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Global Change: Strategy Task Force Meeting - 10/3/90

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THE WHITE HOUSE

WASHINGTON

October 1, 1990

MEMORANDUM FOR MEMBERS OF THE GLOBAL CHANGE STRATEGY TASK FORCE

FROM: D. ALLAN BROMLEY

SUBJECT: GLOBAL CHANGE STRATEGY TASK FORCE MEETING

The Global Change Strategy Task Force will meet October 3, 1990, at 10:00am in room 22 of the Old Executive Office Building.

Department of State will present a debriefing on the preparatory meetings for the Framework Convention and the Second World Climate Conference. In addition, we will receive an update on the status of activities of the Comprehensive/Incentives Approach Task Force.

Thank you for your cooperation last Friday in achieving a consensus on the host city option (Washington, D.C.) for the February climate change negotiations.

THE WHITE HOUSE

WASHINGTON

AGENDA

GLOBAL CHANGE STRATEGY TASK FORCE MEETING

October 3, 1990

1. Debriefing on Framework Convention
2. Debriefing on Second World Climate Conference
3. Report from Task Force on comprehensive/Incentives Approach
4. Other business

Ken:

September 28, 1990

Status of Envirothings:

1. STRATEGY GROUP MEETING

- a. Kara has made all calls for meeting availability
Wednesday, October 3 (9 a.m. or 10 a.m.)

Room = 22 OEOB

✓**

Action: decide which hour for meeting and tell
Kara to make calls back ASAP Monday a.m.
to confirm that time/date/room #

- b. Proposed memo and agenda are attached for review and
changes

✓**

Action: MONDAY - When final, memo and agenda must be
prepared and sent out - fax

- c. I talked with Chris Dawson and she said:

*finalized and with
DOT report.*

- . Not necessary to bring the matter of who pays for
RSWG final report to this group - can be handled by
interagency group as is normally done
- . She will not be here for the meeting so would prefer
to address the issues paper (Outline of Preparations for
Negotiations on a Framework Convention on Climate Change)
the following week.

✓**

Action: she will want to come over to discuss this and the
paper on Monday (wht the author, Sue Biniaz) with
Ken Yale and Barry McBee

- . She felt it would be most appropriate to announce that
Knauss is head of SWCC delegation quietly at the
ongoing meetings tomorrow. She needs clearance and
can call later tonight.

✓**

Action: Final agenda needs to be prepared for distribution

**

Action: Kara must clear in all non-passholders

* * *

Action: Talking points on annotated agenda should be
prepared for DAB

✓**

Action: Contact Dick Stewart and ask him to make a
presentation at the meeting

✓**

Action: When Reinstein back in town (Monday), call him and ask him to present a briefing on the two prepcoms

2. H.R. 2984

- a. FCCSET group has copy of Ken's list of things we need prior to talks with Hill and will try to get materials from CEES legislative affairs person (Eileen Shea) or Paul Dresler (or his suggested person)
- b. Paul Dresler will provide Ken with update if you call him back (648-4450)
- c. Issue is on hold until more information is available

3. Kuassa statement for Sumner - attached

✓ * Action: please call E. Dawson tonight or tomorrow if possible. Otherwise, it can wait

(703) 820-7335

Vaughn

10-3 GCUO mtg.

Graz, Ireland, Pablos, Echazabal, Bollen, Stewart, Porter
Dunphy, Johnston, Porter, Krauss, Ogers, Kerrigan
Meloy, Ireland person, Hartness, Saitta, Gorman

Bollen

All objectives achieved in framework convention
Hemstern - Recommendations.

page four - agenda, everything agreed in this process
developing countries agreed for UN & A overnight. - will be
backed out in Nov. mtg. UN & A fight.

para 6 pg 7 protocols - no commitment to nego -
can be done by consensus. - contribution

same process, no commitment to agree

rules of procedure developed on side UN & A fight
schedule - 2 wk nego sessions max

3 - 4 no intervals

Nairobi - one mtg during 9,

pg 12, para 12 Green secretariat, off by UNEP
WMO, working with IPCC

legal narrow paper forms

no draft convention distributed before Feb.

parties to decide process and what will be negotiated.
countries calling to models

Jan 18 July - need to be determined

Committee to OSTR in State

Comprehensive approach -
~~series of~~ to

overview of debt

priorities for next 3 mos

Medull would be created.

EC meeting - early Jan to look at what has changed
political statements (#8)

OECD - analysis

DOE - analysis of economics.

know info. costs + constraints by other countries to
see (#6) who else would benefit,

- our relative position

- know where our vulnerabilities are relative to other
countries.

collecting data on where other countries are - potential allies

trying for major policy issues - what to propose
and agreed to.

GLOBAL CHANGE STRATEGY TASK FORCE

AGENDA

September 18, 1990

I. Introduction

- . Thanks for coming to the meeting - as noted, due to the busy schedule of international meetings this fall, we will be holding these once a week from now on. Last week, to make best use of everyone's time, we decided to have a number of information documents prepared for your review at this meeting. However, from now on we will plan to meet every week.

. Try to schedule the same time and day each week?

. As we have discussed at past meetings, we have a number of issues to address regarding, first, the Framework Convention Negotiations, and, secondly, the Second World Climate Conference Ministerial Declaration.

. Hopefully, you should have received a package of material yesterday with some background on these issues.

. Incidentally, I would like to thank Chris Dawson and the others at Department of State who have taken a great deal of time from busy schedules to prepare background materials for us. I realize that, like most of our groups, there is a small number of people covering a large number of issues and I want to express my appreciation for their hard work.

II. The FIRST ISSUE we should address is one which we have discussed somewhat in previous meetings - that of the TIMING, LENGTH, AND LOCATION OF THE FIRST NEGOTIATING SESSION ON THE FRAMEWORK CONVENTION.

. It is important to get a resolution of these issues at this meeting, if possible, so that we may get our clearance to our representatives who are presently on their way to the organizational session for that first negotiating session.

. That organizational session begins next week, Sept. 24

. As noted in the Options paper, we must resolve these issues so:

a. The President and the US are taken seriously in our offer to host this first session,

b. The US can be organized in our preparations for the negotiations by insuring that we have enough lead time to get ready.

. Go through the options paper (start on p. 2)

III. THE SECOND SET OF ISSUES that we should address are the major policy issues involved in the SECOND WORLD CLIMATE CONFERENCE MINISTERIAL DECLARATION

. Background:

. Last week, the OES PCC Working Group on Environment met to go through all of the US comments on the proposed language of the draft Ministerial Declaration.

. The US comments and changes are indicated on the Declaration in Appendix B, which presents the Declaration on a paragraph by paragraph basis.

. Chris Dawson has prepared an summary of the major policy issues which are represented in the document, This is in your package as Attachment A.

. Call on Chris to discuss the issues.

IV. OTHER BUSINESS

1. LEVEL OF REPRESENTATION

. As soon as possible, we next need to address the issue of the level of US representation at the Ministerial portion of the Second World Climate Conference.

. The possibilities range from that of a special negotiator to technical/legal experts.

. Go through options

2. NAS EVANS STUDY

. Recently, had a briefing from Sen. Dan Evans and Bob

Global Change: Status and Followup

I) Concerns

1. Process (management of the issue) -- Responsibility for monitoring and controlling policy development, coordination, and implementation among the agencies need better definition.
 - Current operations: a number of groups are involved in the policy process: 1. OES PCC interagency operations group; 2. GCWG, nominally the action officer on the issue; 3. A "strategy group" of this has become the "de facto" policy review body. 4. A rump group, headed by Sununu, has made certain key decisions.
 - EPRG is proposed as an overall coordinatin group within the White House for environmental issues.
 - DAB has been frustrated with the global change policy process, does not want to give up action on the global change issues, but he needs direction for his group.
2. Role of OSTP -- the role of OSTP in the process has to be defined, both as to process and substance.
 - Allan has the authority to lead the US effort in global change. Whether he decides to exert this depends upon the role of OSTP in this issue. (See attached options)
 - The FCCSET has a large science and technology substantive and coordinative role.

II) Current activities

- 1) Strategy meeting with DAB
- 2) Meeting with Andy Card, DPC and OCA
- 3) Environmental breakfast to further discuss the issue.

III) Proposed Action

- 1) Write up OSTP understanding of the environment policy mechanism.
- 2) Meet with Ede, Steve and Richard to determine the details.
- 3) Meeting between Card and Bromley to set up the coordinating mechanism.
- 4) Define relationship between FCCSET, GCWG, EPRG and DPC on policy issues to gain commitment to GCWG review of issues pertaining to global change and FCCSET coordination of science and technology issues.

DRAFT

Action officer: Lead role in the White House for formulation and coordination of the various agencies with responsibilities in global change. The GCWG would have a lead role, including substantive and political issues.

Pro

- o Visibility and stature. This is an important issue for the White House and the President.
- o Science is a major component of this issue and OSTP should assert its leading role.
- o OSTP has a track record in this issue and it would be natural for it to continue and build upon previous efforts.

Con

- o This is a large issue and will require a considerable amount of time and energy.
- o There are certain political liabilities associated with the issue and it has a checkered past. To do it properly would require much time and preparation to avoid the possibility of political backlash within the White House.
- o Proper staffing of the issue would require more people.

Teamwork: The GCWG would be a subgroup of a larger environmental group that would coordinate overall environmental issues for the Administration. It could play the lead role within that larger group, including substantive and political issues.

Pro

- o OSTP could continue to maintain the lead on the issues, depending on the dynamics of the group and the actual activity that the global group demonstrated.
- o The subgroup could focus on the science aspects of the issues, moving the political and policy issues to the larger group.
- o The burden of the global change issues could be distributed over a larger number of persons and agencies.

Con

- o There would be an additional layer of persons with whom to deal on the issues and OSTP would not be the lead players.
- o There may be conflicting expectations as to who is in charge of a particular issue.

Determined NOT to be
National Security Classified Marking
By RLB (NLGB) on 4/27/10

~~In Confidence~~

- o The role of OSTP might be diluted over time.

Supporting role: The GCWG would have an exclusively scientific role as a subgroup of a larger environmental group. It would not directly formulate policy or have the action for political decisions. Instead, it would perform a consulting role.

Pro

- o This is a logical function for OSTP, in its advisory capacity in the White House, and more time could be devoted to advocacy of the science behind global change instead of weighing the relative political or policy aspects of each issue.
- o OSTP would be out of the direct political firing line and could do what it does best -- give balanced scientific advice.
- o The time potentially taken by the political and policy issues in global change could be spent on other issues.

Con

- o OSTP would no longer have the lead role in the White House for global change policy formulation.
- o There may be a perception of a loss of stature.
- o A change in the current structure and responsibilities may add to the confusion over the lines of authority.

THE WHITE HOUSE
WASHINGTON

October 5, 1990

MEMORANDUM FOR GOVERNOR SUNUNU

FROM: D. ALLAN BROMLEY *Duan*
EDE HOLIDAY *EH*

SUBJECT: Global Change Strategy Task Force Meeting

The Global Change Strategy Task Force met on Wednesday, October 3. The State Department provided a debriefing on last week's preparatory meetings in Geneva on the framework convention negotiations and the Second World Climate Conference. In addition, the Department of Justice outlined the draft report of the Comprehensive/Incentives Task Force.

Framework Convention Negotiations: The United Nations Environment Programme and the World Meteorological Organization held a September 24-26 preparatory meeting to consider organizational issues for the first negotiating session and the schedule for future negotiating sessions.

The meeting produced several consensus recommendations:

- o Negotiations will begin in Washington on February 4 and continue for nine working days. The lawyers will produce a first draft of a convention during the meeting, but actual negotiations will be deferred. Nine days are considered necessary for this process, which the U.S. should be able to influence.
- o No draft convention will be distributed prior to February. It is clear that governments, and not Mostafa Tolba, will control the negotiating process.
- o Decisions on the convention will be made by consensus, effectively giving all parties a veto.
- o There will be a single negotiating forum, avoiding the prospect of the convention being renegotiated by the U.N. General Assembly. (LDCs will move this Fall to have the convention actually negotiated by the General Assembly; as this would likely doom chances of having a convention ready for signature at the June 1992 U.N. environment conference in Brazil, little support is anticipated.)

- o No agreement was reached on the timing of the negotiation of protocols, although it appears the prevailing sentiment is to work toward a simple, pure framework convention for 1992.
- o The IPCC First Assessment Report and supporting documents, including its legal measures paper, will serve as the primary documents for the negotiations. Political declarations such as those signed at Noordwijk and Bergen, will merely provide non-binding background information. The IPCC will provide "objective scientific and technical advice" to the negotiating process, with its exact role to be decided in February.
- o After the first session, most meetings will be held in Geneva, with at least one meeting in Nairobi. Meetings should be no longer than two weeks and will be held at three month intervals (May, August, and November 1991, with additional meetings in 1992.)
- o Non-governmental organizations (NGOs) with a "substantive interest" will be allowed to attend the negotiations as observers, but will be excluded from certain sessions.

A full list of recommendations from the meeting can be found at Tab A. A proposed agenda for the February Washington meeting can be found a Tab B.

Second World Climate Conference: State and Commerce led the U.S. delegation to the September 27-29 preparatory meeting. The draft ministerial declaration was considered and almost all of the language bracketed, which will make it difficult to produce a final declaration. State will propose an alternative draft declaration that is much shorter and more "ministerial" in tone and defers the substantive issues to the negotiations. Norway proposed a similar, though more political, draft in Geneva that was rejected, but State believes that its version may receive a warmer reception. The draft, a copy of which can be found at Tab C, is undergoing interagency review.

Thatcher, Mitterand and Kohl have tentatively accepted invitations to address the ministerial portion of the conference. Mulroney is considering going, but may defer to the U.S. lead. State sent a cable last week indicating that Dr. John Knauss will represent the U.S. at the ministerial.

Comprehensive/Incentives Task Force Report: Dick Stewart from Justice briefed on the draft "Interim Report: Research and Analysis to Support the Comprehensive and Incentives Approaches" (found at Tab D). The report discusses the correlation of the economic incentives approach and the comprehensive global change index based approach. The scope of the report is confined to issues of "how to" rather than "how much." Stewart also obtained approval for a set of priorities to accomplish the support work necessary to implement this approach (found at Tab E).

IV. RECOMMENDATIONS

The ad-hoc working group of government representatives to prepare for negotiations on a framework convention on climate change adopted by consensus the recommendations listed below in Section A, and identified the option below in Section B, regarding the organization of the negotiating process for a framework convention on climate change. Both sections are submitted for consideration initially by the forty-fifth session of the United Nations General Assembly in pursuance of its resolution 44/207 to recommend ways, means and modalities for further pursuing negotiations, taking into account the work of the Preparatory Committee of the UN Conference on Environment and Development, and then by the negotiating body at its first substantive session scheduled for February 1991 in Washington, D. C., USA.

A. Recommendations adopted by consensus

1. The negotiating process should be organized and conducted in such a manner as to ensure openness, transparency, universality and legitimacy. It should reflect the full participation and commitment of all States to the negotiations.
2. There should be a single negotiating process leading to a framework convention on climate change and any related legal instruments as might be agreed upon.
3. The negotiating body will discuss the policy issues. Governments will need to be represented at a level appropriate for this. The name of the body should also reflect this function in accordance with options suggested in this document.
4. The negotiating body should respond to UN General Assembly decisions. It should also regularly inform the Assembly, through appropriate channels, of progress in its deliberations.
5. The bureau of the negotiating body should reflect a proper geographical representation, balance of interests and specific concerns as mentioned in the Report, and be of strength sufficient to ensure equity and still limited to ensure effectiveness.

6. It is highly desirable that an effective framework convention on climate change, containing appropriate commitments, be ready for signing by governments and by regional economic integration organizations in conjunction with the United Nations Conference on Environment and Development (UNCED) in Brazil, in June 1992. Any related legal instruments might be developed on the basis of consensus decision by the negotiating body.

7. Participation of the maximum number of States and regional economic integration organizations in the negotiating process is considered essential for its success. Countries which have not done so, are urged to set up a national co-ordinating group to handle national information requirements relevant to the negotiations, and to serve as a link to the Secretariat of the negotiations. The special problems associated with ensuring the participation of developing countries, and the recommendations contained in the report of the IPCC to overcome these problems, should receive particular attention. To ensure adequate participation of the developing countries, small island states and least developed countries, a special Trust Fund should be created, on a similar basis to that for the UNCED and the IPCC, to assist in their adequate participation.

8. Rules of procedure of the negotiating body need to be elaborated for approval by the first negotiating session. They should be based on existing relevant rules of procedure, be acceptable by all States, Members of the UN, the Specialized Agencies, IAEA, and regional economic integration organizations, be compatible with the status of the negotiating body, and be such as to ensure active participation by all governments through fully accredited representatives, and be consistent with Recommendation 1 above.

9. Most negotiating sessions should have a maximum duration of two weeks, within available resources.

10. A tentative calendar, to be reviewed at the end of each negotiating session, should be as follows:

February 1991 - Washington D. C., USA
May - June 1991
August - September 1991
November - December 1991

and whichever meetings are needed in 1992, leading into the UN Conference on Environment and Development, Brazil, June 1992.

11. Non-governmental organizations with a substantive interest in the field should be permitted to attend negotiating sessions as observers. The practices of the UN and of the Preparatory Committee for UNCED will provide useful guidance before rules of procedure are finalized.

12. The negotiating body must have a strong, efficient secretariat at its disposal. This would be best assured if the secretariat were:

(1) located in Geneva and working closely with the IPCC Secretariat, although independent of it,

and

(2) the joint administrative responsibility of WMO and UNEP under the guidance of the negotiating body; this arrangement should be reviewed at the time of the first negotiating meeting in Washington in February 1991.

It should be of an appropriate size and quality, (the professionals consisting mainly of WMO and UNEP staff supplemented by professionals seconded by other UN agencies) and be adequately funded, to ensure that meetings are served to UN standards; in particular that documents were always to be available in the six official languages of the UN according to an agreed timetable and that interpretation in the six languages should be available at all negotiating sessions and at meetings of any sub-groups. It should work closely, and as necessary, with agencies of the UN and other international bodies concerned with climate related issues.

13. Taking into account paragraph 6 above, the Preparatory Committee of the UN Conference on Environment and Development should be kept informed of the progress of negotiations.

14. The negotiating body should have a link with the Intergovernmental Panel on Climate Change (IPCC) to ensure that the IPCC can respond to the needs and requests of the negotiators for objective scientific and technical advice.

15. Depending on the decision on ways, means and modalities to be taken in UN General Assembly, the negotiating body may establish sub-groups as needed. Some sub-groups might be required only at a later stage of the negotiations. If there are sub-groups to the negotiating body, not more than two meetings of the main body or sub-groups should be in session simultaneously.

16. The main documentation to serve as a basis for negotiations should be the IPCC First Assessment Report - including its legal and institutional mechanisms - and the background documentation. Other supplementary documents for consideration would include those resulting from previous international conferences on the subject and from the forthcoming Second World Climate Conference and such other documents as the negotiating body chooses.

17. A list of the elements identified by the IPCC for possible inclusion in the framework convention, or other related legal instruments, documents containing such elements, and comparative presentation of general principles of relevant treaties, should be before the negotiating body.

18. Individual governments are encouraged to present papers to the negotiating body, with help from the Secretariat within available resources.

19. The funding of the sessions of the negotiating body, and of the supporting secretariat, should be arranged through provisions in the regular budget of WMO and UNEP and/or with the use of a Trust Fund arrangement and/or other relevant funds.

20. After the first session of the negotiating body in Washington D.C. in February 1991, subsequent meetings should take place in Geneva with at least one of them in 1991 in Nairobi to be decided at the first session in Washington.

B. Option identified by the Ad-hoc Working Group

1. The negotiating body could be an "Intergovernmental Negotiating Committee for a framework convention on climate change", under the auspices of WMO and UNEP, or a "Specialized Conference for the Negotiation of a Framework Convention on Climate Change" with a Secretary-General appointed by the Secretary-General of the United Nations.

V. ADOPTION OF THE REPORT

29 The report of the meeting was adopted on 26 September 1990 at 11.25pm.

VI. CLOSURE OF THE SESSION

30. After usual exchange of courtesies the chairman declared the meeting closed at 11.30pm.

Annex 1

Proposed Agenda
First Negotiating Session
Framework Convention on Climate Change
Washington, D.C.
February 4 - 14, 1991

1. Welcoming Remarks
2. Opening of Meeting: Remarks by WMO Sec-Gen Obasi, UNEP Ex Director Tolba, IPCC Chair Bolin
3. Adoption of Rules of Procedure: Draft to be available
4. Adoption of Agenda
5. Election of Chair
6. Election of Bureau: Refer to Prepcom report and recommendations *... would should of done*
7. Organization of Work: To cover hours of sessions, meeting rooms, translation facilities (available only for negotiation group and subgroups, not regional and other interest groups)
8. Credentials Committee
9. Statements by Governments: To be brief (10 min max) and focused on issues raised in IPCC and other supporting documents
10. Preparation of Legal Negotiating Text *key item in meeting*
 - a. work program
 - b. establishment of subgroups } *subsequent meeting of 6-10-12-14 discuss*
 - c. legal drafting group } *... of groups*
 - d. review of draft legal text
11. Future Work
 - a. relationship with IPCC
 - b. time and place of next meeting
12. Adoption of Report *... agreed text, for annex, with brackets*
13. Close of Meeting

MINISTERIAL DECLARATION

PREAMBLE

We, Ministers from __ countries, assembled in Geneva, Switzerland, from 6 to 7 November 1990 at the Second World Climate Conference.

Conscious of our responsibility to present and future generations to preserve, protect and defend our fragile planet;

Alarmed by recent evidence that our actions may be altering the atmosphere which nurtures life and sets Earth apart from all other planets;

Uncertain still of what may follow, and at what cost, but convinced that delay will constrain our ability to act;

We embark now with common resolve on an effort which will require strength, resolution and steadfast purpose, an effort which will test every virtue of our peoples, but without which we can have no hope of success.

RISKS AND UNCERTAINTIES

1. Science tells us that gases produced by human activities -- the so-called greenhouse gases -- are accumulating in the atmosphere. Many of these gases are produced naturally and are essential to the habitability of our planet; still, the human contribution, particularly since the dawn of the industrial age, has perturbed their delicate balance in the atmosphere.

2. Science also warns us that the accumulation of greenhouse gases produced by human activities will lead inevitably to a global warming, perhaps at rates faster than any experienced since life as we know it began. Science predicts that the warming will not be even, that it is likely to occur more rapidly at higher latitudes, but that, once begun, we may neither be able to control or reverse it.

3. The state of our knowledge is imperfect -- many important uncertainties remain. Still we are aware that a significant warming may have harmful consequences for our planet and our peoples. Seas may rise, storms may increase and intensify and many species of life may not be able to adapt.

4. Facing such risks, but acknowledging great uncertainties, we must determine how extensively we must act, what the costs of action and inaction may be, and what measure of success will likely grace our efforts.

5. At this Second World Climate Conference we reaffirm our support for the World Climate Programme and for other cooperative scientific initiatives to resolve the questions before us.

PAST AND PROLOGUE

6. We recall that this endeavor is not without precedent. Our nations have already developed a common strategy to address a related global crisis -- stratospheric ozone depletion. From a modest beginning in 1985, we have quickly narrowed scientific uncertainties and summoned the resolve to take more stringent but necessary action. That action is also the most significant first step to limit the accumulation in the atmosphere of greenhouse gases from human activities.

7. We have also concluded an unprecedented international effort to analyze the science, impacts, and response options for further dealing with climate change. This effort, initiated under the joint auspices of the World Meteorological Organization and the United Nations Environment Programme, has produced the First Assessment Report of the Intergovernmental Panel on Climate Change. The Report has heightened our awareness and enlisted an increasing number of nations in the search for solutions.

8. We have thus set the stage for negotiations on a framework convention on climate change. We note with satisfaction that these negotiations will begin in three months time and that all parties have resolved to complete the convention, together with any related legal instruments as may then be agreed, by the time of the United Nations Conference on Environment and Development in June 1992.

9. We further note that the United Nations General Assembly will shortly consider ways, means and modalities for further pursuing these negotiations on the basis of recommendations produced one month ago by government representatives.

CALL FOR A GLOBAL STRATEGY

10. While uncertainty complicates our task, it will neither delay nor deter us. We must develop a global strategy to preserve our atmosphere. Our strategy must seek both to slow the predicted rise in temperature and to help us adapt to its effects.

11. It must be universal, involving all nations of the world, for only together can we hope to prevail.

12. It must be comprehensive, addressing all sources and sinks of the gases we produce, for the problem has many aspects, which must be considered together if our efforts are to succeed.

13. It must be equitable, taking into account our differing abilities to act and our differing contributions to past and anticipated future accumulations of greenhouse gases.

14. It must be pragmatic, recognizing our common desire to grow and provide for our peoples, without which prospect hope for human prosperity and dignity will wither.

15. It must also be farsighted, recognizing that future innovation will open possibilities as yet unknown, if we but direct our collective ingenuity to shape that future.

THE EFFORT REQUIRED

16. The challenge before us is great. How we meet it may influence life to come on our planet. We are aware that the effort required will be among the most complex and difficult ever undertaken. Our negotiators must find ways to accommodate a wide range of legitimate concerns while ensuring that we develop a specific program of action.

17. Foremost among these concerns is that shared by all countries -- that the actions we agree to take not foreclose economic growth. This concern is particularly acute among developing countries who have not yet attained the level of prosperity that prevails among countries of the industrialized world. Still, it is not unique to them, for disparities exist as well within the industrialized world.

18. We are aware that negotiators must also find ways to accommodate:

--the concerns of countries now determined to limit and reduce growing emissions of greenhouse gases as well as the concerns of countries whose growth depends on fossil fuel production;

--the concerns of countries, whose forests are integrally tied to their economic development yet which provide a critical element of the world's defense against global warming;

--the concerns of countries which bear a proportionately large degree of risk from the anticipated impacts of climate change, particularly countries in arid and semi-arid regions and small, low-lying coastal and island countries; and

--the concerns of all who understand that the burgeoning growth in our planet's population must be taken into account in our efforts to deal with global climate change.

19. We acknowledge that we must also deal anew with issues we have encountered in other fora, issues whose resolution often still eludes us. In particular, negotiators must develop:

--ways to assure that adequate financial resources are made available to countries that would otherwise be unable to join fully in this common effort;

--ways to assure that know-how and technological innovation continue to advance and are made affordable and widely available to solve this common problem;

--ways to assure that knowledge and information are fully and openly shared; and

--ways to assure that the educational and scientific infrastructure in all countries, particularly in the developing countries, is extended and enhanced to enable each of us fully to appreciate the scientific basis for climate change, the potential impacts of such change and evaluations of practical response strategies.

OUR COMMON FUTURE

20. Generations past once relied on faith in moving toward the future. Later generations placed their faith in reason. As we move now toward the second millenium we must seek to marry the two. We must urgently resolve the uncertainties that confront us. We must also accept that full knowledge may elude us for some time. We must begin now to take sustained, pragmatic action to secure our common future. We dedicate ourselves henceforth to develop a phased, flexible response that will enable us to take action now even as we seek to resolve remaining uncertainties and develop a comprehensive action plan for the future.

10/2/90
REVIEW DRAFT
Do not quote,
cite or
distribute

Task Force on Comprehensive and Incentives Approaches to Climate

**Interim Report:
Research and Analysis to Support the
Comprehensive and Incentives Approaches**

October 2, 1990

Introduction

This Administration has developed new approaches to the design of potential climate change policy, the "comprehensive" and "economic incentives"¹ approaches. The United States first clearly presented these approaches to the Intergovernmental Panel on Climate Change (IPCC) by letter in December 1989. They were presented more fully through an "Informal Seminar" for the IPCC Response Strategies Working Group (RSWG) officers in February 1990, accompanied by a booklet of Discussion Papers that have since been widely distributed. The new approaches have been reflected in U.S. positions in the IPCC and now in the IPCC report itself, and in several speeches, including the President's April 18 closing remarks to the White House Conference on Science and Economics Research relating to Global Change, and his July 11 news conference following the Houston Economic Summit meeting.

The discussion to date has largely been of a conceptual nature. Work must now be done on the practical workings of these approaches, and to the research and analysis that would be needed to assess their utility and to support their implementation. This Task Force was organized in May 1990 to specify, encourage, and coordinate this work. The Task Force is an interagency effort chaired by DOJ and involving representatives of numerous agencies, including CEA, CEES, CEQ, DOC/NOAA, DOE, DOI, DOJ, EPA, NASA, NSF, OPD, OSTP, State, USDA, USTR, Treasury, and WH Counsel. This "Interim Report" is provided to identify the research and analysis needed, the current Administration efforts

¹The "economic incentives" approach was originally focused on emissions trading, but has since been broadened to encompass other market-based economic instruments, including emissions taxes.

in that direction, and the further work required. Work is needed in several scientific, economic and institutional research areas that bear on or underlie these approaches, including efforts to quantify sources and sinks of multiple greenhouse gases and fill gaps in information on those sources and sinks, to quantify the relative environmental impacts of these gases, to compare the cost-effectiveness of these approaches and their alternatives, and to develop institutional arrangements that could translate these approaches from concept to practicality. In light of the plethora of upcoming discussions, workshops, conferences, international meetings, ministerial conferences and full negotiations -- including the first session of negotiations on a framework convention on climate change, to be hosted by the United States in February 1991 -- prompt attention to these topics is needed to prepare U.S. representatives for effective participation and to assess choices the U.S. may need to make in responding to others' proposals or putting forward its own.

Policy context

These approaches address the "how to" question -- how to design any policy that might be adopted to respond to potential climate change. Their principal aim is to improve the framework of policy analysis and the cost-effectiveness of any proposed policy choice. They do not address the larger cost-benefit question of "how much" policy action should be taken -- what level of social investment, if any, is warranted by risks of potential climate change. The work of this task force does not imply that a choice has been made to implement some policy action.

Furthermore, the "comprehensive" and "economic incentives" concepts are "approaches" or heuristics that offer insight into any discussion of response strategies for potential climate change. The utility of these approaches is not limited to the design of emissions limitation policies. Whether the strategy is pursuing scientific research, promoting new technology, enumerating the measures justified on other grounds that also have potential climate benefits,² or designing actual

²The major uncertainties surrounding potential climate change, potential response strategies, and the costs and benefits of both, have suggested a strategy of pursuing those policies which are justified on other (non-climate) grounds yet which also help to address potential climate change. More precisely, these are climate-relevant policies pursued in the face of uncertainties about predicted climate change which are so great that the present expected loss due to climate change (and thus the expected climate-related benefits of the policy) cannot

(continued...)

emissions limitations policies (whether domestic or international), these approaches suggest the desirable breadth, emphasis and direction of the strategy. The "comprehensive" and "economic incentives" approaches to potential climate change policy were originally developed in response to the piecemeal (CO₂-focused), command-and-control regulatory approach then dominating the discussion in the IPCC, but the approaches apply to the full array of policy types and options. And they apply to domestic as well as international discussions.

For example, a nation following the strategy of enumerating climate-relevant measures justified on other grounds could use the comprehensive approach to calculate the aggregate impact on net greenhouse gas emissions made by its various measures. A framework convention on climate change could take a comprehensive approach to the cooperative scientific and economic research to which the parties commit, including the development of international monitoring networks, as well as to any national emissions reporting, or to credit to be given under any future obligation for nations' current voluntary emissions-limiting activities. An economic incentives approach could be applied to adaptation measures desirable in long-range investments, such as coastal construction or water use planning.

Summary of the Approaches

The two approaches are compatible, but need not be employed together. Both approaches offer the possibility of designing environmental policies that achieve goals at lower cost and that heighten the possibility for diverse, innovative, flexible, and cost-effective responses.

Comprehensive approach. The "comprehensive" approach seeks to address all the important contributors to potential climate change, in contrast to a piecemeal focus on CO₂ from the energy sector. It therefore addresses all radiatively active trace gases (RATGs), primarily consisting of the greenhouse gases (GHGs), and their sources and sinks. GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), halocarbons such as chlorofluorocarbons (CFCs) and related substances (HCFCs, HFCs),

²(...continued)
confidently be said to exceed a de minimis level. Examples include emissions-limiting or adaptive steps taken for non-climate reasons, such as phasing out CFCs, afforestation, improving energy efficiency, and developing more drought-resistant strains of crops. Other examples could include reducing landfill emissions of NMHCs and CH₄, reducing auto emissions of CO and NO_x, and encouraging coastal development to account for current subsidence trends.

and tropospheric ozone (O₃), whose precursors include oxides of nitrogen (NO_x), non-methane hydrocarbons (NMHCs) (also referred to as "volatile organic compounds," VOCs), and carbon monoxide (CO).³ Different RATGs arise from different sources and are removed from the atmosphere by different sinks, yielding a "net emissions" budget. Different RATGs have different impacts on the environment; for example, each gas has a different ability to trap certain radiated energy ("radiative forcing") or to reflect it. In order to relate the comparative environmental impacts of the various RATGs, the comprehensive approach employs a parameter or "index" that calculates the relative contribution of increments of each gas to physical effects, such as radiative forcing, used as proxies for global externalities. The comprehensive approach thereby avoids ignoring the important gases that would be omitted from a CO₂-only approach, and avoids ignoring important sources and sinks that would be omitted from an energy-only approach.

As a means of developing an agenda for science and economics research, such as research on the likelihood or impacts of potential climate change, the comprehensive approach suggests the scope of the research agenda: the range of relevant inquiry, the gases and sectors relevant as inputs to economic models of RATG emissions, and the relative environmental externalities (both negative and positive) related to emissions of each gas.

As an approach to technology development, the comprehensive approach assists in identifying and comparing the relative importance of technologies and practices affecting potential climate outcomes.

As a means of enumerating climate-relevant measures justified on other grounds, the comprehensive approach provides a metric for identifying and assessing the policy actions that are relevant in the climate context. It could form the basis for calculating the aggregate impact of various such measures on a nation's net RATG emissions.

As an approach to emissions limitation rules or obligations, the comprehensive approach provides an environmentally coherent and least-cost design for limitations policy. A piecemeal approach, focused on one gas (e.g. CO₂) or one sector (e.g. energy), would omit salient RATGs, sources and

³Other RATGs affect the radiative balance of the atmosphere, but unlike GHGs, their main influence is not through absorption of energy reradiated from the Earth's surface. Aerosol particulates such as sulfur dioxide (SO₂), which generally reflect insolation and thus may exert a net cooling influence, are RATGs but not GHGs. A fully comprehensive approach would encompass all such RATGs.

THE WHITE HOUSE
WASHINGTON

October 5, 1990

MEMORANDUM FOR GOVERNOR SUNUNU

FROM: D. ALLAN BROMLEY *DB*
EDE HOLIDAY *EH*

SUBJECT: Global Change Strategy Task Force Meeting

The Global Change Strategy Task Force met on Wednesday, October 3. The State Department provided a debriefing on last week's preparatory meetings in Geneva on the framework convention negotiations and the Second World Climate Conference. In addition, the Department of Justice outlined the draft report of the Comprehensive/Incentives Task Force.

Framework Convention Negotiations: The United Nations Environment Programme and the World Meteorological Organization held a September 24-26 preparatory meeting to consider organizational issues for the first negotiating session and the schedule for future negotiating sessions.

The meeting produced several consensus recommendations:

- o Negotiations will begin in Washington on February 4 and continue for nine working days. The lawyers will produce a first draft of a convention during the meeting, but actual negotiations will be deferred. Nine days are considered necessary for this process, which the U.S. should be able to influence.
- o No draft convention will be distributed prior to February. It is clear that governments, and not Mostafa Tolba, will control the negotiating process.
- o Decisions on the convention will be made by consensus, effectively giving all parties a veto.
- o There will be a single negotiating forum, avoiding the prospect of the convention being renegotiated by the U.N. General Assembly. (LDCs will move this Fall to have the convention actually negotiated by the General Assembly; as this would likely doom chances of having a convention ready for signature at the June 1992 U.N. environment conference in Brazil, little support is anticipated.)

sinks. By aiming narrowly, it could very well induce unintended shifts of economic activities to unregulated modes that offset or even increase emissions of RATGs, much as focusing on air emissions alone can shift pollutants to toxic solid sludge discharges. For example, focusing on CO₂ alone could induce fuel-switching from high-CO₂ coal to lower-CO₂ natural gas, meanwhile leading to increased emissions of CH₄ from natural gas transmission leaks. The comprehensive approach cures these defects of a piecemeal approach. It also allows the flexibility to choose the least-cost mix of policy options yielding the desired overall RATG limitation. And, by addressing "net emissions," it encourages sink enhancement such as through afforestation or safeguards against pollution of oceanic phytoplankton. The comprehensive approach can be applied to a variety of emissions limitation measures,⁴ including emissions taxes and emissions trading, and including both domestic and international measures. If applied internationally, it has the additional benefit of affording each nation the flexibility and discretion to decide the mix of domestic policies regarding the array of gases, sources and sinks that that nation determines would best accomplish policy goals in light of its unique social, economic, cultural and institutional circumstances.

Economic incentives approach. The "economic incentives" approach similarly applies to a variety of policy options. In the emissions limitation area, it encompasses the panoply of market-based economic instruments, including emissions trading and emissions taxes, imposed to force internalization of the external environmental costs accompanying emissions. It includes the use of incentives to promote innovation in technologies and practices, and addresses adaptation as well as emissions limitation. These incentives could be applied domestically or internationally.

As one example, application of emissions trading to emissions limitation obligations would allow those emitting a substance to achieve compliance with limits on such emissions by voluntary agreements to reallocate emissions among individual emitters so long as the aggregate output did not exceed their overall limit. Thus, reductions would be obtained most at those places where reductions cost least. This could be accomplished by authorizing informal reallocations among emitters, or by formally issuing "allowances" and then authorizing a market in

⁴In light of the relative weighting of the various RATGs according to their environmental externalities and the flexibility afforded to choose a least-cost mix of measures, it is possible that the comprehensive approach could achieve an aggregate net RATG emissions limit by restricting emissions of some gases while allowing emissions of other gas(es) to rise.

the allowances. Experience with emissions trading in the U.S. indicates that it can achieve environmental quality goals at substantially lower cost, and therefore could be of use to nations domestically as they implement any limits on greenhouse gases. Several U.S. applications of emissions trading have been highly successful, such as the phasedown of lead in gasoline; some others have been instructive of the limits of emissions trading, especially when it is applied in the context of other regulatory restrictions on emitters. Allowing emissions trading among nations -- probably initially as informal reallocations accomplished through bilateral national accords -- could similarly be advantageous in the context of any international efforts to develop new technologies or limit emissions.

Emissions taxes would in theory also produce least-cost results. In general, while emissions trading provides more certainty about the quantity of emissions limitation achieved, emissions taxes provide more certainty about the cost imposed on emitters. Domestic use of emissions taxes could be apt where certainty as to cost is more important, or where revenue raising is an important goal. Imposition of international emissions taxes could raise additional institutional, political and sovereignty concerns -- such as whether nations would cede their sovereignty to an international tax authority, how the tax would be set, how it would be made equivalent across economies, and how the potentially enormous revenues raised would be allotted and expended -- that would probably not attend informal bilateral international emissions trading or domestic taxes.

As another example, market mechanisms could be used to encourage efficient adaptation practices. Long-range investments, such as coastal construction or water use planning, might, because of market failures or other institutional failures, be undertaken without giving appropriate weight to any climate change risks (e.g. rising sea levels or shifting precipitation). Such failures might be addressed by informational or incentive-based policies, such as by requiring coastal construction to purchase subsidence insurance, or by fostering a market in water resources that provides incentives for efficient use and long-range risk management.

Research and Analyses

The remainder of this Interim Report describes the research and analysis tasks needed to develop and support the comprehensive and incentives approaches. Our interagency task force has endeavored to identify all of the current agency activities related to each task, although we expect to learn of additional activities as this report is shortly completed.

A companion report being prepared jointly by the CEES' two working groups, Global Change and Mitigation & Adaptation Research Strategies, titled "Research in Support of a Comprehensive Approach to Trace Gas Emissions" (draft 10 September 1990), provides substantial additional detail on the ongoing scientific research relevant to these approaches and the research needed in the future.

Priorities and Timelines

For each task described below, our interagency task force has suggested a priority value and a timeline on which work could and should be completed to be most useful. The suggested relative priority is identified for each task as "high," or "medium," with the understanding that this list is itself a capsule summary of the highest priority items and does not mention numerous tasks judged to be somewhat relevant but not warranting inclusion here.

A time horizon of 3 months, 18 months, or 5 years is typically suggested for each task.⁵ The timeline developed is a combination of the practical pace of research, which suggested a breakdown of tasks into very short-term (3 months), near-term (18 months), or longer-term (5 years) horizons for each task; and the pace of international discussions, which suggested milestones at January 1991, the eve of the first negotiating session on a framework convention (3 to 4 months), June 1992, the target signing date for the convention (roughly 20 months), or 1995, the tentative time for the next full IPCC report (5 years).

The priorities and timelines suggested for each task are suggestions, and we anticipate further discussion and revision on these points.

⁵For certain tasks the timeline is different due to particular scheduling dates; for example, the Second World Climate Conference will be held at the end of this month.

Research and Analysis Underlying the Comprehensive Approach

I. Measuring and Monitoring Atmospheric Greenhouse Gas (GHG) concentrations

Any environmental impacts resulting from GHGs would be associated with changing actual concentrations in the atmosphere, not emissions per se. The comprehensive approach underscores the necessity of gathering data on atmospheric concentrations of all relevant GHGs. Over the last decade much work along these lines has already been undertaken or accelerated, including (i) direct measurement through ground station, aerial, and satellite observation of atmospheric (tropospheric and stratospheric) concentrations of several trace gases (chiefly CO₂, CH₄, N₂O, O₃, and CFCs), and (ii) sample records of past climate change found in ice cores, tree rings, and other sites. Measuring and monitoring past, current and future concentrations, temporal and spatial (e.g. vertical) distributions, chemistry, removal, and other dynamics of GHGs will remain an essential function under a comprehensive approach.

-- Current Administration efforts:

- Under the U.S. Global Change Research Program, several CEES agencies are conducting relevant research. For example, DOE, NASA, NOAA and NSF are conducting or will soon conduct direct measurement of atmospheric concentrations and distributions of CO₂, CH₄, N₂O, tropospheric O₃, CFCs, CO, NO_x and NMHCs. NASA, NSF and DOI are studying sample records of CO₂ and CH₄ in ice cores and tree rings. NASA and NOAA conduct direct observations of stratospheric O₃ and related substances. EPA monitors ambient concentrations of NO_x, O₃, NMHCs, SO₂, and CO. Internationally, the United States participates in the work of the World Meteorological Organization (WMO), the World Climate Program (WCP), the International Geosphere-Biosphere Program (IGBP), and many other monitoring efforts.

-- Future work:

- Ensure coverage of all relevant RATGs. Priority: high. Timeline: continuous.

- Advance the comprehensive approach in any framework convention on climate change. The science research section of the convention must address all the relevant RATGs. It should build networks of cooperative monitoring among nations. Priority: high. Timeline: 3 months to 18 months.

- Advance the comprehensive approach in the Second World Climate Conference. Priority: high. Timeline: 1 month and thereafter.
- Advance the comprehensive approach in the World Climate Program. Priority: high. Timeline: 1 month and thereafter.
- Ensure coverage of relevant temporal and spatial distributions.
- Advance understanding of chemical interactions among trace gases.
- Advance understanding of quantitative link between trace gases and radiative forcing.

II. Impacts of RATGs: Comparative Indices

Changing concentrations of RATGs in the atmosphere are of interest because those gases may yield environmental impacts on societies and ecosystems. Different substances in the atmosphere have different environmental impacts; it goes almost without saying that the environmental impacts of atmospheric oxygen, water vapor, and CO₂ are quite varied, and are believed to be fundamental to the present habitability of the planet. Incremental changes in concentrations of trace gases such as GHGs will similarly have various impacts depending on the particular gas at issue.

(A) Radiative forcing index

In the climate change context, the principal impact of RATGs under study has been radiative forcing. Radiative forcing is not the ultimate environmental impact of actual concern to societies and ecosystems; it is rather an intermediate physical effect that serves as a useful proxy or metric for assessing the impacts of different RATGs on the potential for warming-induced climate change, including atmospheric temperature change, changing precipitation, changing soil moisture, sea level rise, and temporal and regional variations, all of which in turn could affect biological and other systems. Molecules of different RATGs have different radiative forcing properties, and estimates of the relative radiative forcing of incremental amounts of GHGs can provide a common scale along which to compare the gases. A comparative parameter of relative radiative forcing, sometimes called a "global warming potential" (GWP) index or an index of "CO₂ equivalence," has been developed by several scientists. The index incorporates the instantaneous radiative forcing of each type of molecule, its dissipation function and hence its typical residence time in the atmosphere, and the discount rate applied

or the time horizon over which the forcing function is integrated.

-- Current Administration efforts:

- Considerable work has been done on the relative radiative forcing of many RATGs. Estimates of instantaneous radiative forcing, derived from laboratory tests of molecular properties, are well established, as are residence times for several RATGs.

Work in this area has been done by NASA, NOAA, NSF, EPA, and DOE, and has been reviewed and reported by IPCC WG I.

-- Overview of needed work:

Priority: In general, this task is extremely urgent, as it constitutes the technical focal point of the comprehensive approach.

Timeline: Current work on relative radiative forcing is very active; the science is maturing; and robust, reliable, consensus estimates will likely be ready in the near term (6 to 18 months), though with continued uncertainties on specific aspects.

-- Future work:

- Convene international workshop(s) to discuss current work and needed improvements, to build understanding among diverse and representative experts, and to encourage multidisciplinary efforts. EPA, NOAA and NASA are jointly planning to host such a conference in November 1990. Priority: high. Timeline: 3 months.

- Harmonize various quantitative approaches and extend international understanding of indices. Priority: high. Timeline: 3 to 18 months.

- Improve accuracy of dissipation functions and hence of estimated residence times of RATGs. Scientific uncertainties in the current estimates remain surrounding the residence time of CO₂, due to complications in the carbon cycle and uncertainties in CO₂ sink removal processes. Atmospheric chemical reactions involving other gases, such as CH₄ and precursors to tropospheric O₃, complicate estimates of their residence times. Recent work at NOAA is substantially improving estimates of the dissipation rate and residence time of CH₄. As work is ongoing, uncertainties in best estimates can be expressed and revised. Priority: high. Timeline: 3 months to 5 years, varying by gas.

- Incorporate indirect effects attributable to various gases' atmospheric reactions. Certain trace gases react to form other radiatively important trace gases,

or react with substances that would otherwise affect RATG abundances. Much of this work has already been conducted, hence: Priority: medium. Timeline: 18 months to 5 years, depending on gas.

- Take account of "saturation" effects. Radiative forcing by each RATG occurs within a different segment of the electromagnetic spectrum; as that segment or "band" becomes occluded, additional increments of the gas have diminishing marginal radiative forcing impacts. Radiative forcing estimates thus depend on, and need to be expressed in terms of, projected concentrations of relevant RATGs. Much of this information is already available and needs to be incorporated into expressed estimates. Priority: medium to high, depending on significance of the effect for each gas. Timeline: 18 months.

- Take account of the implications that vertical and other distribution of RATGs in the atmosphere may have for calculated index values. This factor is quite important for O3 and its determinants -- CH4, CO, NOx, NMHCs. Priority: high for relevant gases. Timeline: 18 months.

- Improve use of discount rates/time horizons. IPCC WGI expresses GWPs in three selected time horizons; analysis is needed of which of these three horizons, or which other horizon, is appropriate for policymaking. More broadly, better understanding is needed of the scientific and economic basis for choosing different discount rates. Priority: high. Timeline: 3 to 18 months.

- The indices calculated to date have often focused on GHGs and omitted other RATGs. Assess implications of including other relevant substances, such as anthropogenic aerosol particulates (e.g. SO2), in the index. Priority: medium. Timeline: 3 to 18 months.

- Develop institutional mechanisms for adopting a consensus index and adjusting it to new research results. Because uncertainties remain in certain aspects of the index, index values may change as new scientific information is discovered. If an internationally agreed index is used as a tool for design of national policy portfolios to limit net index-weighted RATG emissions, changes in the index values could mean changes in the costs to each nation of its policy package. Mechanisms should be developed for giving advance indication of index uncertainties and likely changes in the index, incorporating new scientific information, and smoothing transitions to new index values. Such mechanisms could include objective science panels and periodic reassessments. Priority: high. Timeline: 3 to 18 months.

(B) Global change index

As indicated above, radiative forcing is only an intermediate physical effect of trace gases, and is really a proxy used as a common metric to compare diverse RATGs.⁶ But RATGs have multiple attributes; they yield other, non-warming environmental impacts of global and local significance which may be more important (in magnitude, timing, or other features) than their contributions to radiative forcing. For example, CO, NOx, urban O3, and SO2 are reactive and/or toxic; CFCs and related substances deplete the stratospheric ozone layer; higher CO2 concentrations increase plant photosynthesis and increase plants' water use efficiency. Optimal policy choices would entail developing a comparative index that incorporates the full externalities (social and ecological costs) imposed by increments of each RATG. Without such a "complete" index, a simple radiative forcing index could provide signals or incentives that yield desirable changes in aggregate radiative forcing but undesirable changes in other impacts; in other words, significant externalities will remain uninternalized.⁷

At the same time, a fully "complete" index poses quite difficult analytic and technical problems. Data are not adequate on important aspects of the magnitude and variations of the diverse impacts; for example, data are lacking on the effects of ozone depletion on UV-B irradiance, and on the effects of changes in UV-B irradiance on biota. Comparing the dissimilar warming and non-warming impacts on a common scale, something like comparing apples and oranges, is a challenge requiring serious analytic efforts.

A somewhat more realistically achievable index would incorporate only the key "global change" attributes of each RATG, namely their radiative forcing and the other salient non-warming global impacts of GHGs, such as the direct effects of CO2 on vegetation and the ozone depletion impacts associated with CFCs and other halocarbons. Essentially local attributes of the

⁶Measurement of the ultimate impacts of warming itself on biological and other systems, though critical for assessing the costs and benefits of climate change, are not incorporated into the radiative forcing index because such impacts stem from warming generically, and do not vary depending on the type of gas enhancing the warming.

⁷It is worth noting that, in contrast to the warming-specific term GWP, the phrase "CO2 equivalence," though unfortunate for its focus of attention on CO2, does offer the opportunity to introduce non-warming effects into the generic concept of "equivalence."

gases, such as their toxicity, would be left to local policy strategies. This "global change" index would capture the main global externalities associated with the gases, providing significantly more optimal policy signals than an index limited to radiative forcing. It would nonetheless require effort and time to construct.

The desirability of a "global change" index faces a dilemma: pushing too hard for a more complete index could undercut the legitimacy of the radiative forcing index, leading to the latter's disparagement or rejection by other nations, or perhaps to the view that one must wait years for a more complete index. This in turn could encourage the reinvigoration of gas-by-gas policy proposals. A two-pronged effort is therefore needed, to build, improve and promote the radiative forcing index, and at the same time to work on a global change index without undercutting the radiative forcing index.

-- Current Administration efforts:

- Conceptual thinking about design of a global change index. (DOJ, USDA)
- Efforts to quantify direct environmental impacts of CO2 enrichment, chiefly its impacts on agricultural and forestry output, and on water resources. (DOE, USDA, DOI, EPA, NSF). These efforts are high priority in any event.
- Efforts to quantify environmental impacts of stratospheric ozone depletion and resultant UV-B irradiance due to halocarbon emissions, such as impacts on agriculture, phytoplankton, and cancers. (USDA, EPA). These efforts are high priority in any event.

-- Future work:

- Address technical and analytic issues in a global change index. Whereas the common proxy or metric used in current indices is radiative forcing, a global change index would require a common metric among the various warming and non-warming impacts. It would also require application of discount rates because different impacts may occur at different times; for example, CO2 enrichment will likely occur much sooner than any observed warming due to CO2. (DOJ, USDA, DOI). Priority: medium. Timeline: 18 months.
- Undertake preliminary design and rough quantitative estimate of a global change index, in order to assess the difference between the relative RATG values obtained in a global change index versus a radiative forcing index. This effort would also indicate whether a global change index is sufficiently different to be worth developing. Priority: medium. Timeline: 3 to 18 months.

- Improve understanding of direct environmental impacts of CO2 enrichment, including the impact of CO2 in concert with changes in other environmental variables such as temperature, moisture, and other pollutants. (DOE, USDA, DOI, EPA, NSF). Priority: high. Timeline:
- Improve understanding of impacts of ozone depletion, including measuring UV-B irradiance and assessing impacts of UV-B radiation on biological systems. (USDA, EPA). Priority: high. Timeline:

III. Measuring and Monitoring net GHG emissions

Assessment of current and future net emissions is critical to the task of predicting the contribution of net emissions to atmospheric concentrations and hence to forecasting potential climate change, regardless of whether any emissions limitations are ever adopted.

The comprehensive approach emphasizes attention to all RATGs, sources and sinks. Baseline data on all of these is not always currently available. In addition, much of the data that are available derives from estimates using data on inputs (e.g. fuel quantities) and knowledge of or assumptions about input-output ratios associated with technologies or practices. Better measurement, forecasting and actual monitoring of net RATG emissions is suggested by, and needed to support, the comprehensive approach.

The ability to better monitor future emissions could also be useful in verifying the implementation of limitation actions and in assuring others' compliance with their claims and with international obligations. This is true of domestic limitations rules as well as international obligations; if a domestic GHG emissions limitation policy is to be effective and, in particular, is to employ performance standards rather than technology-based standards, it will require sound emissions monitoring techniques.

(A) Measuring net GHG emissions

-- Current Administration efforts:

- Numerous agencies collect and analyze data on various gases, sources, sinks, sectors, and industries, and thereby measure emissions from a variety of sources (e.g. energy utilities, mobile sources, land use, agriculture) and uptake by a variety of sinks (e.g. oceans, forests, soils, grasses).
- Efforts are underway to assemble "inventories" of net

emissions of GHGs for many nations,⁸ chiefly EPA's analysis of CO₂, CH₄, CFCs, HCFCs, N₂O, CO, NO_x, and NMHCs for the US and other nations.

- Data are generally adequate on US and other industrialized nations' emissions of GHGs from fossil fuel combustion (generally measured by data on fuel inputs and knowledge of typical combustion techniques), and on world emissions of halocarbons (generally measured by production, consumption and storage rates).

-- Future work:

- Ensure that measurement covers all relevant GHGs, sources and sinks. Priority: high. Timeline: continuous.

- Improve data on other nations. Data on developing nations are particularly scant. The framework convention could call for development of information on all nations, including through a network of cooperative international measuring. Priority: high. Timeline: 18 months to 5 years.

- Develop technologies for measuring net GHG emissions, including direct observation and remote sensing. Priority: medium. Timeline: 18 months to 5 years.

- Develop a data set of emissions/uptake factors for current and potential technologies and practices, covering all relevant gases, sources and sinks. Priority: high. Timeline: 18 months.

- Develop practical proxies or surrogates, such as fuel or fertilizer input data coupled with assumed output rates (e.g. combustion or cultivation techniques), or acreage or livestock data coupled with assumed output rates, to generate emissions factors to assist in measuring emissions. Ensure that measurement uncertainties and assumptions, and use of

⁸ Efforts outside the government include: OECD project, soliciting data from member states on all GHGs; WRI project (in conjunction with UNEP/UNDP) on all nations' net emissions of CO₂, CH₄, CFCs; Harvard Kennedy School survey of many nations' emissions of CO₂ and CFCs.

proxies/surrogates, do not distort policy responses.⁹
Priority: high. Timeline: 18 months.

- Improve understanding of the processes involved in natural emissions and sink uptake, and how these activities might be influenced by climate change.

Priority: high. Timeline: 3 months to 5 years.

- Ensure that data presentations are comprehensive, e.g. avoid CO2-only or fossil fuels-only charts in IPCC, NES, OTA, and other reports except as adjuncts to complete GHG presentation. Priority: high. Timeline: continuous.

- Ensure that data presentations include the scientific uncertainties involved. Priority: medium. Timeline: continuous.

(B) Forecasting future net emissions

-- Current Administration efforts:

- Use of economic models to generate scenarios of future emissions. EPA, DOE, and NSF are conducting such work, using a variety of economic models. U.S. agency work was reviewed and reported in the IPCC WGI/WGIII emissions scenarios.

-- Future work:

- Current economic models tend to focus on CO2, separate sectors, and industrialized nations. Need to make use of new and expanded models that overhaul and elaborate current economic models to cover multiple RATGs, multiple sectors, and other important improvements. Ensure that these models include GHG sinks and other aspects of the comprehensive approach. DOE has a three-year phased project underway to accomplish this; EPA is working on improving its models. Priority: high. Timeline: 18 months to 5 years.

⁹For example, measurement of CH4 emissions based on a proxy such as total acreage of rice cultivation might imply that the only option to reduce emissions is reduced rice cultivation, whereas changed practices using existing or new rice strains might accomplish the same at lower socioeconomic cost. In general, the use of proxies should not be allowed to conceal opportunities for changing the emissions factors or other assumptions from which the proxies derive.

(C) Monitoring net emissions in the future

This task is useful to test empirically the effects on RATG net emissions of observed changes in economic activity, economic structure, and technologies and practices. It is also useful to evaluate accomplishment of nations' espoused policies and of any limitation agreements reached in international accords.

-- Current Administration efforts:

- Efforts to improve monitoring of non-point emissions, including CH₄ emissions from rice cultivation (EPA) and ruminant animal husbandry (EPA); and GHG emissions from biomass burning (deforestation) (EPA, NASA, USDA).
- Efforts to improve monitoring of CH₄ emissions from energy systems such as natural gas transmission and fossil fuels extraction (DOE, EPA).

-- Future work:

- Use proxies/surrogates, developed for measurement of net emissions (section (A) above), to monitor emissions through monitoring of inputs, technologies and practices. Priority: high. Timeline: 18 months.
- Expand monitoring capacity and data to cover all relevant gases, sources, and sinks: data are especially needed on non-point sources of CH₄ and N₂O, e.g. agriculture, livestock; hydroxyl chemistry and atmospheric chemical reactions yielding tropospheric O₃; non-point sources and sinks of CO₂, including oceanic biota, terrestrial biota, long-term sequestration, plant lifecycles, grasses, soils, and trees, extent and effects of deforestation, and sink behavior. Priority: high. Timeline: 18 months to 5 years.
- Expand monitoring capacity and data to cover all nations. Current data generally cover industrialized nations. Develop an international network of cooperative net emissions monitoring. Priority: high. Timeline: 18 months to 5 years, depending on gas and sources/sinks.
- Harmonize techniques and data among nations and analysts. For example, resolve differences among nations monitoring deforestation (Brazil is urging that only its satellites produce reliable estimates of Brazilian land use). Priority: high. Timeline: 18 months to 5 years.
- Develop monitoring technologies and capabilities, as described under "(A) Measuring net GHG emissions" (above). Priority: medium. Timeline: 18 months to 5 years.
- Identify potential international and national methods for monitoring net GHG emissions; assess institutional,

political, social, and economic constraints on such monitoring, and means to overcome such constraints. Priority: high. Timeline: 3 to 18 months.

- Assess options for monitoring arrangements, including arrangements for monitoring and reporting and their relation to sovereignty concerns, e.g. voluntary or mandatory national reporting; "national technical means" of observation of other nations' activities; remote sensing; atmospheric observations; international oversight bodies (e.g. UNEP investigators); permission for on-site inspections; bilateral trade partner review under emissions trading; incentives and institutional designs to encourage development and application of accurate monitoring & reporting, for example by assuring credit for net GHG limitation actions (e.g. climate-relevant actions justified on other grounds) upon a showing by the emitter of successful monitoring practices (see section VI below); verification and enforcement procedures and their rules, reporting and enforcement procedures, burdens of proof, forum (international or bilateral, political or scientific adjudicators, etc.). Examine role of nongovernmental organizations and public. Priority: high. Timeline: 18 months.

IV. Evaluating current national policies and proposals

Whether or not international agreement is reached on response strategies to potential climate change, nations are already announcing their intention to restrict emissions of one or more RATGs or to expand RATG sinks. The U.S. policy of pursuing climate-relevant measures justified on other grounds has been articulated in qualitative form; at some point the U.S. -- or others -- may choose to present quantifications of the net RATG effects of these U.S. measures. The comprehensive approach provides the basis for computing the aggregate impact of such diverse measures. In addition, it may be valuable for the U.S. to assess the policy claims and policy proposals being made by other nations, using the comprehensive approach, and to examine the policy opportunities that would face other nations under a comprehensive approach.

(A) Extent and costs of net GHG limitations achieved by U.S. policy options within a comprehensive framework.

As described in the Introduction, it is useful to identify actions taken for other (non-climate) reasons but which influence net RATG emissions. One may calculate the percent limitations or reductions achieved by these policy actions using the comprehensive approach, and also calculate the marginal, average, and total cost per policy action.

This could be a first step toward assessing the marginal and total costs of RATG avoidance from different gas/source/sink policy options and hence toward assessing the relative cost-effectiveness of the comprehensive versus piecemeal approaches.

-- Current Administration efforts:

- analysis of US policies in EPA Cost Study/"Comprehensive Budget" analysis (covering U.S. energy efficiency and clean energy initiatives, CFC phaseout, afforestation, landfill rules, and other policies) through 2000. Priority: high. Timeline: 3 months.
- DOE/NES analysis of US energy policies through 2030, including NES options, afforestation, and CFCs. Priority: high. Timeline: 3 months.
- DOC study of future emissions under different tax options and under EC-wide strategy or global strategy. Priority: high. Timeline: 3 months.

-- Future work:

- Improve basis for projecting emissions limitations achieved by current policies
- Expand to cover influence of changes in agricultural subsidies, other relevant policy measures
- Look beyond 2000.

(B) Analysis of net GHG limitations achieved by other nations' policies

Analysis similar to that described for U.S. "no regrets" measures above should be undertaken for the policies announced and implemented by, proposed by, or available to, foreign nations. Certain nations have suggested unilateral limits on CO2 emissions (e.g. Sweden, possibly Japan), on nuclear power (Sweden, GDR), on SO2, NOx, and NMHCs (U.S.); and others have announced willingness to enact CO2 limits if others do too (e.g. U.K., Netherlands), and others have endorsed the Noordwijk Declaration's suggestion of CO2 emissions stabilization by industrialized countries by 2000.

-- Current work:

- Obtain information on each nation's policies.

-- Future work:

- Using a comprehensive approach, calculate the value of current policies in place in nations abroad, as

described above for U.S. actions.¹⁰ Assess how other nations would fare under a comprehensive approach.

Priority: high. Timeline: 3 months.

- Include consideration of foreign nations' agricultural subsidies and other relevant policies regarding non-point sources. Priority: high.

Timeline: 3 months.

- Expand to cover developing nations. Priority: high.

Timeline: 3 months.

- Using a comprehensive approach, calculate the influence each foreign proposal would have on net RATG emissions and GHG concentrations. Priority: high.

Timeline: 3 months.

- Include modeling of international energy markets and effect of price responses to unilateral demand reductions. Priority: high. Timeline: 3 to 18 months.

V. Evaluating the comparative cost-effectiveness of piecemeal, partial, and comprehensive approaches.

Advocacy of the comprehensive approach is based in part on the intuitively strong hypothesis that the marginal costs of control vary across gases, sources, sinks, and nations, so that for any assumed limitation obligation,¹¹ each nation's least-cost mix of limitation strategies would be different and all nations, regardless of their current RATG inventories, would be better off under a comprehensive approach than under an approach which placed separate limitation obligations on each gas or sector.¹²

¹⁰Special attention may be due the range of CFC-substitutes to be used by each nation. Japan, for example, is apparently presenting figures that show larger reductions in radiative forcing from phasing out unit amounts of CFCs than is the U.S., suggesting that Japan may be counting on selecting CFC-substitutes with lower GWPs than those to be used in the U.S. This also suggests that the Montreal Protocol, although potentially helpful as a no regrets measure, may not by itself be sufficient to address climate concerns associated with ozone-depleting substances.

¹¹As stated in the Introduction, given an assumed objective, the task is to assess the comparative costs of achieving it under different policy designs. This task does not assess the overall rationality or economic efficiency of the chosen objective.

¹² The aggregate shares calculated in the inventories (in Part III(B), above) do not indicate the costs of incremental limitations for each nation. Simply because a nation currently has a large share in methane, for example, does not mean that
(continued...)

This task is needed to test that hypothesis and, if confirmed, to demonstrate the value of the comprehensive approach.

- (A) Marginal costs: information and analyses needed to map full comparative cost-effectiveness functions and variations by gas, source, sink, sector, nation.

This task moves beyond analyses of specific existing policy programs and evaluates the full marginal cost functions facing policy makers and private actors.

-- Current Administration efforts:

- DOE/NES analysis for US energy sector policies and afforestation

-- Future work:

- Expand to cover all relevant gases, sources, sinks, sectors. Priority: high. Timeline: 3 months.
- Expand to cover other nations. Priority: high. Timeline: 3 months.
- Assess full social costs, using general equilibrium model rather than expenditures by the regulated industry.¹³ Make use of forthcoming models. Analyze costs over time, relation to innovation.¹⁴ Priority: high. Timeline: 18 months.
- Include (qualitative) evaluation of non-economic costs to response options, e.g. cultural or institutional barriers to certain policies. Priority: medium. Timeline: 18 months.
- Assess informational, administrative, and other transactions costs of piecemeal, partial and

¹²(...continued)
that nation would find methane reductions costlier than CO₂ reductions, at the margin. Economic analysis is needed to test the hypothesis of varying costs and to demonstrate the benefits to every nation of being afforded the cross-gas, cross-sector, and source-sink flexibility of the comprehensive approach.

¹³ The comparative impacts on macroeconomic and international variables (e.g. trade, competitiveness, economic growth) would require separate study.

¹⁴ Evaluation should also address the likely economic impacts in the US and worldwide of potential future changes in the understanding of the gas-comparison index, and means to cushion adverse impacts (e.g. periodic public science reviews).

comprehensive approaches. Priority: medium. Timeline: 18 months.

- Evaluate the benefits (effectiveness) of policies, in terms of RATGs avoided. Priority: high. Timeline: 3 to 18 months.

- (B) Use cost-effectiveness analyses to evaluate costs and benefits to the US and other nations of possible piecemeal, partial and comprehensive options that will be suggested for international policy design

This task moves beyond the analysis of current policy proposals suggested in section IV above to examine the marginal costs of policy designs, and to consider both proposed and hypothetical policy designs. It also focuses on international accords rather than national actions. This task is essential if U.S. policy makers and negotiators are to be able to assess policy proposals that inevitably be made as negotiations on a framework convention on climate change unfold.

Potential policy designs to be compared include: CO2 only, all RATs, or all RATGs except those covered under the Montreal Protocol; sources only, point sources only, all sources and sinks, or sources and terrestrial sinks only; all sectors, or certain sectors (e.g. energy, industry, transport, agriculture, forestry).

Priority: high. Timeline: 3 to 18 months.

- (C) Evaluate the environmental effectiveness of comprehensive and piecemeal approaches: propensity and impact of induced shifts in residuals

Thus far, for any given policy goal, a piecemeal (e.g. CO2-only) approach and a comprehensive approach have been assumed to yield identical results in terms of aggregated GWP (or full environmental impacts). In other words, whether a reduction in net index-weighted ("CO2-equivalent") emissions were achieved in CO2 or in a combination of gases, the overall calculated effect on the index value of concern would be the same.

But such analysis fails to account for actual economic and social responses to policy interventions. Advocacy of the comprehensive approach is based in part on the intuitively strong hypothesis that including all gases, sources and sinks ensures better effectiveness in any effort to limit contributions to potential radiative forcing (or full impacts), because piecemeal rules applying to one gas, source (or sector), or sink will engender shifts of

socioeconomic activity from regulated to unregulated modes, undercutting achievement of policy goals. Case studies will be especially helpful to illustrate these issues.

-- Current Administration efforts:

- Understanding of prior piecemeal approaches in environmental regulation and their resultant shifts of residuals, including single-medium approaches, e.g. to discharges into air, land, and water; and single-pollutant approaches, e.g. to SO₂.
- DOE/NES study will address CO₂ and CH₄ emissions from energy sector; it should consider potential GHG-related environmental effects of fuel switching, new energy sources, and sectoral shifts.

-- Future work:

- Develop "crisp retorts" to piecemeal approaches: Conduct case studies of cross-gas shifts: e.g. fossil fuel switching (coal to natural gas) induced by CO₂-only policies could have attendant impacts on CO₂-to-CH₄ emissions shifts due to CH₄ leakage from natural gas transport.¹⁵ Expand cross-gas shift studies, e.g. apply coal-to-gas CO₂-CH₄ shift analysis to actual global GHG output and in light of likely GHG emissions/leaks from future coal and gas facilities. Priority: high. Timeline: 3 months.
- Evaluate cross-source/sector shifts: e.g. under a transport-only policy (such as a high CAFE statute), possible shift from fossil fuel combustion on board vehicles to electric cars powered by central utility combustion, or to use of intensely cultivated biomass fuels; e.g. under an energy-only or fossil fuel-only policy, possible shift to biomass fuels whose cultivation emits other GHGs. Priority: high. Timeline: 3 months.
- Include consideration of international market responses to unilateral policy choices. Assess cross-boundary shifts, through price effects and industry flight, of unilateral or OECD-only policies. Priority: high. Timeline: 3 months.

(D) Evaluate the environmental benefits of a "net emissions" approach

¹⁵ See, e.g., Rodhe, Science 8 June 1990. Using a 100-year time horizon and a CO₂-equivalent GWP for CH₄ of 10, Rodhe estimates that if a CO₂-reduction policy were accomplished by fuel switching from coal to natural gas, a 3-6% CH₄ leakage rate from natural gas transport facilities would fully offset all the CO₂ reductions resulting from the fuel switch.

A net emissions approach, encompassing both sources and sinks, would encourage sink protection and expansion, whereas a source-only approach would not. Sink policies encouraged could include afforestation and protection of marine phytoplankton from pollution. This task is to evaluate the side benefits of likely sink policies, e.g. reduced soil erosion, enhanced biodiversity, protected phytoplankton, and better timber management.

VI. Bridging from piecemeal to comprehensive approaches

(A) Addressing the objection that the comprehensive approach is technically difficult or infeasible

As discussed in the introduction, the comprehensive approach can be applied to assist in design of various policies, including research strategies, technology development strategies, enumeration of steps justified on other grounds, and emissions limitation strategies. For most of these options, the comprehensive approach can be applied immediately, despite potential uncertainties, as a general guide to intelligent analysis of the scope and relative importance of policy choices.

For implementing emissions limitations, however, prompt application of the comprehensive approach might be somewhat more difficult. In principle, a comprehensive approach appears to be the most appropriate way to design any emissions limitation policy. But as indicated above, there are noteworthy gaps and uncertainties in the information on emissions of certain gases from certain sources and uptake by certain sinks. If emissions limitations were to be imposed today, a fully comprehensive approach would not be available. If emissions limitations are not needed immediately, work on the comprehensive approach can continue toward a time when limitations might be agreed. If emissions limitations are to be agreed at some point before all informational gaps are filled, a partially comprehensive approach could be employed with a mechanism for moving to a fully comprehensive approach as these gaps are filled.¹⁶

The issue for policy makers is not whether the comprehensive approach is "feasible," but whether at any point the social costs of implementing an incompletely comprehensive approach -- in terms of environmental effectiveness and economic efficiency, as

¹⁶Yet it must be recognized that piecemeal approaches, once adopted, generally attract vested interests who resist any efforts to expand toward a comprehensive approach.

described in section V above -- are outweighed by the social costs of obtaining additional information (including costs of delay). Such costs would also include transactions costs and administrative costs. In other words, one must ask whether the marginal value of additional information (leading to a more comprehensive approach) exceeds the marginal cost of obtaining additional information. Another way of examining the issue is to ask at what point would one know enough to proceed comprehensively; and to ask how (and at what cost) a comprehensive approach could evolve from incremental steps. Further, one would consider institutional means to incorporate incentives into any partial strategy that encourage evolution toward a comprehensive approach.

The scientific building blocks of the comprehensive approach are described above in sections I-III. Any framework convention should foster scientific research through a comprehensive approach. In addition, consideration of the need to bridge from a partial to a comprehensive approach would include:

-- Future work:

- Assess the time and expense needed to answer scientific questions, develop proxy measurement devices, and build monitoring capabilities to achieve a workable comprehensive approach.
- Assess other constraints to employment of a fully comprehensive approach, including institutional, political, cultural and economic obstacles.
- Compare the costs of acquiring this needed information to the socioeconomic and environmental costs (and foregone benefits) of adopting a piecemeal policy design for want of such information.
- Develop policy and institutional designs that offer incentives for needed research. For example, an emissions limitation obligation in an international agreement could be framed in a piecemeal fashion but offer the opportunity to emitters to achieve compliance through limitation actions addressing other GHGs, sources or sinks, so long as the emitter demonstrates the accomplishment. This would give emitters incentives to undertake the research needed to develop new monitoring capabilities.
- Consider intermediate approaches such as incremental or phased-in designs toward comprehensivity, and means to bridge from them to a fully comprehensive approach.

Overview: Priority: high. Timeline: 3 to 18 months.

(B) Integrating prior and concurrent law and policies into a comprehensive approach.

Even if a fully comprehensive approach were available for use in emissions limitations at any relevant point, it is apparent that other treaties, laws and policies will already be addressing discrete RATGs, sources, and sinks. Some means would be needed to accommodate and integrate these diverse endeavors into the comprehensive approach. Several options are available for such integration. One option is to use a comprehensive approach to net RATGs in any emissions limitation protocol while varying the baseline of allowed credit according to prior treaty obligations. Another option is to have the convention mandate that any future protocol (if any) employ a comprehensive approach. A related option is to incorporate in a framework convention on climate the assurance to nations, in advance of any hypothetical future protocol obligations (not yet agreed to), that they would receive credit against any such obligations for current or past (after a certain date) net emissions limitations actions, whether taken pursuant to treaties or national policies; the convention would further calculate the value of such actions according to the comprehensive approach. This would assure credit for measures justified on other grounds, avoid disincentives to those actions, and give root to the comprehensive approach, while not yet committing to emissions limitations obligations.

-- Current Administration efforts:

- devising means to ensure that international agreement integrates (gives credit for) current actions, other international agreements (forestry, VOCs, GHGs covered by ozone agreements), other domestic laws and initiatives. (DOJ, EPA, State)

-- Future work:

- Demonstrate incentive advantages of integration
 - lack of integration would yield perverse disincentives to take actions, even actions that are justified on other grounds, lest they be denied credit once emissions limitations are agreed. Priority: high. Timeline: 3 months.
- Address possible overclaiming (see "monitoring" and "verification," above). Priority: medium. Timeline: 18 months.
- Analyze advantages for other nations under integrated design. Priority: high. Timeline: 3 months.
- Analyze environmental advantages of integration. Priority: medium. Timeline: 3 months.
- Address issues of legal grafting presented by terms or design of other agreements, laws. Priority: high. Timeline: 3 months.

- Consider possible offset model (e.g. defining any limitation obligations in terms of CO2 emissions, to satisfy those eager for CO2 limits, but authorize offsets for any verifiable limits on any GHG, source, or sink, thus effectively constructing a comprehensive approach). Priority: medium. Timeline: 3 to 18 months.

Research and Analysis Underlying the Incentives Approach

As described in the Introduction, a variety of market-based incentives might be considered in the climate change context. The possible uses and advantages of these approaches are summarized in the Introduction.

I. Emissions trading

(A) Domestic trading

-- Current Administration efforts:

- review of past and current experience, e.g. lead phasedown, netting/bubble/offset program, CFCs trading, new acid precipitation trading scheme. Primarily EPA, DOE, CEA.
- consider application to GHGs; consider issues of implementation, e.g. informal versus formal trading; who would trade; duration of allowances; means of distributing allowances; market power; hoarding; scope of GHGs, sectors, sources and sinks; monitoring trades; etc.

-- Future work:

- Evaluate the comparative cost-effectiveness of emissions trading and command-and-control approaches. Priority: high. Timeline: 3 to 18 months.

(B) International trading

-- Current Administration efforts:

- present US experience and suggestions at international discussion on application to climate

-- Future work:

- Extend analysis of above issues to international context, e.g. informal versus formal trading; who

would trade; duration of allowances; means of distributing allowances; market power; hoarding; scope of trading among GHGs, sources, sinks, sectors, industries, geographical areas, stages of development; monitoring trades. Priority: medium. Timeline: 3 to 18 months.

- In addition, consider international institutions; trade, assistance and national income implications; sovereignty issues; cultural or ethical objections to so-called "selling the right to pollute"; trading as a decentralized, market-based vehicle for resource and technology transfers.¹⁷ Priority: medium. Timeline: 3 to 18 months.

- Assess informational, administrative, and other transactions costs of emissions trading and command and control policies. Priority: medium. Timeline: 3 to 18 months.

- Identify opportunities for cross-national trades, and hence likely trading partners (for the US and worldwide). Priority: high. Timeline: 3 months.

- Evaluate the comparative cost-effectiveness of emissions trading and command-and-control approaches. Priority: medium. Timeline: 3 months.

II. Emissions fees

Fees might be employed domestically or internationally to address GHG emissions. Options discussed to date include carbon taxes based on the carbon content of energy fuels, and energy taxes. Other options include an energy sector tax that covers both CO₂ and CH₄ emissions from energy activities, using their GWP index ratings to weight the tax; and a more general multi-sector tax calibrated to the GWP index (or full environmental impacts index) rating of each gas.

-- Current Administration efforts:

- analysis of energy sector taxes in DOE/NES
- analysis of various fees in EPA "Comprehensive Budget" analysis
- related efforts: numerous studies have used assumed taxes to examine costs of GHG limitations policies. E.g. CBO (Montgomery), Manne & Richels, Nordhaus. See CEA overview of Economics of Global Change.

¹⁷ In addition, consider the options for trading within regional associations such as OECD, EC, ASEAN. Evidently the EC and OECD are both considering association-wide policies.

-- Future work:

- Improve assessment of tax implications. Consider international fuels market impacts; use general equilibrium models; address fiscal concerns. Priority: high. Timeline: 3 months.
- Consider variety of tax policy designs, including, carbon, energy, GWP within energy sector, etc. Priority: high. Timeline: 3 months.
- Much of this kind of consideration must be deferred to budget negotiations.

III. Adaptation Incentives

Market mechanisms and institutional reforms could be used to encourage efficient adaptation practices. Because of current institutional or market failures, long-range investments, such as coastal construction or water use planning, might be undertaken without giving appropriate weight to any climate change risks (e.g. rising sea levels or shifting precipitation). Such institutional or market failures might be addressed by informational or incentive-based policies, such as requiring coastal construction to purchase subsidence insurance, or encouraging long-range water use planning to take account of potential precipitation patterns. Some of these types of policies were addressed in the IPCC/RSWG RUMS and CZMS reports.

IV. Economic instruments in general

-- Future work:

- Pursue contacts with OECD regarding Environment Ministerial in January, Economic Instruments analytic workplan (experts meeting now tentatively slated for October 1990), and potential OECD Workshop on Economic Instruments.¹⁸ Priority: high. Timeline: 3 to 18 months.
- Develop suggestions for economic analysis and study of economic instruments in upcoming IPCC Future Workplan discussions (tentatively slated for December or January). Priority: high. Timeline: 3 to 18 months.

¹⁸ Preparing for the suggested OECD Workshop on Economic Instruments, tentatively slated for December 1990, will involve considerations of forum and cosponsorship, logistics and timing, relation to other OECD meetings, relation to other international meetings, invitees, topics to address, an October experts meeting, relation to the upcoming IPCC meeting on Future Work of the IPCC, and US presentation(s) at the December Workshop.

- Continue to work with CEES groups, including the new Ad Hoc Economics task group, to develop economic analysis of policy proposals and designs (addressing "comprehensive approach" issues as well as "incentives" approach issues). Priority: high. Timeline: 3 months to 5 years.

(Submitted to Global Change Strategy Group, Oct. 3)

October 2, 1990

TASK FORCE ON COMPREHENSIVE AND INCENTIVES
APPROACHES TO CLIMATE

RESEARCH AND ANALYSIS PRIORITIES FOR THE NEXT THREE MONTHS

1. Assist State in drafting a possible framework convention that
 - includes a science research section that addresses all GHGs, sources and sinks;
 - provides for an international monitoring agenda for all GHGs, sources and sinks
 - adopts or provides for development of a GHG index based on the radiative forcing and other environmental effects of all GHGs, and possibly incorporating radioactively active trace gases (e.g. sulfate aerosols)
 - provides that any protocol(s) shall, to the extent feasible, be comprehensive.
 - provides that any limitation protocol(s) shall (a) provide for voluntary trading among nations in net GHG reductions (b) provide "credit" for net GHG reductions achieved by nations unilaterally through measures justified on other grounds, or through other international, regional, or bilateral agreements (e.g. forestry).
2. Develop an improved GHG index and an international process for refining the index. Include, to the extent possible, environmental effects other than radiative forcing.
3. Develop a plan for developing an international net GHG monitoring system.
4. Prepare "crisp retorts" to proposals for piecemeal measures by pointing out the environmental and economic drawbacks of agreements limited to particular GHGs, sources and sinks, sectors, or groups of nations, or that use command and control approaches. These also apply to congressional proposals.
5. Develop quantitative analysis and empirical examples to show the environmental and economic advantages of a comprehensive approach.

6. Update "report card" on the contributions to reducing net of US actions being taken on other grounds. Conduct similar analyses for selected other nations.

7. Development of a concise but sophisticated vision of decision making under uncertainty to counter simplistic versions of the "precautionary principle."

8. Develop capacity to analyze economic and environmental costs and benefits of likely proposals by other nations.