFC's is 27 percent or world use and is not large enough that U. S. action alone can significantly affect long term emissions. Under the Clean Air Act, EPA must consider unilateral action even though it would not be as effective as global action.

CONTROL IN U.S. IS MORE DIFFICULT - AEROSOLS ALREADY BANNED

Patterns of use in the U.S. and in other non-communist reporting countries are significantly different. Other country use is 2 times U.S., Canada, and Sweden banned non-essential aerosol use in 1975, using available substitutes.

Some observers have argued that the U. S. position should be for equal percentage reductions in use after the elimination of non-essential aerosol use. Others argue that approach is very unlikely to be acceptable to countries with unrestricted aerosol use.

COSTS AND BENEFITS

CEA believes that given the projections of ozone depletion and estimates of the health consequences assuming no behavorial changes, it is possible to asess the economic benefits of the CFC control protocol presently under discussion. EPA's risk assessment indicates that the freeze + 20 percent cutback will avoid approximately 992,900 deaths in the U.S. from skin cancer among people alive today and those born through 2075. An additional 30 percent cutback will save an additional 78,700 lives. The economic benefit of saving these lives, under standard assumptions for valuation of statistical lives saved and discounting of future values, is very large, on the order of hundreds of billions.

These benefits, which do not include non-health benefits or benefits from avoidance of non-fatal skin cancers and cataracts, are much larger than the costs of control estimated by industry or EPA. Industry has estimated that the cost of a freeze to the U.S. would be about $1 billion cumulatively between now and the year 2000. EPA has estimated that the cost of a 30 percent reduction in the controlled substances would be about $3-$4 billion cumulatively between now and the year 2000.

File in my Stratospheric ozone file -

THE WHITE HOUSE

WASHINGTON

May 18, 1987

MEMORANDUM FOR EDWIN MEESE III

FROM: RALPH C. BLEDSOE

SUBJECT: Ninety-First Meeting of Domestic Policy Council

The Domestic Policy Council will hold its ninety-first meeting on Wednesday, May 20, 1987 at 2:00 p.m. in the Roosevelt Room. The subject for discussion is Stratospheric Ozone.

Stratospheric Ozone

- o There are two purposes for this meeting: to bring the Council up to date on the final stages of international negotiations on actions to reduce the depletion of stratospheric ozone, and to seek the Council's "guidance" on several negotiating problems.

- o OMB, Justice, Interior, and Commerce have asked that the Council take up this issue, since they had not been heavily involved in the earlier formulation of U.S. policies at the heart of these negotiations.

- o State and EPA, which have been predominant in framing the U.S. positions to now, have been generally cooperative in assisting the other agencies in learning about the problems and options available to us.

- o There will be three parts to the presentation to the Council:

  - Ambassador Richard Benedick, head of the U.S. negotiating team, will take about 10-minutes to provide background on the international negotiations, and where we now stand.

  - Bob Watson, a NASA scientist, will take about 5-8 minutes to outline the stratospheric ozone problem, and the scientific knowledge we have about it. He will point out the weaknesses and disagreements in current scientific models being used.

  - Benedick will take another 5-10 minutes to outline the four major issues for which the negotiating team wishes guidance.

- o Following the presentation, you should guide the discussion of each of the four issues.

- In his background remarks, Benedick will comment on:

  - scientific concerns that began in the 1970s
  - the U.S. aerosol ban in 1978
  - the UN negotiations leading to the 1985 Vienna Convention
  - the U.S. position in the Circular 175
  - progress made in the negotiating sessions
  - relationships between international and domestic policies.

- There are three aspects to the U.S. position:

  1. A freeze on emissions.
  2. Planned reductions and timing.
  3. Continuing reassessment of science as a basis for action.

- The four issues you might wish to guide the discussion through include:

  - Chemical coverage. What chemicals should be covered by the agreements that are reached?

  - Stringency and Timing. What reductions should be agreed to beyond a freeze, and over what time periods?

  - Control Formula and Trade Provisions. How might parties and non-parties to the agreements link their trade policies to controls and results?

  - Participation. What participation by various nations should be sought in the protocol?

- Chemical coverage will not generate too much discussion, except that DOD will express concerns about including Halon chemicals in the reduction targets. The biggest concern will be over which countries will want to take credit for previous reductions, and the ease with which some countries can achieve reductions.

- Stringency and Timing will be the most controversial area. The "Chairman's Text" calls for a freeze at 1986 levels, effective two years after entry-into-force (EIF); a 20% reduction 4 years after EIF; an additional 30% after a scheduled reassessment (6 or 8 years); and additional steps to possible elimination based on periodic reassessments. EPA will support the 50% and perhaps push for more. Interior and Commerce and others will only accept the 50%, provided it is supported by the "science." You should try to focus the discussion of these points so that the negotiating team knows the general directions it should go from the "Chairman's Text" i.e. stronger or weaker, and sooner or later.

- o The Control Formula and Trade Provisions issue is not fully developed, since there are numerous treaties, international laws, and other trade aspects that could lead us well beyond the immediate problem. There should be some discussion of this issue, since it will give the Council members a feel for the "total package" concept that will be a part of the final negotiations.

- o The same applies to the Participation issue, in that how lesser developed countries (LDCs) should be handled has not been fully developed. Again, there should be discussion of this, since it also will be a part of the total package.

- o Lee Thomas will be prepared to describe how the international negotiations have permitted him to have a lawsuit deadline for promulgation of domestic standards put off to December. He will also point out how the final agreements reached in September will influence the domestic rules he will ultimately have to develop.

- o If we run out of time at this meeting, we have time scheduled for next Wednesday, May 27 to continue the discussion.

- o Since the Council will receive a July briefing prior to the final negotiations in September, there will be an opportunity for the Council to make its recommendations, if needed, to the President. The President could then make his decision just before the negotiating team departs for the final sessions in Montreal.

- o Bob Sweet will be filling in for me and is up on the issue.

cc: Nancy Risque
Steve Galebach

SUMMARY OF NEGOTIATION ISSUES

SUBJECT: Stratospheric Ozone Protocol Negotiations

The U.S. negotiating team is seeking DPC guidance on the following issues:

Chemical Coverage

- o Should the team press for a freeze with the broadest attainable chemical coverage?
- o Given their defense uses, should Halon chemicals be excluded from reduction targets?

Stringency and Timing

- o Should the freeze at 1986 levels proposed in the "Chairman's text" be accepted?
- o Should the freeze take effect two years after entry into force (EIF) of the protocol or earlier?
- o Should an automatic 20% reduction take place four years after EIF or should a positive vote be required after science, technology, environmental, and economic (STEE) elements are reviewed?
- o Should an additional 30% reduction be scheduled?
- o Should reductions beyond 20% be subject to positive confirmation following STEE reassessment, or should additional reductions automatically take effect unless reversed?
- o Should confirmation/reversal of additional reductions be based on a majority or a two-thirds vote?
- o Should the team press for further scheduled reductions beyond 50%?

Control Formula and Trade Provisions

- o Should the team pursue a formula regulating trade among parties based on the following objectives: effective control of emissions with accountability; fewest restrictions on the flow of trade and capital among parties; and most favorable treatment for U.S. industry?

- Should the team pursue regulation of trade with non-parties consistent with GATT to encourage adherence to the protocol and to avoid benefits to non-parties at the expense of parties?

Participation

- Should concessions being considered in the "Chairman's text" for less developed countries (LDCs) be accepted, or should LDCs be exempted from controls only for a limited period followed by adherence to the protocol?

- Should participating parties have an equal vote or should the U.S. team press for weighted voting based on historic use and production levels?

Next Step

Once the DPC has addressed the issues listed above, the Working Group could be tasked with developing a U.S. alternative to the "Chairman's text" for review by the DPC. If approved, this alternative text could serve as guidance to the U.S. negotiating team for the next session.