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U.S. House of Representatives
Committee on Commerce

Room 2125, Rayburn House Office Building
Washington, DC 20515-6115

August 22, 1997

file rec'd
8-25
H. J.
JAF
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The Honorable Janet Yellen
Chair
Council of Economic Advisors
Old Executive Office Building
Washington, D.C. 20502

Dear Ms. Yellen:

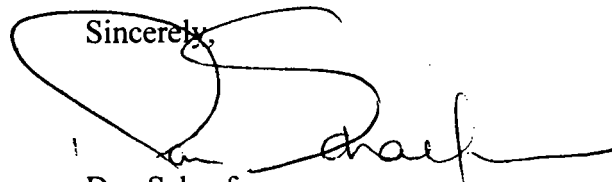
On July 15, 1997, you presented the Administration's views on the economic and environment impact of the proposed international global climate change agreement before the Energy and Power Subcommittee. On behalf of the members of the Subcommittee, I thank you for your informative testimony. The hearing was indeed enlightening.

With the conclusion of the eighth meeting of the Ad Hoc Group on the Berlin Mandate, I see significant benefit to a round of follow-up questions to clarify, for the record, some of the issues that were raised during your testimony and the question and answer session that followed.

Attached is a list of questions for you to answer on behalf of the Administration. I ask that you work with the other relevant departments and agencies in developing responses and providing the relevant documentation where requested. Your responses will be entered into the record in the same manner as your original testimony. Your responses would be appreciated on or before September 22, 1997. If you have any questions, please call Cathy Van Way at (202) 225-2927.

Thank you for your continued attention and assistance to the matter.

Sincerely,



Dan Schaefer
Chairman
Energy and Power Subcommittee

Attachment

The Honorable Janet Yellen

August 22, 1997

Page 2

cc: The Honorable Tom Bliley, Chairman
The Honorable John Dingell, Ranking Member
The Honorable Ralph Hall, Ranking Member
Subcommittee on Energy and Power

SUBCOMMITTEE ON ENERGY AND POWER
HEARING ON GLOBAL CLIMATE CHANGE
FOLLOW-UP QUESTIONS

Interagency Analytical Team Report

1. Please identify each member of the Interagency Analytical Team (IAT) from the date of its inception to the present time, any other participants inside or outside the Administration, and specify their responsibilities.
2. When was the IAT formed and what were the IAT's instructions? Please provide any documentation regarding the formation of the IAT and its mission, responsibilities, membership or assignments.
3. Please indicate the total costs of the IAT's efforts and the share paid annually by each Department or Agency that was involved and please identify the source of the funds within each Department or Agency.
4. Is the IAT still in existence? If so, what are its current responsibilities?
5. Please provide a copy of all drafts of the IAT report in addition to the May 16 and 30, 1997 drafts, both earlier and later.
6. Please explain how the peer reviewers were selected? What instructions were those peer reviewers given? Please provide copies of any correspondence or instructions that were sent to the peer reviewers.
7. If the IAT effort is in fact a "failed" project as indicated in Administration testimony at the Subcommittee hearing how will the Administration determine the appropriate level of future international climate change commitments for Kyoto and later?
8. As late as last May when Dr. Ehrlich and others in the Administration held briefings on the then draft analysis and assessment there was no hint that the Administration considered this effort a failure and the models to be unreliable. What occurred since May that caused the Administration to apparently reach a different conclusion from that of Dr. Ehrlich?
9. The IAT draft analysis referred to three scenarios which resulted in costs of future climate commitments of approximately \$200, \$100 or \$50 per ton carbon tax equivalent. Has the Administration concluded that a \$200 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness? Has the Administration concluded that a \$100 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness? Has the Administration concluded that a \$50 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness. Please provide the basis for any of the above conclusions. If the Administration does not support any of the above costs, what analysis or other information does the Administration intend to rely on to support a different amount?

10. Is the paper prepared by the IAT both an analysis and assessment? How does it relate to the "analysis and assessment" referred to in Paragraph 4 of the Berlin Mandate? Has the Ad Hoc Group on the Berlin Mandate provided an analysis and assessment as required by the Berlin Mandate?
11. The IAT draft states that the central policy modeled for the analysis "is aimed at reducing carbon and other greenhouse gas emissions by stabilizing them at 1990 levels" and that policy would be "announced in 2000 and its restrictions are phased in over a ten year period, so that the policy would take full effect in 2010." Reports in the media after the Denver Summit that President Clinton attended also referenced this date of 2010. In light of EIA's projection of emissions 22% above 1990 levels by 2010, is the Administration considering a target and timetable that calls for stabilization at 1990 levels by 2010?
12. The Administration frequently cites the 2000 economists who say they support controlling greenhouse gases. Their statement supports as the mechanism either carbon taxes or emission permits. In the past, the Administration has said it opposes the use of taxes. Is that still the Administration's position?
13. The IAT draft explains that these emission reductions to achieve stabilization would be through "issuing tradable permits at the earliest point of energy production or when imported into the U.S." and that the permits "are initially auctioned in a way that is revenue neutral: i.e., all revenues generated would be recycled through the economy." Would these revenues be deposited in the treasury as miscellaneous receipts under the Economy Acts? Would they then have to be recycled through changes in the tax laws or by appropriation? How would they be recycled?
14. Does the Administration believe that permit auctions are the equivalent of a new tax? If not, please explain.
15. The IAT draft states that "among fuels, demand for coal bears the brunt of greenhouse gas stabilization." What is the impact on the U.S. economy as a whole and on the relevant coal regions of this policy towards coal? What will be the job impact? Is the Administration adopting an anti-coal policy? How is this policy consistent with President's Clinton 1995 reply to Mr. Dingell that the U.S. will not agree to any protocol that harms our economy and jobs or our competitiveness?

Kyoto Agreement

16. How long after December 1997 does the Administration think it will take to obtain Senate advice and consent of any Kyoto agreement, to ratify that agreement, and to enact implementing legislation?
17. Which Agency or Department would be responsible for implementing the provisions of any agreement reached in Kyoto, including provision relating to joint implementation, emissions trading, and advancing Article 4.1?

18. What consideration has been given or plans made regarding passage of legislation necessary to implement any agreement reached in Kyoto?

U.S. Draft Protocol

19. Article 17.4 of the Framework Convention on Climate Change (FCCC) specifies that only "Parties to the Convention may be Parties to a protocol." However, there is no assurance that all or even a majority of the 167 Parties to the FCCC will deposit instruments of ratification, acceptance, approval or accession to any protocol adopted by the Parties by consensus or otherwise in Kyoto. What assurances does the U.S. now have that most, if not all, developing country Parties to the FCCC will become Parties to a Kyoto protocol? Why is it in the U.S. interest to agree, without such assurances, to a protocol that proposes to set legally binding post-2000 targets and timetables for Annex I Parties only and also imposes on the U.S. new and legally binding commitments to advance implementation of Article 4.1. of the FCCC, such as those prescribed in paragraph 1, 2, 3, and 4 of Article 5 of the U.S. draft protocol?
20. In a July 18, 1994 letter to the then House Committee on Energy and Commerce, [the State Department] said:
- We agree that there are substantial commitments beyond 2000 for all parties to the Framework Convention under Article 4. Article 4.1 (applicable to both developed and developing countries) contains commitments that are not limited by any specific timetable.
- a) Is there any evidence to date that the U.S. is not abiding by these Article 4.1 commitments? If there is none, why should the U.S. voluntarily agree to reaffirm, as required by Article 5.1 of the June draft, to what the U.S. already agreed to when it ratified the FCCC in 1992?
- b) Is the U.S. asserting that other Annex I Parties are not abiding by such commitments? If so, please identify those Parties.
21. Paragraph 2 of Article 5 of the U.S. draft Protocol mandates each Party to "strengthen its legal and institutional framework to advance implementation" of Article 4.1 commitments. What "framework" does the Administration have in mind? Does this suggest a new Federal or international agency or program? Would this be done through new legislation? If not, how would it be achieved in the U.S.?
22. Article 5.3 requires that each Party take "measures to facilitate investment in climate-friendly technologies." What "measures" does the Administration contemplate? How would they be implemented in the U.S.? What are their regulatory and budgetary implementations?
23. Article 16 of the draft provides that the Parties "shall adopt, by [2005], binding provisions so that all Parties have quantitative greenhouse gas emissions obligations and so that there

is a mechanism for automatic application of progressive greenhouse gas emissions obligations to Parties, based upon agreed criteria.”

- a) Does this mean that there could be a second protocol or another legal instrument by [2005] which is only 7 years after the December meeting in Kyoto?
 - b) Do the words “all Parties” in this Article mean that only the “Parties” to the U.S. draft protocol would be required to “adopt” by 2005 such an instrument? Unless developing country Parties to the FCCC, such as China, India and Brazil, become Parties to the Kyoto instrument (as proposed by the U.S.) prior to [2005], how does this Article address the issue of greenhouse gas emission growth by all non-Annex I Parties?
 - c) Could such a new instrument adopted by [2005] impose new and additional obligations on the U.S. beyond those proposed to be adopted in Kyoto? Why is that possibility a good result for the U.S. economy, trade, and competitiveness?
 - d) What “mechanism for automatic application of progressive greenhouse gas emissions obligations” does the Administration contemplate by this proposal? What are its implications for the U.S., including its sovereignty?
24. Article 16.1 of the Convention provides that “annexes shall be restricted to lists, forms, and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.” The U.S. draft protocol states, that it may not be “appropriate” to adopt the Article 16.1 Convention example. Please explain why. Does the U.S. support annexes that would be substantive and mandatory?
25. Article 9 of the U.S. draft provides that Parties “shall cooperate” in establishing a “long-term goal” regarding concentrations of gases. Article 10 calls for meetings at “regular intervals” to, among other things, “periodically review the adequacy” of the Protocol and Article 8 calls for periodic review of the Protocol and guidelines “in light of evolving scientific knowledge related to climate change.” Article 2 already suggests a minimum of two budget periods. Article 16 tells the Parties to adopt “binding provisions” by [2005] for progressive “obligations.” Does the State Department contemplate over the next several decades a continuing process of meetings of both the Protocol and Convention Parties annually and a series of IPCC assessments, special reports, and technical papers, leading to a series of protocols or other legal instruments that are likely to have significant economic impacts on the Parties and their people? Why is there a need for such frequent meetings and reviews?
26. The Global Climate Coalition sent a letter to the Department of State on February 14, 1997 raising a number of questions about the January 17, 1997 version of the U.S. draft protocol, particularly in regards to trading. The Administration has not yet responded to those questions. Please respond to them as part of your reply to this inquiry.

EU Bubble

27. The EU proposal made recently in Denver was developed last March as an EU “negotiating position for the ongoing negotiations on the Berlin Mandate” and it includes burden-sharing of a 10% reduction among EU members of the “overall emission reduction objective by the Community as a whole”. This appears to be a form of differentiation, a concept the U.S. is not supporting. The existing FCCC bubble applicable to the EU presumably only covers policies and measures and, when adopted, it only covered the 12 Parties that were members of the EU in 1992. Does the U.S. understand that the EU is seeking, by its submissions and discussion with the U.S. delegation, to extend a form of the FCCC bubble to a protocol and another legal instrument that may be adopted in Kyoto, to expand the bubble to cover any target and timetable or financial obligations and not just policies and measures, and to expand the bubble to include all present and future members of the EU, such as countries from Central and Eastern Europe? Why is such an expanded bubble in the economic and competitive interests of the U.S.?
28. What is the potential impact of such an expanded EU bubble on the U.S. proposal for international emissions trading? Would it ensure that the EU would get the benefit of any emissions deficit derived from such Central and Eastern European Members and deprive the U.S., Japan, Australia and Canada of that deficit? Would the U.S. then have to rely primarily on Russia’s emissions deficit in order to derive any of the benefits of trading?
29. Article 22.3 of the FCCC requires that regional economic integration organizations must declare the “extent of their competence” with regard to obligations under the FCCC. Does the U.S. believe that the EU has the competence to carry out legally binding targets and timetables and to enforce any differentiated targets for its members if they fail to achieve them?
30. The State Department’s September 9, 1996 reply to the Committee stated that the U.S. did not agree to an “EU Bubble in Berlin” and that the U.S. delegation “successfully opposed including language in the Berlin Mandate which might have suggested that any country or group of countries could “bubble” in the post-2000 period.” The reply then said:

Clearly, the question of “bubbling” with respect to post-2000 commitments is complex, and one that will be closely scrutinized and carefully considered as negotiations progress. The Administration has consistently and continuously consulted with Congress, as well as with U.S. industry and U.S. NGOs, on all aspects of the negotiations concerning post-2000 commitments and will continue to do so.

The Administration has not yet held meaningful discussions with this Committee on the issue of the EU bubbling to “meet and target and timetables,” its implications for the U.S., its merits, or its complexities. Given the fact that negotiations are just approaching a conclusion in Bonn and Kyoto, when do you plan to consult us on this aspect of the negotiations?

31. Since 1992, the composition of the only “regional economic integration organization,” namely the EU, has grown from 12 to 15 members and several other countries want to expand it further. Under what circumstances would the U.S. agree to an EU bubble that is or could be expanded?

EU Amendment to Convention

32. The EU has proposed an amendment to the Convention to provide for a vote to adopt all future protocols by three-fourths if all efforts at consensus are exhausted. The proposed amendment would appear to have a retroactive effect for Kyoto.
- a) Under this proposal, is it possible that three-fourths of the FCCC Parties could vote to “adopt” any Protocol that imposed new obligations for Annex I and/or non-Annex I Parties and then decide not to deposit an instrument of ratification, etc.?
 - b) Does the U.S. support such an amendment to the Convention?
 - c) Has the U.S. position changed from its June 19, 1996 response to this Committee in regards to any of these matters? Would the Administration agree to a resolution of one of these matters, namely voting on a protocol, without a resolution of the financial and budget matters for both the Convention and all future protocols?

Emissions Trading

33. Does the Administration intend that any international emission trading program would apply in the same way and to the same extent to public and private entities internationally and in the U.S.? For example, would it apply to local governments and to defense or other agencies of each Party and to the emissions of such entities? What will be the impact on the U.S. Defense Department of an international, or, for the matter, a domestic, emissions trading program?
34. Greenhouse gases not covered by the Montreal Protocol are not pollutants within the meaning of the Clean Air Act and are not subject to the command and control provisions of the Act or other environmental laws. It is our understanding that although the U.S. has cited (in a September 9th reply to this Committee) authority to implement the Climate Change Action Plan with voluntary measures, the U.S. draft protocol, because it may call for mandatory measures, could not be given full effect in the U.S. without the enactment of new legislation by Congress. Do you share that understanding? Is the Administration considering a domestic emission trading legislative program patterned on the 1990 Clean Air Act?

General

35. I understand that the Administration has recently established the White House Climate Change Task Force, a Deputies Group and an Assistant Secretaries group. Please explain the role and purpose of each in regards to the development of the Administration's position and policies for the international negotiations for a protocol or another legal instrument in 1997 and for the development of implementing legislation in the U.S. Please identify the members of each group. Please provide any documents regarding the formation of these groups, their membership, mission, tasks, and/or assignments.
36. Please provide a table of all contracts, cooperative agreements, grants, and interagency agreements and any extensions thereof (hereinafter referred to as "agreements") entered into with any individual, agency, or public or private entity (foreign or domestic) by or through any federal Department or Agency, including the Departments of State, Commerce and Energy, and the Environmental Protection Agency, for the period beginning July 1, 1994 to the present that relates to, or includes, (directly or indirectly) climate change matters or issues of any kind. These should include matters relating to (a) domestic or international emission trading, including economic and other analysis of such trading, the administration and verification of such trading in the U.S. and elsewhere, (b) public outreach, general and specific public education, grass roots, community outreach, workshops, (c) transportation efficiency, alternative fuels, transportation generally, utilities, impact on pollutants like ozone and particulate matter, and (d) any legal analysis of these matters and of the Convention or of any statutes concerning climate change or trading. Each table should identify the date of the agreement, the agreement recipient, the amount of Federal funds, the term, including extensions, a brief description, the product and whether it is publicly available, and the status. Please include with each table the applicable "Statement of Work", including any revision thereof, for each such agreement.

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United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

WASHINGTON, DC 20510-6175

July 14, 1997

Dr. Janet Yellen
Chair, Council of Economic Advisers
Old Executive Office Building
Room 314
Washington, D.C. 20502

Dear Dr. Yellen:

On behalf of the Committee on Environment and Public Works, we would like to invite you to testify on Thursday, July 17, 1997, at a hearing before the full committee. The purpose of this hearing is to receive testimony on the policy of the United States toward proposed modifications to the 1992 Framework Convention on Climate Change. The hearing will be held in Room 406 of the Dirksen Senate Office Building, and will begin at 10:00 a.m.

In order to maximize opportunity for members of the Committee to discuss this matter with you and other witnesses, we are asking that your oral testimony be limited to five minutes. Your written testimony can be comprehensive, and it will be included in the printed record in its entirety, together with any other materials you would like to submit.

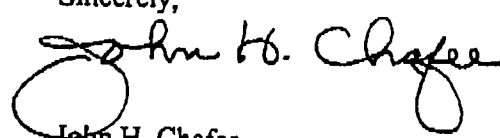
To comply with Committee rules, please provide one hundred copies of your testimony forty-eight hours in advance of the hearing. Testimony should be sent to the attention of Mr. Justin Brown, Senate Committee on Environment and Public Works, 415 Senate Hart Office Building, Washington, D.C., 20510. If possible, please provide the Committee with a copy of your testimony on a 3.5-inch disk in a WordPerfect file.

If you have any charts, graphs, diagrams, photos, maps, slides, models, or other exhibits that you intend to utilize at the hearing, please provide one identical copy of such material(s), as well as one hundred reduced copies (8.5 x 11") of such materials no later than forty-eight hours prior to the hearing. Exhibits or other materials described above that are not provided to the Committee within forty-eight hours cannot be used for the purpose of presenting testimony to the Committee.

Dr. Janet Yellen
July 14, 1997
Page two

If you have any further questions or comments, please feel free to contact Mr. Dan Delich at (202) 224-5762 or Ms. Barbara Roberts at (202) 224-2969. We look forward to seeing you on July 17.


Max Baucus

Sincerely,

John H. Chafee

THE WHITE HOUSE**OFFICE OF LEGISLATIVE AFFAIRS
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7/14/97

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Staff Memo

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U.S. House of Representatives
Committee on Commerce
 Room 2125, Rayburn House Office Building
 Washington, DC 20515-6115

SUBCOMMITTEE ON ENERGY & POWER

DATE: Tuesday, July 15, 1997

TIME & PLACE: 1:00 p.m., 2123 Rayburn House Office Building

SUBJECT: The Economic Impact of the Proposed International Global Climate Change Agreement

WITNESS LIST

The Honorable Timothy E. Wirth
 Under Secretary for Global Affairs
 U.S. Department of State
 2201 C Street, N.W.
 Washington, D.C. 20520

The Honorable Janet Yellen
 Chair
 Council of Economic Advisors
 Old Executive Office Building
 Washington, D.C. 20502

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U.S. House of Representatives Committee on Commerce

Room 2125, Rayburn House Office Building
Washington, DC 20515-0115

July 14, 1997

Memorandum to: Members, Subcommittees on Energy and Power
From: Catherine G. Van Way, Counsel
Re: July 15, 1997 oversight hearing on Global Climate Change

On Tuesday, July 15, 1997, the Subcommittee on Energy and Power will conduct its first oversight hearing on global climate change in the 105th Congress. In the 104th Congress the Subcommittee held four hearings on this topic. The hearing will focus on the upcoming Sixth meeting of the Ad Hoc Group on the Berlin Mandate (AGBM) and the impact a future global climate change agreement is likely to have on the environment and the U.S. economy.

Witnesses:

There will be two witnesses: Tim Wirth, Under Secretary for Global Affairs, and Janet Yellen, Chair of the Council of Economic Advisors (CEA).

Background

In June, 1992, in Rio de Janeiro, the U.S. along with approximately 160 other countries signed the Framework Convention on Climate Change (Climate Treaty). The Treaty entered into force on March 21, 1994. The Climate Treaty's ultimate objective is to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level which would prevent dangerous anthropogenic interference with the climate system". The Climate Treaty seeks to achieve that objective through its aim for developed countries to return emissions of greenhouse gases to 1990 levels by the year 2000. Importantly, the treaty did not address what was to happen with respect to greenhouse gas emissions after the year 2000.

At the first Conference of the Parties (COP1) to the Climate Treaty held in April 1995, in Berlin an agreement to negotiate new commitments for Annex 1 parties (i.e. developed nations) was made. (Attachment 1 is a list of Annex 1 parties.) Specifically, this Berlin agreement, called the "Berlin Mandate", established a process for the parties to "set quantified limitation and reduction objectives within specified time-frames, such as 2005, 2010 and 2020, for their anthropogenic emissions...." Since April of 1995, the Ad Hoc Group on the Berlin Mandate has met several times

to discuss how to achieve these goals. The work of the AGBM is expected to conclude with an agreement being reached by the meeting of the Third Conference of the Parties is scheduled to be held in Kyoto, Japan in December of 1997.

The Second Conference of the Parties occurred in July, 1997 in Geneva, Switzerland. Several key decisions on the outcome of the remaining negotiations under the Berlin Mandate process were reached. A Ministerial Declaration (attachment 2) established the objectives for the remaining negotiations.

Issues Raised by the Ministerial Declaration

The most significant action taken at COP2 was the development of a Ministerial Declaration instructing negotiators "to accelerate negotiations on the text of a legally-binding protocol or other legal instrument to be completed in due time for adoption at the third session of the Conference of the Parties" (December 1997). The Ministerial Declaration further stated that the outcome of the negotiations should include commitments for Annex 1 parties (developed countries) regarding "quantified legally-binding objectives for emission limitations and significant overall reductions within specified timeframes, such as 2005, 2010, 2020...." Developing countries are not required under this agreement to negotiate any quantifiable emission reductions for themselves. The Clinton Administration was key in getting the concept of "legally binding" emission limitations included as part of future negotiations.

Since COP2, the U.S. and other nations have submitted their proposals for adoption in Kyoto. The range of options for future carbon emissions reductions range from reducing greenhouse gas emissions 20% below 1990 levels by 2005 to growing emissions 43% above 1990 levels. The U.S. proposed its own protocol which, among other things, called for emissions trading among developed and developing nations and commitments by developing countries to be bound in a more meaningful way in future negotiations. Importantly, while the U.S. draft protocol assumes targets and timetables for greenhouse gas emissions reductions it did not include a specific numeric target or timetable.

There are several issues raised by the Ministerial Declaration and Berlin Mandate process which could negatively impact U.S. interests. The first is an environmental concern. The treaty and whatever new agreement is negotiated will set quantifiable emission limitation reduction objectives (QELROS) for Annex 1 parties only. Not only are no developing countries called upon to reduce their emissions, they are not even asked to limit future growth in emissions. While most developing countries have extremely low emissions that aren't expected to grow significantly in the future there are big exceptions. Major U.S. trade competitors such as China, India and Mexico already have significant emissions that are expected to grow rapidly over the next twenty years. A perverse result of the Treaty and future agreements may be that the U.S. will export its emissions and jobs to other countries rather than its goods or services. For example, if the agreement reached as a result of these negotiations requires U.S. industry to reduce emissions significantly in a short time frame, industries which can move to other countries may make the decision to relocate to those countries to take advantage of lower labor and environmental costs. The result will be a loss of jobs and industry to the U.S. with no or perhaps negative environmental impact.

Another issue raised by the Ministerial Declaration is the timeframe for achieving the agreement. An agreement on the level of emissions reductions to be made by developed countries is expected to be reached by December, 1997. This gives the U.S. less than six months from today to negotiate an agreement which could bind the U.S. for the next ten to twenty years. The short timeframe is especially disturbing when the Administration has not yet completed its analysis and assessment of what kind of agreement is achievable or realistic for the United States. It is also disturbing considering that there are only about three weeks worth of negotiating sessions scheduled between now and the time an agreement is supposed to be concluded.

Timing is also an important consideration from the perspective of how quickly reductions are achieved. The larger the reduction and the shorter the timeframe, the more expensive it will be to achieve the emissions reductions. (See discussion below on the draft analysis and assessment.) This occurs for a number of reasons including, the fact that it forces the premature retirement of plants and other facilities and does not give adequate time for the development of cost-effective emission reduction technology. On its face, the Ministerial Declaration made in Geneva directs negotiators to consider reductions timetables beginning in 2005. The U.S. delegation has declared its support for medium and long-term reduction goals which would exclude significant reductions in 2005. However, it is unclear what actual time-frames are being considered by the Administration and a plain reading of the Ministerial Declaration indicates that the possibility of requiring emission reductions as early as 2005 is still on the table.

Another concern is the importance the Administration placed on pursuing "legally binding" commitments to reduce greenhouse gas emissions. Technically, the Rio Treaty is "legally binding" on the U.S., but its specific aims are largely "aspirational". Thus, it is unclear what is meant by the term "legally binding" and how such an agreement would be enforced. The Administration seems to be seeking not only a legally-binding agreement, but making any specific emission reduction target agreed to by the parties legally-binding. It would be worthwhile to probe whether there is any legal or other significance to this distinction.

Similarly, concerns have been raised about the level of commitment of the Administration to the proposal contained in its draft protocol to bring developing countries into the climate change agreement in a more meaningful way. While, the Administration's proposal to bring developing countries into future negotiations was welcomed by most in U.S. industry, skeptics believe it will be the first thing the U.S. backs away from in the negotiation.

Economic Analysis and Assessment

At the last hearing the Subcommittee held on this topic in the 104th Congress, Dr. Everitt Erlich, Under Secretary of Commerce for Economic Affairs, testified that the Administration would have completed its analysis and assessment on the impacts of global climate change commitments by the end of 1996 or early 1997. In mid-May, 1997, the Administration circulated a draft of its proposed analysis and assessment to a group of peer reviewers selected by the Administration. Those peer reviewers were given approximately two weeks to review and submit comments on the draft analysis and assessment. The Administration has now had those peer review comments for nearly six weeks, however, indications are that the final analysis and assessment is unlikely to be released soon.

A copy of the draft analysis and assessment has become available to the Committee from sources other than the Administration. (Copies of the draft analysis and assessment can be obtained from the Committee.) Among other things, the draft looked at the costs to the economy of stabilizing emissions at 1990 levels by 2010, growing them to 110% above 1990 levels by 2010, and reducing them to 90% of 1990 levels by 2010. The study concluded that stabilizing emissions at 1990 levels in 2010 would require the equivalent of \$95 per ton of carbon tax. The other two scenarios have lower and higher costs respectively. The study notes that "[a] carbon tax of \$100 per ton is the equivalent of a price increase of 26 cents per gallon of refined petroleum product, \$1.49 per thousand cubic feet of natural gas, \$52.52 per ton of coal, and 2 cents per kilowatt hour of electricity produced." Stabilization at 1990 levels also would lead to an initial GDP loss of about 1% of economic output in 2005 which isn't recovered until 2013. Stabilization also results in an approximately 0.2% point increase in the unemployment rate from 2001 through 2011. The inflation rate increase by about 0.3% until 2009 under a stabilization scenario.

There are numerous questions that can be raised regarding the Administration's analysis and assessment and the peer review process. First, regarding the peer review process: who are the peer reviewers, how were they selected, what instructions were they given (*i.e.* were they just "checking the math" or were they instructed to examine the appropriateness of the assumptions made and models used) and what conclusions did they reach. Second, with respect to the analysis itself: what assumptions and models were used and how were they selected, was there any cost/benefit analysis, were alternatives other than targets and timetables considered, what is the impact of similar reductions on our developed country trading partners (*i.e.* do certain targets and timetables have a disproportionate impact on the U.S.) and what will be the environmental impact of action by developed countries acting alone. Finally, it is appropriate to ask when, if ever, the final economic analysis and assessment will be released.

Conclusion

Since the last hearing by this Subcommittee, the Administration has remained reluctant to give any specific information about where it is headed in the AGBM negotiations. In fact, at that hearing, held less than one month before COP2, the Administration gave Congress no indication that it would seek legally binding emission reductions. This lack of information and candor has caused a great deal of frustration and anxiety to Congress, as well as, environmental, industry and labor groups. This hearing provides another opportunity to question Administration witnesses about the negotiating process and what future commitments the U.S. is prepared to undertake. In addition, this is a good opportunity to explore the impact increased climate change commitments will have on U.S. trade competitiveness, particularly in relation to developing nations. Finally, it would be worthwhile to probe whether the current timetable for concluding negotiations is realistic.

If you have any questions or comments, please call me at extension 5-2927.

Attachments

Attachment 1

Annex I

Australia
Austria
Belarus^{a/}
Belgium
Bulgaria^{a/}
Canada
Czechoslovakia^{a/}
Denmark
European Economic Community
Estonia^{a/}
Finland
France
Germany
Greece
Hungary^{a/}
Iceland
Ireland
Italy
Japan
Latvia^{a/}
Lithuania^{a/}
Luxembourg
Netherlands
New Zealand
Norway
Poland^{a/}
Portugal
Romania^{a/}
Russian Federation^{a/}
Spain
Sweden
Switzerland
Turkey
Ukraine^{a/}
United Kingdom of Great Britain and Northern Ireland
United States of America

^{a/} Countries that are undergoing the process of transition to a market economy.

Attachment II

18 July 1996, 12:00

MINISTERIAL DECLARATION

The Ministers and other heads of delegations present at the second session of the Conference of the Parties to the United Nations Framework Convention on Climate Change,

Noting that this, our meeting at Ministerial level under the Convention, is a demonstration of our intention to continue to take an active and constructive role in addressing the threat of climate change,

1. Recall Article 2 of the Convention; the principles of equity and of common but differentiated responsibilities and respective capabilities in Article 3.1 of the Convention; and the provisions of Article 3.3 concerning precautionary measures; as well as the specific national and regional development priorities, objectives and circumstances of the Parties to the Convention;

2. Recognize and endorse the Second Assessment Report of the IPCC as currently the most comprehensive and authoritative assessment of the science of climate change, its impacts and response options now available. Ministers believe that the Second Assessment Report should provide a scientific basis for urgently strengthening action at the global, regional and national levels, particularly action by Annex I Parties to limit and reduce emissions of greenhouse gases, and for all Parties to support the development of a Protocol or another legal instrument; and note the findings of the IPCC, in particular the following:

The balance of evidence suggests a discernible human influence on global climate. Without specific policies to mitigate climate change, the global average surface temperature relative to 1990 is projected to increase by about 2C (between 1C and 3.5C) by 2100; average sea level is projected to rise by about 50 centimetres (between 15 and 95 centimetres) above present levels by 2100. Stabilisation of atmospheric concentrations at twice pre-industrial levels will eventually require global emissions to be less than 50 per cent of current levels;

The projected changes in climate will result in significant, often adverse, impacts on many ecological systems and socio-economic sectors, including food supply and water resources, and on human health. In some cases, the impacts are potentially irreversible; developing countries and small island countries are typically more vulnerable to climate change;

Significant reductions in net greenhouse gas emissions are technically possible and economically feasible by utilising an array of technology policy measures that accelerate technology development, diffusion and transfer; and significant no regrets opportunities are available in most countries to reduce net greenhouse gas emissions.

3. Believe that the findings of the Second Assessment Report indicate that the continued rise of greenhouse gas concentrations in the atmosphere will lead to dangerous interference with the climate system, given the serious risk of an increase in temperature and particularly the very high rate of temperature change;

4. Recognise also the need for continuing work by the IPCC to further reduce scientific uncertainties, in particular regarding socio-economic and environmental impacts on developing countries, including those vulnerable to drought, desertification or sea-level rise;

5. Reaffirm the existing commitments under the Convention, including those intended to demonstrate that Annex I Parties are taking the lead in modifying longer-term trends in emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, and agree to strengthen the process under the Convention for the regular review of the implementation of present and future commitments;

ATTACHMENT II

6. Take note that Annex I Parties are fulfilling their commitments to implement national policies and measures on the mitigation of climate change. Also take note that this is not the only commitment that Annex I Parties have made and that many of these Parties need to make additional efforts to overcome difficulties that they face in achieving the aim of returning their emissions of greenhouse gases to 1990 levels by 2000;

7. Acknowledge the considerable work done by the Ad Hoc Group on the Berlin Mandate (AGBM) since the first session of the Conference of the Parties, including the substantive proposals presented by a number of Parties, and call on all Parties to come forward with proposals to facilitate substantive negotiations beginning at the fifth session of AGBM in December 1996.

8. Instruct their representatives to accelerate negotiations on the text of a legally-binding protocol or another legal instrument to be completed in due time for adoption at the third session of the Conference of the Parties. The outcome should fully encompass the remit of the Berlin Mandate, in particular:

- commitments for Annex I Parties regarding:

- * policies and measures including, as appropriate, regarding energy, transport, industry, agriculture, forestry, waste management, economic instruments, institutions and mechanisms;
- * quantified legally-binding objectives for emission limitations and significant overall reductions within specified timeframes, such as 2005, 2010, 2020, with respect to their anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol;

- commitments for all Parties on continuing to advance the implementation of existing commitments in Article 4.1;

- a mechanism to allow the regular review and strengthening of the commitments embodied in a Protocol or other legal instrument;

- commitments to a global effort to speed up the development, application, diffusion and transfer of climate-friendly technologies, practices and processes; in this regard, further concrete action should be taken.

9. Welcome the efforts of developing country Parties to implement the Convention and thus to address climate change and its adverse impacts and, to this end, to make their initial national communications in accordance with guidelines adopted by the Conference of the Parties at its second session; and call on the GEF to provide expeditious and timely support to these Parties and initiate work towards a full replenishment in 1997;

10. Recognize that the continuing advancement of existing commitments by developing country Parties, in the context of their national priorities for sustainable development, requires determined and timely action, in particular by Annex II Parties. Access to financial resources and to environmentally-sound technologies consistent with Articles 4.3, 4.4, 4.5 and 4.7 will be most critical;

11. Thank the Government of the Swiss Confederation for its contribution to the work of the second session of the Conference of the Parties in Geneva and look forward to meeting again at the third session in Kyoto, in 1997, thanks to the generous offer of the Government of Japan.

EPA comments on draft Yellen testimony

Bottom p.2-top p.3: The "underlying uncertainties" paragraph is unduly negative, unduly suggestive that we don't know enough to take any action. Replace with the following:

yes
 "Before I begin my discussion of the economics literature, I would like to acknowledge the uncertainties inherent in assessments of the adverse impacts of climate change and the economic consequences of reducing greenhouse gas emissions. We are dealing with physical and economic processes that operate globally and over decades, if not centuries. We do not know precisely which regions will get warmer and which will get cooler; which will get wetter and which will get drier. But this much is certain: The impacts of climate change have the potential to be very large, even catastrophic. Further, these impacts will be for all practical purposes irreversible, given how long greenhouse gases persist in the atmosphere."

But
 "The potential costs of reducing greenhouse gas emissions are also difficult to predict with certainty. But, as I will show in the rest of this testimony, we can estimate the costs of prudent initial actions for the next decade or two decades within reasonable bounds."

Too activist
 "It is important to emphasize that uncertainty cannot be a basis for inaction. If we do nothing, and if the consequences of climate change turn out to be severe, then we will be unable to go back and correct our error. Therefore, it is responsible and necessary to take economically prudent action to bound the risk of that outcome."

Too activist
want to
 page 3: Second line from the bottom, after "staff level group working" add: "under the direction of the Department of Commerce and the White House"

page 4, line 7: After "used," insert the following new sentence.

Too much emphasis on AT
 "In general, the reviewers agreed that the AT draft places too much emphasis on one model that in their view tends to overestimate costs. On other issues, the commenters themselves disagreed, with some reviewers suggesting more emphasis on particular points, and other reviewers suggesting less emphasis on those same points."

page 5: The first bullet is biased in favor of the long-haul. It should be made more neutral, as follows:

yes
 "The speed at which emission reductions are required can have large effects on the estimated costs. It is important to allow sufficient lead-time for orderly investment in new equipment and technology. On the other hand, if emission reduction requirements are too far off in the future, they will be ignored by the private sector."

page 6: second bullet: Replace: "So-called 'banking' and 'borrowing'" with "Multi-year budgets (as opposed to limits that have to be met independently in each and every year)"

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SUBJECT: Comments on CEA Draft Testimony on Climate Change

Overall the testimony as drafted sets a very negative tone for action; it seems critical to provide some of the rationale for action - for which a significant case is made in the economic analysis, but does not show up in this draft. OES/EGC has the following specific comments on the draft testimony of CEA on global climate.

OK p 1. Paragraph 3, add word "new" to top line: "...on a particular set of new policies to reduce..."

NOT Clear that this is some role to this
OK p 2. continuation of paragraph at top of page: This implies that the position could be developed in late November must in time for the December session. We must be clear that a position will be available before then. Modify to read: "which will culminate in a U.S. policy position well in advance of the international negotiations...."

OK p 2. first full paragraph, last sentence: replace "reverse our hard fought progress" with "adversely affect the health of our economy"

took it
OK p 3. section on underlying uncertainties. This is much too strong, and provides no justification of why we should act at all. Add new final sentence as follows: "It is important to recognize that uncertainty is not a basis for inaction. If we do not act, the consequences are potentially severe, and it will be too late to go back and reverse our action. We must take appropriate precautionary measures while we can."

rewritten
OK p 4. Top of page, continued paragraph from bottom of p 3. Add new sentence after sentence of 12 reviewers. "As is often the case, comments varied significantly; for example, some experts believed the analysis overstates the costs of action, and others questioned some of the estimates on the penetration rates of new technology."

NOT TRUE
OK p 5. top bullet on the speed of reductions. Delete sentence that reads: "If emissions reductions...emissions target." It leads to assumption that we do not need to act at all - and that natural turnover rates are alone acceptable without speeding up.

too strong
OK p 6. bottom paragraph on developing countries: Add words "over the long term" after "countries must be part of the process."

ADD:
OK p 7. Top paragraph. Delete last sentence: "In short...global solutions." Replace with: "However it must be recognized that such action cannot be expected yet economic data also show that developing countries have on average only a tenth or less of developed countries per capita income - and a quarter or less of per capita emissions of greenhouse gases. We must find the technologies and solutions to lead the way."

centuries. As the global climate changes, ^{will be} it is difficult to know with ^{certainly, the exact} precision which regions will ^{magnitude, timing, and regional impacts,} get warmer and which will get cooler, which will get wetter and which will get drier, which will get stormier and which will get calmer. This means that the benefits of climate protection are very difficult to quantify. And, while the potential costs of reducing greenhouse gas emissions may be more immediate, they too, as I will discuss below, are difficult to predict with any certainty. Many unanswered questions exist about the biophysical systems, potential thresholds, and economic impacts. In short, if anybody tells you that he or she has the definitive answer as to the costs and benefits of particular climate change policies, I would suggest that you raise your collective eyebrows. ^{OSTP recommends we insert what we do know about the science}

Lessons from the Economic Literature

- temperature increases, 1-3.5°C by 2100
- intensification of hydrologic cycle, floods, droughts
- sea level rise, up to one and half feet by 2100

Let me now turn to the economics literature and try to summarize what I think we know so far about this difficult topic. With a few notable exceptions, economists have generally not addressed the benefits of climate protection, but rather have focused on the costs associated with alternative paths for reducing greenhouse gas emissions. The economics literature includes estimates using many different models to evaluate numerous alternative emission reduction strategies. In fact, because there are so many different models, economists initially faced difficulties in comparing results: they could not sort out the extent to which differences in results stemmed from differences in models and assumptions versus differences in baseline emission paths and policies. To solve this problem, thereby enabling meaningful comparisons, many economists have calibrated the various models by performing a standardized simulation. Specifically, they have assessed the consequences of stabilizing greenhouse gas emissions at 1990 levels by 2010 or 2020.

^{Josh} The Administration's Interagency Analysis Team (IAT) ^{has been} a staff level group working to understand the economic implications of climate change policies. ^{they} took the emissions scenario

Already changed

Changed

X

In short, the greater the substitution possibilities and the faster the economy can adapt, the lower the costs.

How the plan is implemented. Second, costs depend critically on how emission reduction policies are implemented. It boils down to this: if we do it dumb, it could cost a lot, but if we do it smart, it will cost much less and indeed could produce net benefits. The over 2000 signatories of the economists' statement argued that any global climate change policy should be based on market-based mechanisms because such mechanisms allow for flexibility in both the timing and location of emission reductions, thereby minimizing the costs to the U.S. economy. The economists concluded that "there are policy options that would slow climate change without lowering American living standards and these measures may in fact improve productivity in the longer run."

- Look
back
using
EPA
language*
- The speed at which emissions reductions occur has large effects on the estimated costs. *However, waiting won't work. Deferring action will raise the cost of stabilizing the world's atmospheric concentrations. The natural turnover of the capital stock will incorporate newer, energy-efficient of green house gases, our ultimate goal.*
technology, lowering the ultimate economic cost of meeting any specified emissions target. Similarly, longer lead times until emissions constraints are binding permits the development of new technologies and allows a more orderly fuel-switching process, preventing bottlenecks that can drive up the estimated costs.
 - A "cap and trade" system in which emission permits are issued and then traded among firms can substantially reduce the cost of meeting an emissions target by creating incentives for emissions to be reduced by those firms and in those activities where costs are lowest.
- X*

11/20/97
Q

most-often used in the academic literature-- that is, stabilizing emissions at 1990 by 2010--as the starting point for their own analysis. The ~~staff~~^{staff} used three different models and a common baseline, and to the maximum extent possible the same set of assumptions on how the economy works. The results of this modeling exercise fell within the range found in the broader literature on the economic effects of climate protection. These results were sent out to 12 peer reviewers, who raised a range of questions, including the appropriateness of the models and the assumptions used. A ~~draft of the IAT report that summarizes this work~~^{summary of their work to date} was given to the Subcommittee this morning, along with the reviewers comments. I would be happy to answer any questions you may have about the staff modeling effort.

Chungel

The Lessons. Modeling efforts both inside and outside the Administration clearly indicate that economic analysis can do no more than estimate a range of potential impacts from particular policies and highlight how outcomes depend on underlying assumptions about how the economy works and the ways in which policy is implemented. However, the economics literature on climate change does point to several important lessons:

How the economy works. First, the magnitude of the costs of reducing greenhouse gas emissions in the various models depends crucially on a number of key assumptions about how the economy works. For instance:

- If firms in the economy can shift from high-carbon to low-carbon energy sources quickly, the costs of climate protection will be lower.
 - If the economy has significant opportunities, even now, to employ energy-saving technology at low costs, the costs of climate protection will be lower.
 - If technological change occurs at a rapid rate, or is highly responsive to increases in the price of carbon emissions, the costs will be reduced.
 - If the Federal Reserve pursues a monetary policy oriented toward keeping the economy at full employment, transitional output costs will be lower.
- f

~~The timetable for the inclusion of developing countries is also important. The sooner that developing countries face incentives to move away from carbon-intensive energy sources, the less likely it is that they will become dependent on those types of fuels to spur their economic growth.~~ In short global problems require global solutions.

NO
why?

Conclusion

Let me conclude. Policies to promote economic growth, create jobs, and improve the living standards and opportunities of all Americans have been and always will remain the top priority of the President and his Administration. In his remarks to Business Roundtable on global climate change, the President said "[l]et's find a way to preserve the environment, to meet our international responsibilities, to meet our responsibilities to our children, and grow the economy at the same time."

Some of the key economic lessons we have learned that will help us achieve the President's goal include:

- Inherent uncertainty dictates that models should only be expected to generate a range of economic impacts, not definitive answers.
- Key assumptions about how the economy works directly influence the estimated costs of climate protection.
- Implementation of any policy needs to be market-based and maximally flexible over time and space, to achieve the lowest cost reductions.
- All nations, both developed and developing, need to participate.

Thank you. I would be happy to answer any questions you may have.

L

DOE COMMENT ON CEA TESTIMONY

Concerned that present paragraph describing revenue recycling implies too strongly that there is revenue to be recycled. Paragraph also needs to provide two key economic caveats: 1) gross output is not the only economic variable of interest; 2) carbon reduction and other reforms have separable and distinct economic impacts.

Suggested rewrite follows:

In many model simulations, emissions are reduced using market mechanisms. In some scenarios (e.g. auctioning emissions permits), the Federal government realizes an increase in revenues, while in others (e.g. giving out emissions permits to emitters as in the sulfur dioxide emissions allowances program) it does not. If the market mechanism used to reduce emissions generates revenue, that revenue could be used to reduce other distortionary taxes that diminish the incentive to save, invest or work -- so-called "revenue recycling." Alternatively, revenues could be channeled into deficit reduction or debt retirement, which can boost investment by lowering interest rates. In some models and scenarios, the combination of emissions reductions and other reforms generates a net increase in economic output when revenues are recycled in a growth-promoting fashion. These results raise many interesting issues that merit further examination, including impacts on the composition as well as the overall level of output, and identification of the separate effects of carbon reduction and other changes that could also be implemented in its absence.

Page 6, full paragraph

Too much
Not CEA
Todd
Stern
do not
want
this
developed
this
much

+

DAVID Sandalow
Dan Tate
Bill Rothholes
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U.S. House of Representatives
Committee on Commerce
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October 8, 1997

JAMES E. DERDERIAN, CHIEF OF STAFF

The Honorable Janet Yellen
 Chair
 Council of Economic Advisors
 Old Executive Office Building
 Washington, D.C. 20502

The Honorable Timothy E. Wirth
 Under Secretary for Global Affairs
 U.S. Department of State
 2201 C Street, N.W.
 Washington, D.C. 20520

Dear Ms. Yellen and Under Secretary Wirth:

Last week I received your initial responses to a series of questions I sent to the Department on August 22, 1997. On behalf of the Energy and Power Subcommittee, I have attached the questions, and once again, commend them to your attention. Not only is the joint submission I have received from your offices late and incomplete, but most of the responses are wholly inadequate.

In the past weeks, you were apprised by my staff as to the time-sensitive nature of our correspondence. An extension was requested by your staff, which I granted on the promise that the extension would allow for a more complete and responsive submission. I hardly need to emphasize the urgency with which the Congress views preparation for the final negotiating session on the future climate change treaty. As the last negotiating meeting grows nearer, we are justifiably anxious to have whatever benefit can be derived from the Administration's thinking on this issue. Any agreement that the Administration signs could bind the U.S. well into the next century and have a profound impact on U.S. industry, jobs, and lifestyle. Thus, I believe you will understand my disappointment at the responses that were received yesterday.

To highlight all of the specific examples from your letter that I find incomplete, would be counterproductive. I shall only point out two instances where the Administration appears to obfuscate and obscure rather than use the opportunity to clarify its position on climate change which was my intention and the goal of the Subcommittee with respect to these follow-up questions.

The Honorable Janet Yellen
The Honorable Timothy Wirth
October 8, 1997
Page 2

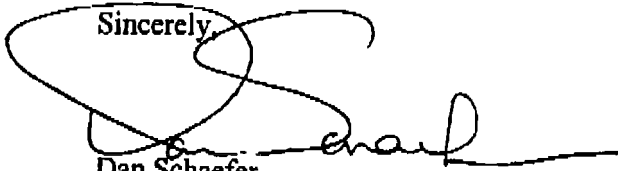
For example, in response to Question 12, addressing whether the Administration still opposed the use of taxes to address climate change. You can understand my frustration, and that of the Subcommittee Members, upon reading a response that essentially said the Administration was still developing its policy. This is disturbing not only because it may indicate a change in Administration position on this issue, but also because we now don't know what the Administration position is on this critical issue less than eight weeks away from the start of the final negotiating meeting.

Similarly, when asked the cost of the Interagency Analytical Team the response was "no effort was made to keep track of costs..." and the Administration "did have some contract costs for modeling." The question asked "what were the costs?" not, "did the Administration keep track of the costs?"

I am hopeful that you will attend to this matter as a priority and that more complete responses will be forthcoming at your earliest convenience. To that end, I ask that your staff meet as soon as possible with Commerce Committee majority and minority staff to specify the questions that need more complete responses. I would like all of your amended responses prior to the start of the next negotiating session in Bonn, Germany which is scheduled for October 20, 1997.

Thank you for your prompt attention to this matter.

Sincerely,



Dan Schaefer

Chairman

Subcommittee on Energy and Power

Attachment

cc: The Honorable Tom Bliley, Chairman
The Honorable John Dingell, Ranking Member
The Honorable Ralph Hall, Ranking Member
Subcommittee on Energy and Power

SUBCOMMITTEE ON ENERGY AND POWER
HEARING ON GLOBAL CLIMATE CHANGE
FOLLOW-UP QUESTIONS

Interagency Analytical Team Report

1. Please identify each member of the Interagency Analytical Team (IAT) from the date of its inception to the present time, any other participants inside or outside the Administration, and specify their responsibilities.
2. When was the IAT formed and what were the IAT's instructions? Please provide any documentation regarding the formation of the IAT and its mission, responsibilities, membership or assignments.
3. Please indicate the total costs of the IAT's efforts and the share paid annually by each Department or Agency that was involved and please identify the source of the funds within each Department or Agency.
4. Is the IAT still in existence? If so, what are its current responsibilities?
5. Please provide a copy of all drafts of the IAT report in addition to the May 16 and 30, 1997 drafts, both earlier and later.
6. Please explain how the peer reviewers were selected? What instructions were those peer reviewers given? Please provide copies of any correspondence or instructions that were sent to the peer reviewers.
7. If the IAT effort is in fact a "failed" project as indicated in Administration testimony at the Subcommittee hearing how will the Administration determine the appropriate level of future international climate change commitments for Kyoto and later?
8. As late as last May when Dr. Ehrlich and others in the Administration held briefings on the then draft analysis and assessment there was no hint that the Administration considered this effort a failure and the models to be unreliable. What occurred since May that caused the Administration to apparently reach a different conclusion from that of Dr. Ehrlich?
9. The IAT draft analysis referred to three scenarios which resulted in costs of future climate commitments of approximately \$200, \$100 or \$50 per ton carbon tax equivalent. Has the Administration concluded that a \$200 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness? Has the Administration concluded that a \$100 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness? Has the Administration concluded that a \$50 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness. Please provide the basis for any of the above conclusions. If the Administration does not support any of the above costs, what analysis or other information does the Administration intend to rely on to support a different amount?

10. Is the paper prepared by the IAT both an analysis and assessment? How does it relate to the "analysis and assessment" referred to in Paragraph 4 of the Berlin Mandate? Has the Ad Hoc Group on the Berlin Mandate provided an analysis and assessment as required by the Berlin Mandate?
11. The IAT draft states that the central policy modeled for the analysis "is aimed at reducing carbon and other greenhouse gas emissions by stabilizing them at 1990 levels" and that policy would be "announced in 2000 and its restrictions are phased in over a ten year period, so that the policy would take full effect in 2010." Reports in the media after the Denver Summit that President Clinton attended also referenced this date of 2010. In light of EIA's projection of emissions 22% above 1990 levels by 2010, is the Administration considering a target and timetable that calls for stabilization at 1990 levels by 2010?
12. The Administration frequently cites the 2000 economists who say they support controlling greenhouse gases. Their statement supports as the mechanism either carbon taxes or emission permits. In the past, the Administration has said it opposes the use of taxes. Is that still the Administration's position?
13. The IAT draft explains that these emission reductions to achieve stabilization would be through "issuing tradable permits at the earliest point of energy production or when imported into the U.S." and that the permits "are initially auctioned in a way that is revenue neutral: i.e., all revenues generated would be recycled through the economy." Would these revenues be deposited in the treasury as miscellaneous receipts under the Economy Acts? Would they then have to be recycled through changes in the tax laws or by appropriation? How would they be recycled?
14. Does the Administration believe that permit auctions are the equivalent of a new tax? If not, please explain.
15. The IAT draft states that "among fuels, demand for coal bears the brunt of greenhouse gas stabilization." What is the impact on the U.S. economy as a whole and on the relevant coal regions of this policy towards coal? What will be the job impact? Is the Administration adopting an anti-coal policy? How is this policy consistent with President's Clinton 1995 reply to Mr. Dingell that the U.S. will not agree to any protocol that harms our economy and jobs or our competitiveness?

Kyoto Agreement

16. How long after December 1997 does the Administration think it will take to obtain Senate advice and consent of any Kyoto agreement, to ratify that agreement, and to enact implementing legislation?
17. Which Agency or Department would be responsible for implementing the provisions of any agreement reached in Kyoto, including provision relating to joint implementation, emissions trading, and advancing Article 4.1?

18. What consideration has been given or plans made regarding passage of legislation necessary to implement any agreement reached in Kyoto?

U.S. Draft Protocol

19. Article 17.4 of the Framework Convention on Climate Change (FCCC) specifies that only "Parties to the Convention may be Parties to a protocol." However, there is no assurance that all or even a majority of the 167 Parties to the FCCC will deposit instruments of ratification, acceptance, approval or accession to any protocol adopted by the Parties by consensus or otherwise in Kyoto. What assurances does the U.S. now have that most, if not all, developing country Parties to the FCCC will become Parties to a Kyoto protocol? Why is it in the U.S. interest to agree, without such assurances, to a protocol that proposes to set legally binding post-2000 targets and timetables for Annex I Parties only and also imposes on the U.S. new and legally binding commitments to advance implementation of Article 4.1. of the FCCC, such as those prescribed in paragraph 1, 2, 3, and 4 of Article 5 of the U.S. draft protocol?
20. In a July 18, 1994 letter to the then House Committee on Energy and Commerce, [the State Department] said:
- We agree that there are substantial commitments beyond 2000 for all parties to the Framework Convention under Article 4. Article 4.1 (applicable to both developed and developing countries) contains commitments that are not limited by any specific timetable.
- a) Is there any evidence to date that the U.S. is not abiding by these Article 4.1 commitments? If there is none, why should the U.S. voluntarily agree to reaffirm, as required by Article 5.1 of the June draft, to what the U.S. already agreed to when it ratified the FCCC in 1992?
- b) Is the U.S. asserting that other Annex I Parties are not abiding by such commitments? If so, please identify those Parties.
21. Paragraph 2 of Article 5 of the U.S. draft Protocol mandates each Party to "strengthen its legal and institutional framework to advance implementation" of Article 4.1 commitments. What "framework" does the Administration have in mind? Does this suggest a new Federal or international agency or program? Would this be done through new legislation? If not, how would it be achieved in the U.S.?
22. Article 5.3 requires that each Party take "measures to facilitate investment in climate-friendly technologies." What "measures" does the Administration contemplate? How would they be implemented in the U.S.? What are their regulatory and budgetary implementations?
23. Article 16 of the draft provides that the Parties "shall adopt, by [2005], binding provisions so that all Parties have quantitative greenhouse gas emissions obligations and so that there

is a mechanism for automatic application of progressive greenhouse gas emissions obligations to Parties, based upon agreed criteria."

- a) Does this mean that there could be a second protocol or another legal instrument by [2005] which is only 7 years after the December meeting in Kyoto?
 - b) Do the words "all Parties" in this Article mean that only the "Parties" to the U.S. draft protocol would be required to "adopt" by 2005 such an instrument? Unless developing country Parties to the FCCC, such as China, India and Brazil, become Parties to the Kyoto instrument (as proposed by the U.S.) prior to [2005], how does this Article address the issue of greenhouse gas emission growth by all non-Annex I Parties?
 - c) Could such a new instrument adopted by [2005] impose new and additional obligations on the U.S. beyond those proposed to be adopted in Kyoto? Why is that possibility a good result for the U.S. economy, trade, and competitiveness?
 - d) What "mechanism for automatic application of progressive greenhouse gas emissions obligations" does the Administration contemplate by this proposal? What are its implications for the U.S., including its sovereignty?
24. Article 16.1 of the Convention provides that "annexes shall be restricted to lists, forms, and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character." The U.S. draft protocol states, that it may not be "appropriate" to adopt the Article 16.1 Convention example. Please explain why. Does the U.S. support annexes that would be substantive and mandatory?
25. Article 9 of the U.S. draft provides that Parties "shall cooperate" in establishing a "long-term goal" regarding concentrations of gases. Article 10 calls for meetings at "regular intervals" to, among other things, "periodically review the adequacy" of the Protocol and Article 8 calls for periodic review of the Protocol and guidelines "in light of evolving scientific knowledge related to climate change." Article 2 already suggests a minimum of two budget periods. Article 16 tells the Parties to adopt "binding provisions" by [2005] for progressive "obligations." Does the State Department contemplate over the next several decades a continuing process of meetings of both the Protocol and Convention Parties annually and a series of IPCC assessments, special reports, and technical papers, leading to a series of protocols or other legal instruments that are likely to have significant economic impacts on the Parties and their people? Why is there a need for such frequent meetings and reviews?
26. The Global Climate Coalition sent a letter to the Department of State on February 14, 1997 raising a number of questions about the January 17, 1997 version of the U.S. draft protocol, particularly in regards to trading. The Administration has not yet responded to those questions. Please respond to them as part of your reply to this inquiry.

EU Bubble

27. The EU proposal made recently in Denver was developed last March as an EU "negotiating position for the ongoing negotiations on the Berlin Mandate" and it includes burden-sharing of a 10% reduction among EU members of the "overall emission reduction objective by the Community as a whole". This appears to be a form of differentiation, a concept the U.S. is not supporting. The existing FCCC bubble applicable to the EU presumably only covers policies and measures and, when adopted, it only covered the 12 Parties that were members of the EU in 1992. Does the U.S. understand that the EU is seeking, by its submissions and discussion with the U.S. delegation, to extend a form of the FCCC bubble to a protocol and another legal instrument that may be adopted in Kyoto, to expand the bubble to cover any target and timetable or financial obligations and not just policies and measures, and to expand the bubble to include all present and future members of the EU, such as countries from Central and Eastern Europe? Why is such an expanded bubble in the economic and competitive interests of the U.S.?
28. What is the potential impact of such an expanded EU bubble on the U.S. proposal for international emissions trading? Would it ensure that the EU would get the benefit of any emissions deficit derived from such Central and Eastern European Members and deprive the U.S., Japan, Australia and Canada of that deficit? Would the U.S. then have to rely primarily on Russia's emissions deficit in order to derive any of the benefits of trading?
29. Article 22.3 of the FCCC requires that regional economic integration organizations must declare the "extent of their competence" with regard to obligations under the FCCC. Does the U.S. believe that the EU has the competence to carry out legally binding targets and timetables and to enforce any differentiated targets for its members if they fail to achieve them?
30. The State Department's September 9, 1996 reply to the Committee stated that the U.S. did not agree to an "EU Bubble in Berlin" and that the U.S. delegation "successfully opposed including language in the Berlin Mandate which might have suggested that any country or group of countries could "bubble" in the post-2000 period." The reply then said:

Clearly, the question of "bubbling" with respect to post-2000 commitments is complex, and one that will be closely scrutinized and carefully considered as negotiations progress. The Administration has consistently and continuously consulted with Congress, as well as with U.S. industry and U.S. NGOs, on all aspects of the negotiations concerning post-2000 commitments and will continue to do so.

The Administration has not yet held meaningful discussions with this Committee on the issue of the EU bubbling to "meet and target and timetables," its implications for the U.S., its merits, or its complexities. Given the fact that negotiations are just approaching a conclusion in Bonn and Kyoto, when do you plan to consult us on this aspect of the negotiations?

31. Since 1992, the composition of the only "regional economic integration organization," namely the EU, has grown from 12 to 15 members and several other countries want to expand it further. Under what circumstances would the U.S. agree to an EU bubble that is or could be expanded?

EU Amendment to Convention

32. The EU has proposed an amendment to the Convention to provide for a vote to adopt all future protocols by three-fourths if all efforts at consensus are exhausted. The proposed amendment would appear to have a retroactive effect for Kyoto.
- a) Under this proposal, is it possible that three-fourths of the FCCC Parties could vote to "adopt" any Protocol that imposed new obligations for Annex I and/or non-Annex I Parties and then decide not to deposit an instrument of ratification, etc.?
 - b) Does the U.S. support such an amendment to the Convention?
 - c) Has the U.S. position changed from its June 19, 1996 response to this Committee in regards to any of these matters? Would the Administration agree to a resolution of one of these matters, namely voting on a protocol, without a resolution of the financial and budget matters for both the Convention and all future protocols?

Emissions Trading

33. Does the Administration intend that any international emission trading program would apply in the same way and to the same extent to public and private entities internationally and in the U.S.? For example, would it apply to local governments and to defense or other agencies of each Party and to the emissions of such entities? What will be the impact on the U.S. Defense Department of an international, or, for the matter, a domestic, emissions trading program?
34. Greenhouse gases not covered by the Montreal Protocol are not pollutants within the meaning of the Clean Air Act and are not subject to the command and control provisions of the Act or other environmental laws. It is our understanding that although the U.S. has cited (in a September 9th reply to this Committee) authority to implement the Climate Change Action Plan with voluntary measures, the U.S. draft protocol, because it may call for mandatory measures, could not be given full effect in the U.S. without the enactment of new legislation by Congress. Do you share that understanding? Is the Administration considering a domestic emission trading legislative program patterned on the 1990 Clean Air Act?

General

35. I understand that the Administration has recently established the White House Climate Change Task Force, a Deputies Group and an Assistant Secretaries group. Please explain the role and purpose of each in regards to the development of the Administration's position and policies for the international negotiations for a protocol or another legal instrument in 1997 and for the development of implementing legislation in the U.S. Please identify the members of each group. Please provide any documents regarding the formation of these groups, their membership, mission, tasks, and/or assignments.
36. Please provide a table of all contracts, cooperative agreements, grants, and interagency agreements and any extensions thereof (hereinafter referred to as "agreements") entered into with any individual, agency, or public or private entity (foreign or domestic) by or through any federal Department or Agency, including the Departments of State, Commerce and Energy, and the Environmental Protection Agency, for the period beginning July 1, 1994 to the present that relates to, or includes, (directly or indirectly) climate change matters or issues of any kind. These should include matters relating to (a) domestic or international emission trading, including economic and other analysis of such trading, the administration and verification of such trading in the U.S. and elsewhere, (b) public outreach, general and specific public education, grass roots, community outreach, workshops, (c) transportation efficiency, alternative fuels, transportation generally, utilities, impact on pollutants like ozone and particulate matter, and (d) any legal analysis of these matters and of the Convention or of any statutes concerning climate change or trading. Each table should identify the date of the agreement, the agreement recipient, the amount of Federal funds, the term, including extensions, a brief description, the product and whether it is publicly available, and the status. Please include with each table the applicable "Statement of Work", including any revision thereof, for each such agreement.

*** DRAFT ***

Statement before the House Commerce Subcommittee on Energy and Power

Dr. Janet Yellen

Chair, Council of Economic Advisers

Tuesday, July 15, 1997

Good afternoon, Mr. Chairman and members of the Subcommittee. I appreciate the opportunity to discuss with you today the economics of global climate change.

Introduction

In his speech to the United Nations General Assembly in June, President Clinton emphasized that the risks posed by global climate change are real and that sensible preventive steps are justified. This assessment accords with the views of the more than 2000 economists, including 8 Nobel laureates, who signed a statement supporting measures to reduce the threat of climate change. The economists endorsed the conclusions from last year's report by the Intergovernmental Panel on Climate Change (IPCC), which said that governments should take steps to reduce the threat of damage from global warming, and went on to argue that market-based policies can significantly reduce greenhouse gas emissions without harming the American economy.

At this time the Administration has not settled on a particular set of policies to reduce greenhouse gas emissions. Instead, the President indicated in his U.N. speech that he intends to engage in a discussion with all interested parties about the problems posed by greenhouse gas accumulations and the costs and benefits of corrective action. To this end, the President will hold a White House conference on climate change later this year, and Members of his Cabinet and other senior Administration officials will meet with Members of Congress, scientific and economic experts, environmentalists, local government officials, and business and labor leaders on a regular basis over the next several months to discuss issues related to climate change. This process is intended to inform the Administration's decision-making process, which will culminate in a U.S. policy position in the international negotiations in Kyoto in December of this year.

An important step in this -- and any -- policy process is determining the impact it will have on the American economy. President Clinton's top priority, since his first days in office, has been revitalizing the U.S. economy, creating jobs and investing in people and technology to enhance long-term growth. And, we have made tremendous progress. The President is not going to jeopardize that progress. Any policy he ultimately endorses on climate change will be informed by his commitment to sustaining a healthy and robust economy.

In my testimony today, I would like to describe some of the principal lessons that emerge from the voluminous literature, much of it relatively recent, on the economic impacts of policies to address global climate change.

Underlying Uncertainties

Before I begin my discussion of the economics literature, I would like first to emphasize the great uncertainties associated with estimating both the costs and benefits of reducing greenhouse gas emissions. To provide some perspective: as you all know, it is difficult to gauge exactly what impact the balanced budget agreement will have on the U.S. economy's growth rate, levels of employment, interest rates and consumption over the next five years. But with global climate change, it is orders of magnitude more difficult to gauge the effects on the economy: we are concerned with not just the next five years and not just the American economy, but, rather, we are dealing with economic and physical processes that operate globally and over decades. Although a great many scientists believe that global climate change is already underway, the more serious potential damages associated with increasing concentrations of greenhouse gases are not predicated to occur for many decades. This means that the benefits of climate protection are very difficult to quantify. And, while the potential costs of reducing greenhouse gas emissions may be more immediate, they too, as I will discuss below, are difficult to predict with any certainty. Many unanswered questions exist about the biophysical systems, potential thresholds, and economic impacts. In short, if anybody tells you that he or she has the definitive answer as to the costs and benefits of particular climate change policies, I would suggest that you raise your collective eyebrows.

Lessons from the Economic Literature

Let me now turn to the economics literature and try to summarize what I think we know so far about this difficult topic. With a few notable exceptions, economists have generally not

This is not some civilization =

Stone lemons function as perfect anti-cancer

the staff modeling effort.

The Lessons. Modeling efforts both inside and outside the Administration clearly indicate that economic analysis can do no more than estimate a range of potential impacts from particular policies and highlight how outcomes depend on underlying assumptions about how the economy works and the ways in which policy is implemented. However, the economics literature on climate change does point to several important lessons:

How the economy works. First, the magnitude of the costs of reducing greenhouse gas emissions in the various models depends crucially on a number of key assumptions about how the economy works. For instance:

- If firms in the economy can shift from high-carbon to low-carbon energy sources quickly, the costs of climate protection will be lower.
- If the economy has significant opportunities, even now, to employ energy-saving technology at low costs, the costs of climate protection will be lower.
- If technological change occurs at a rapid rate, or is highly responsive to increases in the price of carbon emissions, the costs will be reduced.
- If the Federal Reserve pursues a monetary policy oriented toward keeping the economy at full employment, transitional output costs will be lower.

In short, the greater the substitution possibilities and the faster the economy can adapt, the lower the costs.

How the plan is implemented. Second, costs depend critically on how emission reduction policies are implemented. It boils down to this: if we do it dumb, it could cost a lot, but if we do it smart, it will cost much less and indeed could produce net benefits. The over 2000 signatories of the economists' statement argued that any global climate change policy should be based on market-based mechanisms because such mechanisms allow for flexibility in both the timing and location of emission reductions, thereby minimizing the costs to the U.S. economy. The economists concluded that "there are policy options that would slow climate change without lowering American living standards and these measures may in fact improve productivity in the longer run."

- The speed at which emissions reductions occur has large effects on the estimated costs. If emissions reductions are phased in over a longer period of time, the natural turnover of the capital stock will incorporate newer, energy-efficient technology, lowering the ultimate economic cost of meeting any specified emissions target. Similarly, longer lead times until emissions constraints are binding permits the development of new technologies and allows a more orderly fuel-switching process, preventing bottlenecks that can drive up the estimated costs.
- A "cap and trade" system in which emission permits are issued and then traded among firms can substantially reduce the cost of meeting an emissions target by creating incentives for emissions to be reduced by those firms and in those activities where costs are lowest.

- International emission permit trading substantially lowers costs by applying the same cost-minimizing principle globally.
- So-called “banking” and “borrowing” of permits increases flexibility and lowers costs by allowing firms to change the timing of their emission reductions.
- Joint implementation, whereby US firms would receive credit for undertaking emission reductions in countries with low abatement costs, would also lower the domestic burden.

An additional aspect of implementation that profoundly affects the costs of reducing emissions concerns “revenue recycling.” In many model simulations, emissions are reduced by using various market mechanisms. In many scenarios, the Federal government realizes an increase in revenues. Economic growth can receive a long-term boost if these revenues are used to reduce distortionary taxes that diminish the incentive to invest, save or work, or if the revenues are channeled into deficit reduction, thereby lowering interest rates and boosting investment. In fact, in some models and scenarios, emissions reduction generates a net economic benefit when the revenues are recycled in a growth-promoting fashion.

Which countries participate. The third lesson that emerges from a study of the economics of climate protection is that developing, as well as developed, countries must be part of the process. While developed countries are responsible for most of the greenhouse gas currently in the atmosphere, developing countries are starting to catch up.

By 2040, the largest fraction of emissions is estimated to come from developing countries. Thus, any comprehensive plan to deal with this global problem must include a mechanism to bring developing countries into the process.

The timetable for the inclusion of developing countries is also important. The sooner that developing countries face incentives to move away from carbon intensive energy sources, the less likely it is that they will become dependent on those types of fuels to spur their economic growth. In short global problems require global solutions.

Conclusion

Let me conclude. Policies to promote economic growth, create jobs, and improve the living standards and opportunities of all Americans have been and always will remain the top priority of the President and his Administration. In his remarks to Business Roundtable on global climate change, the President said “[l]et’s find a way to preserve the environment, to meet our international responsibilities, to meet our responsibilities to our children, and grow the economy at the same time.”

Some of the key economic lessons we have learned that will help us achieve the President’s goal include:

- Inherent uncertainty dictates that models should only be expected to generate a range of economic impacts, not definitive answers.
- Key assumptions about how the economy works directly influence the estimated costs of

climate protection.

- Implementation of any policy needs to be market-based and maximally flexible over time and space.
- All nations, both developed and developing, need to participate.

Thank you. I would be happy to answer any questions you may have.

- ① POTUS and taxes
- ② POTUS does not want to raise taxes
- ③ Even people on other side have done it, Revenue neutral
- ④ But right thing is to look at all things =
NOT taking anything on or off table

Schaefer Q's & A's

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LINDA STRAKEN 647-3550

Questions for the Record Submitted by Chairman Schaefer to

Under Secretary of State Timothy Wirth

House Committee on Commerce

Energy and Power Subcommittee

July 15, 1997

WTC/CEA COMMENTS

1. Q: Please identify each member of the Interagency Analytical Team (IAT) from the date of its inception to the present time, any other participants inside or outside the Administration, and specify their responsibilities.

A: Attached is former Under Secretary Ehrlich's list of people to call regarding IAT meetings. Members of the IAT had varying levels of participation and responsibility.

2. Q: When was the IAT formed and what were the IAT's instructions? Please provide any documentation regarding the formation of the IAT and its mission, responsibilities, membership or assignments.

A: Previously, Agencies worked independently on climate change economic analysis. Beginning in February 1996, however, the Department of Energy and the Environmental Protection Agency began to work together on global climate change analysis and called it the IAT. Their joint efforts provided the analytical foundation for the Springfield Global Climate Change Workshop in June 1996.

Former Under Secretary Ehrlich joined the Administration's climate change analysis effort shortly after the June 1996 Climate Analysis Workshop. He oversaw the analysis from mid 1996 to May 1997. ~~Under Secretary Ehrlich's instructions were to use the IAT to provide a set of analytic tools that would allow the Administration to better understand the economics of the climate change issue.~~

3. Q: Please indicate the total costs of the IAT's efforts and the share paid annually by each Department or Agency that was involved and please identify the source of the funds within each Department or Agency.

A: Costs for the IAT were primarily for personnel. No effort was made to ~~accumulate~~ costs related to the IAT activities. DOE and EPA, who had primary responsibility for the analysis efforts, did have some contract costs for modeling.

keep track of

Schaefer Q's & A's

2

4. Q: Is the IAT still in existence? If so, what are its current responsibilities?

No IAT economic analysis of global climate change is underway.

5. Q: Please provide a copy of all drafts of the IAT report in addition to the May 16th and 30th, 1997 drafts, both earlier and later.

A: Enclosed with this response are photocopies of the May 12th, May 16th, and May 30th drafts of the IAT paper. The May 12th draft was circulated among members of the IAT and senior members of the Administration involved in climate change policy. The May 16th draft was circulated to the peer reviewers, members of the IAT, and senior members of the Administration involved in climate change policy. The May 30th draft was released to the public on July 15th.

6. Q: Please explain how the peer reviewers were selected? What instructions were those peer reviewers given? Please provide copies of any correspondence or instructions that were sent to the peer reviewers.

A: The peer reviewers were selected based on recommendations from senior IAT members. Former Under Secretary Ehrlich made the final selection after consultation with the IAT and members from the White House Task Force on Climate Change.

Former Under Secretary Ehrlich sent letters and attachments to each of the reviewers as well as personally contacting each of them. The letter dated March 20th is a copy of the initial letter sent to Professor Jorgenson. Identical letters were sent to the other peer reviewers over a period of weeks. Enclosed with this letter ~~was~~ a technology note and information on the IAT models and baseline. The undated letter is a copy of the letter that was sent to all reviewers on May 16th with copies of the May 16th draft of the IAT report. Copies of materials sent to the reviewers are enclosed.

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here

7. Q: If the IAT effort is in fact a "failed" project as indicated in Administration testimony at the Subcommittee hearing how will the Administration determine the appropriate level of future international climate change commitments for Kyoto and later?

A: The IAT effort generated ~~much~~ useful information about how to model constraints on greenhouse gas emissions and their potential economic effects. However, the IAT process was unsuccessful in providing a ~~sufficiently narrow range of estimated economic effects to support~~ the Administration's overall decision-making process. As part of the

Definitive answer on the economic

inform

Schaefer Q's & A's

ongoing Administration decision process, a number of different economic and other analyses are being evaluated as guides to the likely effects of reducing greenhouse gas emissions.

3 on the issue of climate change

the Administration is using a range of analytic tools and

8. Q: As late as last May when Dr. Ehrlich and others in the Administration held briefings on the then draft analysis and assessment there was no hint that the Administration considered this effort a failure and the models to be unreliable. What occurred since May that caused the Administration to apparently reach a different conclusion from that of Dr. Ehrlich?

A: When the Administration provided briefings on the work being done by the IAT, the focus was on determining baselines for emissions levels, economic growth, and other key variables and for explaining the different models that were being used. As the work done by the IAT proceeded, the wide range of economic outcomes called into question the benefits of continued work on these economic models, given the many other competing claims on agency resources.

usefulness

results and the concerns raised by the peer reviewers

9. Q: The IAT draft Analysis referred to three scenarios which resulted in costs of future climate commitments of approximately \$200, \$100, or \$50 per ton carbon tax equivalent. Has the Administration concluded that a \$200 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness? Has the Administration concluded that a \$100 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness? Has the Administration concluded that a \$50 per ton carbon tax equivalent cost will not harm the U.S. economy, jobs, and global competitiveness. Please provide the basis for any of the above conclusions. If the Administration does not support any of the above costs, what analysis or other information does the Administration intend to rely on to support a different amount?

A: The implicit price of carbon for the United States reported by the IAT ranged from \$9 to \$145, depending on the situations models, and the assumptions and models used. Similarly, the impact on the U.S. gross domestic product opened a wide range. The IAT found that the estimates of the costs to the U.S. economy of a carbon emissions reduction policy depended on factors, including targets and timetables, technology assumptions, and the implementation of international emissions permit trading. As Dr. Janet Yellen remarked in her July 15, 1997, testimony to the House Commerce Subcommittee on Power, "It boils down to this: if we do it dumb, it could cost a lot, but if we do it smart, it will cost much less, and indeed could produce net benefits in the long run."

Several

the use of Market based incentives

and revenue recycling.

Schaefer Q's & A's

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10. Q: Is the paper prepared by the IAT both an analysis and an assessment? How does it relate to the "analysis and assess merit" referred to in Paragraph 4 of the Berlin Mandate? Has the Ad Hoc Group on the Berlin Mandate provided an analysis and assessment as required by the Berlin Mandate?

A: The IAT analyzed a ~~wide~~ range of emissions targets and timetables as well as a range of implementation plans (such as international emissions trading ~~and joint implementation~~). The IAT analysis does not have any direct relationship to the cited paragraph from the Berlin Mandate.

11. Q: The IAT draft states that the central policy modeled for the analysis "is aimed at reducing carbon and other greenhouse gas emissions by stabilizing them at 1990 levels" and that policy would be "announced in 2000 and its restrictions are phased in over a ten year period, so that the policy would take full effect in 2010." Reports in the media after the Denver Summit that President Clinton attended also referenced this date of 2010. In light of EIA's projection of emissions 22% above 1990 levels by 2010, is the Administration considering a target and timetable that calls for stabilization at 1990 levels by 2010?

A: The IAT's analysis ^{→ for comparing model results} focused on a standard emissions target widely used in the academic literature. The Administration is in the process of determining its position on targets and timetables. The Administration's negotiating position is still in development.

12. Q: The Administration frequently cites the 2000 economists who say they support controlling greenhouse gases. Their statement supports as the mechanism either carbon taxes or emissions permits. In the past, the Administration has said it opposes the use of taxes. Is that still the Administration's position?

A: The Administration's position on implementation options ^{and} strategies relating to greenhouse gas emissions reductions is still under development. This position will be determined in conjunction with a position on targets and timetables, which is also under development.

13. Q: The IAT draft explains that these emissions reductions to achieve stabilization would be through "issuing tradable permits at the earliest point of energy production or when imported into the U.S." and that the permits "are initially auctioned in a way that is revenue neutral: i.e., all revenues generated would be recycled through the economy." Would these revenues be deposited in the treasury as miscellaneous receipts under the Economy Acts? Would they then

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have to be recycled through changes in the tax laws or by appropriation? How would they be recycled?

A: The IAT considered a range of revenue recycling possibilities at a very abstract level. The IAT did not examine the legal framework under which these abstract options might be implemented in the United States.

14. Q: Does the Administration believe that permit auctions are the equivalent of a new tax? If not, please explain.

A: In general, they are not equivalent. Auctions focus on fixing quantities and leave prices free to fluctuate, while taxes focus on prices and allow quantities to adjust to ~~changed price levels~~. 

15. Q: The IAT draft states that "among fuels, demand for coal bears the brunt of greenhouse gas stabilization." What is the impact on the U.S. economy as a whole and on the relevant coal regions of this policy towards coal? What will be the job impact? Is the Administration adopting an anti-coal policy? How is the policy consistent with President Clinton's 1995 reply to Mr. Dingell that the U.S. will not agree to any protocol that harms our economy and jobs or our competitiveness?

A: The IAT analysis found that the implicit price of carbon would range from \$9 to \$145 per ton depending on the model and assumptions used and the specific scenario analyzed. Economic and job impacts would similarly span a range depending on the factors, such as the rate of technological change, targets and timetables, and international emissions permit trading.  several 

It is important to stress that the IAT analysis is just that – analysis – and not policy, as the question suggests. The IAT examined a wide variety of different analytic scenarios as part of its work, and explicitly was not charged with making policy recommendations.

16. Q: How long after December 1997 does the Administration think it will take to obtain Senate advice and consent of any Kyoto agreement, to ratify that agreement, and to enact implementing legislation?

A: There is little information on which to judge the timeframe for the advice and consent process, or for the enactment of implementing legislation in the climate arena. The U.N. Framework Convention on Climate Change was ratified by the Senate in October 1992, only four months after it was signed by President Bush at the Earth Summit in Rio de Janeiro in June 1992. That Convention required no implementing legislation. However,

other Conventions, such as the Law of the Sea, have yet to be ratified, more than a dozen years after signature.

17. Q: Which agency or department would be responsible for implementing the provisions of any agreement reached in Kyoto, including provisions relating to joint implementation, emissions trading and advancing Article 4.1?

A: It is anticipated that several Departments and agencies would have a role in the implementation of provisions related to joint implementation, emissions trading and Article 4.1, including the Department of State, the Department of Energy, The Department of Justice, the Treasury Department, the Department of Agriculture, the Agency for International Development, the Environmental Protection Agency, and possibly the National Oceanographic and Atmospheric Administration and the National Aeronautics and Space Administration. The precise role of each could only be determined once specific provisions had been decided upon.

18. Q: What consideration has been given or plans made regarding passage of legislation necessary to implement any agreement reached in Kyoto?

A: While some consideration has been given to the activities required under various agreement provisions (particularly those introduced by the United States), the lack of general acceptance of any of these provisions in the international negotiations makes the development of any specific legislative proposals premature. The Administration would intend, as part of its package of material to be sent to the Senate, to include it proposals for legislation that would be required to fully implement any agreement.

19. Q: Article 17.4 of the Framework Convention on Climate Change (FCCC) specifies that only "Parties to the Convention may be Parties to a protocol." However, there is no assurance that all or even a majority of the 167 Parties to the FCCC will deposit instruments of ratification, acceptance, approval or accession to any protocol adopted by the Parties by consensus or otherwise in Kyoto. What assurances does the U.S. now have that most, if not all, developing country parties to the FCCC will become Parties to a Kyoto protocol? Why is it in the U.S. interest to agree, without assurances, to a protocol that proposes to set legally binding post-2000 targets and timetables for Annex I Parties only and also imposes on the U.S. new and legally binding commitments to advance implementation of Article 4.1 of the FCCC, such as those prescribed in paragraph 1, 2, 3, and 4 fo Article 5 of the U.S. draft protocol?

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A: [EGC]

20. Q: In a July 18, 1994, letter to the then House Committee on Energy and Commerce [the State Department] said:

We agree that there are substantial commitments beyond 2000 for all parties to the Framework Convention under Article 4. Article 4.1 (applicable to both developed and developing countries) contains commitments that are not limited by any specific timetable.

- a) Is there any evidence to date that the U.S. is not abiding by these Article 4.1 commitments? If there is none, why should the U.S. voluntarily agree to reaffirm, as required by Article 5.1 of the June draft, to what the U.S. already agreed to when it ratified the FCCC in 1992?
- b) Is the U.S. asserting that other Annex I Parties are not abiding by such commitments? If so, please identify those Parties.

A: [EGC]

21. Q: Paragraph 2 of Article 5 of the U.S. draft Protocol mandates each Party to "strengthen its legal and institutional framework to advance implementation" of Article 4.1 commitments. What "framework" does the Administration have in mind? Does this suggest a new Federal or international agency or program? Would this be done through new legislation? If not, how would it be achieved in the U.S.?

A. The Berlin Mandate calls for the negotiating process to "continue to advance the implementation" of Article 4.1 commitments, which also apply to developing countries. The primary U.S. objective, in proposing paragraph 2 of Article 5, was to encourage developing countries with inadequate legal and institutional frameworks to strengthen such frameworks so as to improve implementation of Article 4.1. However, it was considered that there was no reason why such an obligation could not apply to all Parties, namely that all Parties could reasonably be asked to do something to strengthen their frameworks. Even the United States, with its highly developed legal and institutional system, could, for example, enhance its existing administrative abilities to collect and report on inventories of greenhouse gas emissions. It was not intended that any international institutions or processes would be needed to implement such a provision.

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22. Q: Article 5.3 requires that each Party take "measures to facilitate investment in climate-friendly technologies." What "measures" does the Administration contemplate? How would they be implemented in the U.S.? What are their regulatory and budgetary implementations?

A: [Seidel]

23. Q: Article 16 of the draft provides that the Parties "shall adopt, by [2005], binding provisions so that all Parties have quantitative greenhouse gas emissions obligations and so that there is a mechanism for automatic application of progressive greenhouse gas emissions obligations to Parties, based upon agreed criteria."

- a) Does this mean that there could be a second protocol or another legal instrument by [2005] which is only 7 years after the December meeting in Kyoto?
- b) Do the words "all Parties" in this Article mean that only the "Parties" to the U.S. draft protocol would be required to "adopt" by 2005 such an instrument? Unless developing country Parties to the FCCC, such as China, India, and Brazil, become Parties to the Kyoto Instrument (as proposed by the U.S.) prior to [2005], how does this Article address the issue of greenhouse gas emission growth by all non-Annex I Parties?
- c) Could such a new instrument adopted by [2005] impose new and additional obligations on the U.S. beyond those proposed to be adopted in Kyoto? Why is that possibility a good result for the U.S. economy, trade, and competitiveness?
- d) What "mechanism for automatic application of progressive greenhouse gas emissions obligations" does the Administration contemplate by this proposal? What are its implications for the U.S., including its sovereignty?

A: [EGC]

24. Q: Article 16.1 of the Convention provides that "annexes shall be restricted to lists, forms, and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character." The U.S. draft protocol states, that it may not be "appropriate" to adopt the Article 16.1 Convention example.

Please explain why. Does the U.S. support annexes that would be substantive and mandatory?

A: You correctly note that Article 16.1 of the Convention limits the use of annexes to certain types of material. This is not because there is any inherent reason why annexes should be so restricted. Rather, it is because Article 16 goes on to provide an entry-into-force procedure for annexes (and amendments to annexes) under which an annex (or amendment to an annex) enters into force for a Party unless a Party affirmatively does not accept it. (Other modifications to the Convention must be affirmatively accepted by Parties to be binding on them.)

In the context of the Convention, as well as other treaties, the U.S. insisted that the quid pro quo for such a "tacit" amendment procedure with an "opt-out" provision was that annexes be limited to material of a technical (scientific, etc.) nature. This view is consistent with views expressed by the Senate. The purpose of the U.S. comment with respect to the climate change protocol was to flag that annexes are not automatically entitled to "opt-out" procedures; rather, it depends on their context.

25. Q: Article 9 of the U.S. draft provides that Parties "shall cooperate" in establishing a "long-term goal" regarding concentrations of gases. Article 10 calls for meetings at "regular intervals" to, among other things "periodically review the adequacy" of the Protocol and Article 8 calls for periodic review of the Protocol and guidelines "in light of evolving scientific knowledge related to climate change." Article 2 already suggests a minimum of two budget periods. Article 16 tells the parties to adopt "binding provisions" by [2005] for progressive "obligations." Does the State Department contemplate, over the next several decades a continuing process of meetings of both the protocol and Convention Parties annually and a series of IPCC assessments, special reports and technical papers leading to a series of protocols or other legal instruments that are likely to have significant economic impacts on the Parties and their people? Why is there a need for such frequent meetings and reviews?

A: The U.S. has proposed a periodic review of the agreement to insure that any changes in the science are fully taken into account by the Parties. Such flexibility insures that if new information emerges indicating a reduced need to act, the agreement could be modified; conversely, if additional actions needed to be taken to address the threat of climate change, appropriate action would not be delayed. The U.S. proposal also seeks to insure that Parties would be fully informed regarding the compliance of all other Parties – thus removing a potential problem of one Party gaining a competitive advantage though not fully meeting its obligations, while other complying Parties might be penalized. Finally, the U.S. proposal, while setting specific commitments for developed countries, recognizes the need for all Parties to participate. It therefore calls for the negotiation of a new agreement by [2005] that would require all countries – including developing

countries – to adopt legally binding limits on their emissions. We assume that at each stage of the process, a full assessment of the costs and benefits of action would be taken prior to committing the United States to any new legal obligation.

The U.S. proposal for an agreement does not specify the frequency of IPCC Assessments. These reports (the third of which is anticipated to be released in late 2000 or early 2001), have so far been scheduled on a five year cycle – long enough to allow new scientific information to develop, but frequently enough to provide the policy community with regular updates on the state of knowledge regarding the climate change issue.

26. Q: The Global Climate Coalition sent a letter to the Department of State on February 14, 1997, raising a number of questions about the January 17, 1997, version of the U.S. draft protocol, particularly in regards to trading. The Administration has not yet responded to those questions. Please respond to them as part of your reply to this inquiry.

A: [EGC]

27. Q: The EU proposal made recently in Denver was developed last March as an EU “negotiating position for the ongoing negotiations on the Berlin Mandate” and it includes burden-sharing of a 10% reduction among EU members of the “overall emission reduction objective by the Community as a whole.” This appears to be a form of differentiation, a concept the U.S. is not supporting. The existing FCCC bubble applicable to the EU presumably only covers policies and measures and, when adopted, it only covered the 12 Parties that were members of the EU in 1992. Does the U.S. understand that the EU is seeking, by its submissions and discussion with the U.S. delegation, to extend a form of the FCCC bubble to a protocol and another legal instrument that may be adopted in Kyoto, to expand the bubble to cover any target and timetable or financial obligations and not just policies and measures, and to expand the bubble to include all present and future members of the EU, such as countries from Central and Eastern Europe? Why is such an expanded bubble in the economic and competitive interests of the U.S.?

A: The EU has made clear that it believes the bubble covers not only policies and measures, but also any target and timetable. IT has argued that it may use the bubble not only in meeting the non-binding aim of the Convention, but also in meeting any new obligations established under the protocol or other legal instrument. To date, the EU has not discussed with us whether it also covers financial issues. They have also indicated they have not yet determined how or under what circumstances the bubble would apply to new member states.

The United States believes it is the interest of a stable Europe that the European countries continue to develop economically, and has so far been disinclined to intervene in the domestic affairs of any European nation. However, in the context of any new agreement under the Climate Convention, we have not yet accepted that the European member states should be allowed to "bubble" their obligations, nor would we support their doing so unless we were satisfied that such an agreement would not disadvantage the United States.

28. Q: What is the potential impact of such an expanded EU bubble on the U.S. proposal for international emissions trading? Would it ensure that the EU would get the benefit of any emissions deficit derived from such Central and Eastern European Members and deprive the U.S., Japan, Australia, and Canada of that deficit? Would the U.S. then have to rely primarily on Russia's emissions deficit in order to derive any of the benefits of trading?

A: The impact of an expanded EU on any emissions trading provisions is dependent on the level of the target, and the restrictions placed on a trading regime. If country targets or trading restrictions were set so that they required "real" reductions, no specific benefit would necessarily accrue to the European Union, and any reductions would entail real costs. Neither is it clear that the European Union would necessarily claim all the benefits of an expanded membership – emissions trading should in theory equalize the price of reducing a unit of emissions regardless of whether it is in Europe or Russia or the United States. Most analysis does suggest that if the U.S. is to use emissions trading to substantially offset its domestic emissions, even the entirety of the Eastern European country emissions would not suffice; Russia is the only country large enough to accommodate our current levels.

29. Q: Article 22.3 of the FCCC requires that regional economic integration organizations must declare the "extent of their competence" with regard to obligations under the FCCC. Does the U.S. believe that the EU has the competence to carry out legally binding targets and timetables and to enforce any differentiated targets for its members if they fail to achieve them?

A: It is not yet clear how the EU competence will be applied in its implementation if any new obligations under a new legal instrument. We, along with others (e.g., Australia and Japan) have insisted that the issue of EU competence be made fully transparent and provisions for compliance be made acceptable to all Parties before we would agree to allow the EU to undertake its commitments as a single entity rather than individually through each member state.

30. Q: The State Department's September 9, 1996, reply to the Committee stated that the U.S. did not agree to an "EU Bubble in Berlin" and that the U.S. delegation "successfully opposed including language in the Berlin Mandate which might have suggested that any country or group of countries could "bubble" in the post-2000 period." The reply then said:

Clearly, the question of "bubbling" with respect to post-2000 commitments is complex, and one that will be closely scrutinized and carefully considered as negotiations progress. The Administration has consistently and continuously consulted with Congress, as well as with U.S. industry and U.S. NGOs, on all aspects of the negotiations concerning post-2000 commitments and will continue to do so.

The Administration has not yet held meaningful discussions with this Committee on the issue of the EU bubbling to "meet target and timetables," its implications for the U.S., its merits, or its complexities. Given the fact that the negotiations are just approaching a conclusion in Bonn and Kyoto, when do you plan to consult us on this aspect of the negotiations?

A: [EGC]

31. Q: Since 1992, the composition of the only "regional economic integration organization," namely the EU, has grown from 12 to 15 members and several countries want to expand it further. Under what circumstances would the U.S. agree to an EU bubble that is or could be expanded?

A: The U.S. has made it clear throughout these negotiations that there is no EU entitlement to a so-called "bubble" in the Kyoto agreement. Indeed, how a bubble would operate upon EU expansion is one of the many concerns that we and others (for example, the Japanese) have raised in connection with the EU proposal.

32. Q: The EU has proposed an amendment to the Convention to provide for a vote to adopt all future protocols by three-fourths if all efforts at consensus are exhausted. The proposed amendment would appear to have a retroactive effect for Kyoto.

- a) Under this proposal, is it possible that three-fourths of the FCCC Parties could vote to "adopt" any Protocol that imposed new obligations for Annex I and/or non-Annex I Parties and then decide not to deposit an instrument of ratification, etc.?

- b) Does the U.S. support such an amendment to the Convention?
- c) Has the U.S. changed from its June 19, 1996, response to this Committee in regards to any of these matters? Would the Administration agree to a resolution of one of these matters, namely voting on a protocol, without a resolution of the financial and budget matters for both the Convention and all future protocols?

A: (a) Yes. Under the current Climate Convention, as well as this proposal, Parties could adopt an agreement (pursuant to whatever rule of procedure governs adoption) and then not ratify.

(b) We have substantial concerns about the provisional application aspect of the proposal. In effect, it amends the treaty without waiting for the Parties to ratify the amendment.

(c) [Unsure of response to Committee in July 1996 – must cross-reference.]

33. Q: Does the Administration intend that any international emission trading program would apply in the same way and to the same extent to public and private entities internationally and in the U.S.? For example, would it apply to local governments and to defense or other agencies of each Party and to the emissions of such entities? What will be the impact on the U.S. Defense Department of an international, or, for that matter, a domestic, emissions trading program?

A: [Seidel]

34. Q: Greenhouse gases not covered by the Montreal Protocol are not pollutants within the meaning of the Clean Air Act and are not subjected to the command and control provisions of the Act or other environmental laws. It is our understanding that although the U.S. has cited (in a September 9th reply to this Committee) authority to implement the Climate Change Action Plan with voluntary measures, the U.S. draft protocol, because it may call for mandatory measures, could not be given full effect in the U.S. without the enactment of new legislation by Congress. Do you share that understanding? Is the Administration considering a domestic emission trading legislative program patterned on the 1990 Clean Air Act?

A: [Seidel]

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35. Q: I understand that the Administration has recently established the White House Climate Change Task Force, a Deputies Group and an Assistant Secretaries group. Please explain the role and purpose of each in regards to the development of the Administration's position and policies for the international negotiations for a protocol or another legal instrument in 1997 and for the development of implementing legislation in the U.S. Please identify the members of each group. Please provide any documents regarding the formation of these groups, their membership, mission, tasks, and/or assignments.

A: [Seidel]

36. Q: Please provide a table of all contracts, cooperative agreements, grants, and interagency agreements and any extensions thereof (hereinafter referred to as "agreements") entered into with any individual, agency, or public or private entity (foreign or domestic) by or through any federal Department or Agency, including the Departments of State, Commerce, and Energy, the Environmental Protection Agency, for the period beginning July 1, 1994 to the present that relates to, or includes (directly or indirectly) climate change matters or issues of any kind. These should include matters relating to (a) domestic or international emission trading, including economic and other analysis of such trading, the administration and verification of such trading in the U.S. and elsewhere, (b) public outreach, general and specific public education, grass roots, community outreach, workshops, (c) transportation efficiency, alternative fuels, transportation generally, utilities, impact on pollutants like ozone and particulate matter, and (d) any legal analysis of these matters and of the Convention or of any statutes concerning climate change or trading. Each table should identify the date of the agreement, the agreement recipient, the amount of Federal funds, the term, including extensions, a brief description, the product, and whether it is publicly available, and the status. Please include with each table the applicable "Statement of Work," including any revision thereof, for each agreement.

A: [Interagency]

*** DRAFT ***

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Statement before the House Commerce Subcommittee on Energy and Power

Dr. Janet Yellen

Chair, Council of Economic Advisers

Tuesday, July 15, 1997

Good afternoon, Mr. Chairman and distinguished members of the Committee. I appreciate the opportunity to discuss with you today the economics of global climate change.

Introduction

In his speech to the United Nations General Assembly in June, President Clinton emphasized that the risks posed by global climate change are real and that sensible preventive steps are justified. This assessment accords with the views of the more than 2000 economists, including 8 Nobel laureates, who signed a statement supporting measures to reduce the threat of climate change. The economists endorsed the conclusions from last year's report by the Intergovernmental Panel on Climate Change (IPCC), which said that governments should take steps to reduce the threat of damage from global warming, and went on to argue that market-based policies can significantly reduce greenhouse gas emissions without harming the American economy.

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At this time the Administration has not settled on a particular set of policies to reduce greenhouse gas emissions. Instead, the President indicated in his U.N. speech that he intends to open a dialogue with the American people to discuss the problems posed by greenhouse gas accumulations and ~~in search for~~ policy solutions. To this end, the President will hold a White House conference on climate change later this year, and Members of his Cabinet and other senior Administration officials will meet with scientific and economic experts, environmentalists, local government officials, and business and labor leaders on a regular basis over the next several months to discuss issues related to climate change. This process is intended to inform the Administration's decision-making process, which will culminate in a U.S. policy position in the international negotiations in Kyoto in December of this year.

The President is not going to jeopardize that progress

An important step in this -- and any -- policy process is determining the impact it will have on the American economy. President Clinton's top priority, since his first days in office, has been revitalizing the U.S. economy, creating jobs and investing in people and technology to enhance long-term growth. And, we have made tremendous progress. Ensuring that any global climate change policy will not reverse our hard-fought progress will be a central part of our

policy effort. Any policy the President ^{he} ultimately endorses on climate change will be informed by his

In my testimony today, I would like to describe some of the principal lessons that emerge from the voluminous literature, much of it relatively recent, on the economic impacts of policies to address global climate change.

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Underlying Uncertainties

Before I begin my discussion of the economics literature, I would like first to emphasize the great uncertainties associated with estimating both the costs and benefits of reducing greenhouse gas emissions. To provide some perspective: as you all know, it is difficult to gauge exactly what impact the balanced budget agreement will have on the U.S. economy's growth rate, levels of employment, interest rates and consumption over the next five years. But with global climate change, it is orders of magnitude more difficult to gauge the effects on the economy: we are concerned with not just the next five years and not just the American economy, but, rather, we are dealing with economic and physical processes that operate globally and over decades, ~~if not centuries~~. ^(potential) The potential damages associated with increasing concentrations of greenhouse gases are not predicted to occur for many decades, and it is difficult to know which regions will get warmer and which will get cooler; ~~which will get wetter and which will get drier; which will get stormier and which will get calmer.~~ This means that the benefits of climate protection are very difficult to quantify. And, while the potential costs of reducing greenhouse gas emissions may be more immediate, they too, as I will discuss below, are difficult to predict with any certainty. Many unanswered questions exist about the biophysical systems, potential thresholds, and economic impacts. In short, if anybody tells you that he or she has the definitive answer as to the costs and benefits of particular climate change policies, I would suggest that you raise your collective eyebrows.

A great
Although many scientists
believe that ~~the~~ climate
change is well underway,
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Lessons from the Economic Literature

Let me now turn to the economics literature and try to summarize what I think we know

so far about this difficult topic. With a few notable exceptions, economists have generally not addressed the benefits of climate protection, but rather have focused on the costs associated with alternative paths for reducing greenhouse gas emissions. The economics literature includes estimates using many different models to evaluate numerous alternative emission reduction strategies. In fact, because there are so many different models, economists initially faced difficulties in comparing results: they could not sort out the extent to which differences in results stemmed from differences in models and assumptions versus differences in baseline emission paths and policies. To solve this problem, thereby enabling meaningful comparisons, many economists have calibrated the various models by performing a standardized simulation. Specifically, they have assessed the consequences of stabilizing greenhouse gas emissions at 1990 levels by 2010 or 2020.

To facilitate comparison with the broader literature, the Administration's Interagency Analysis Team (IAT)--a staff level group working to understand the economic implications of climate change policies--took the identical emissions scenario--stabilizing emissions at 1990 by 2010--as the starting point for their own analysis. The staff IAT report summarizing this work was released yesterday [OR will be released by the end of July], [along with the reviewers comments].

Sent to the Committee yesterday.

The Lessons. Modeling efforts both inside and outside the Administration clearly indicate that economic analysis can do no more than estimate a range of potential impacts from particular policies and highlight how outcomes depend on underlying assumptions about how the

economy works and the ways in which policy is implemented. However, the economics literature on climate change does point to several important lessons:

How the economy works. First, the magnitude of the costs of reducing greenhouse gas emissions in the various models depends crucially on a number of key assumptions about how the economy works. For instance:

- If firms in the economy can shift from high-carbon to low-carbon energy sources quickly, the costs of climate protection will be lower.
- If the economy has significant opportunities, even now, to employ energy-saving technology at low costs, the costs of climate protection will be lower.
- If technological change occurs at a rapid rate, or is highly responsive to increases in the price of carbon emissions, the costs will be reduced.
- If the Federal Reserve pursues a monetary policy oriented toward keeping the economy at full employment, transitional output costs will be lower.

In short, the greater the substitution possibilities and the faster the economy can adapt, the lower the costs.

How the plan is implemented. Second, costs depend critically on how emission reduction policies are implemented. It boils down to this: if we do it dumb, it could cost a lot, but if we do it smart, it will cost much less and indeed could produce net benefits.

The over 2000 signatories of the economists' statement argued that any global climate

change policy should be based on market-based mechanisms because such mechanisms allow for flexibility in both the timing and location of emission reductions, thereby minimizing the costs to the U.S. economy. The economists concluded that “there are policy options that would slow climate change without lowering American living standards and these measures may in fact improve productivity in the longer run.”

- The speed at which emissions reductions occur has large effects on the estimated costs. If emissions reductions are phased in over a longer period of time, the natural turnover of the capital stock will incorporate newer, energy-efficient technology, lowering the ultimate economic cost of meeting any specified emissions target. Similarly, longer lead times until emissions constraints are binding permits the development of new technologies and allows a more orderly fuel-switching process, preventing bottlenecks that can drive up the estimated costs.
- A “cap and trade” system in which emission permits are issued and then traded among firms can substantially reduce the cost of meeting an emissions target by creating incentives for emissions to be reduced by those firms and in those activities where costs are lowest.
- International emission permit trading substantially lowers costs by applying the same cost-minimizing principle globally.
- So-called “banking” and “borrowing” of permits increases flexibility and lowers costs by allowing firms to change the timing of their emission reductions.

- Joint implementation, whereby US firms would receive credit for undertaking emission reductions in countries with low abatement costs, would also lower the domestic burden.

An additional aspect of implementation that profoundly affects the costs of reducing emissions concerns “revenue recycling.” In many model simulations, emissions are reduced either by selling permits to emit carbon, or by imposing a carbon tax. In either case, the Federal government realizes an increase in revenues. Economic growth can receive a long-term boost if these revenues are used to reduce distortionary taxes that diminish the incentive to invest, save or work, or if the revenues are channeled into deficit reduction, thereby lowering interest rates and boosting investment. In fact, in some models and scenarios, emissions reduction generates a net economic benefit when the revenues are recycled in a growth-promoting fashion.

Which countries participate. The third lesson that emerges from a study of the economics of climate protection is that developing, as well as developed, countries must be part of the process. While developed countries are responsible for most of the greenhouse gas currently in the atmosphere, developing countries are starting to catch up. By 2040, the largest fraction of emissions is estimated to come from developing countries. Thus, any comprehensive plan to deal with this global problem must include a mechanism to bring developing countries into the process.

The timetable for the inclusion of developing countries is also important. First, the sooner that developing countries face incentives to move away from carbon intensive energy sources, the less likely it is that they will become dependent on those types of fuels to spur their economic growth. Second, if left outside the process, developing countries could serve as a haven for carbon-intensive industries from developed countries. In short global problems require global solutions.

Conclusion

Let me conclude. Policies to promote economic growth, create jobs, and improve the living standards and opportunities of all Americans have been and always will remain the top priority of the President and his Administration. In his remarks to Business Roundtable on global climate change, the President said “[I]et’s find a way to preserve the environment, to meet our international responsibilities, to meet our responsibilities to our children, and grow the economy at the same time.”

Some of the key economic lessons we have learned that will help us achieve the President’s goal include:

- Inherent uncertainty dictates that models should only be expected to generate a range of economic impacts, not definitive answers.
- Key assumptions about how the economy works directly influence the estimated costs of climate protection.
- Implementation of any policy needs to be market-based and maximally flexible over time

and space.

- All nations, both developed and developing, need to participate.

Thank you. I would be happy to answer any questions you may have.

* Please get COMMENTS to Michele
by 11 AM *

*** DRAFT ***

KAM Comments

Statement before the House Commerce Subcommittee on Energy and Power

Dr. Janet Yellen

Chair, Council of Economic Advisers

Tuesday, July 15, 1997

Good afternoon, Mr. Chairman and distinguished members of the Committee. I
appreciate the opportunity to discuss with you today the economics of global climate change.

Introduction

In his speech to the United Nations General Assembly in June, President Clinton emphasized that the risks posed by global climate change are real and that sensible preventive steps are justified. This assessment accords with the views of the more than 2000 economists, including 8 Nobel laureates, who signed a statement supporting measures to reduce the threat of climate change. The economists endorsed the conclusions from last year's report by the Intergovernmental Panel on Climate Change (IPCC), which said that governments should take steps to reduce the threat of damage from global warming, and went on to argue that market-based policies can significantly reduce greenhouse gas emissions without harming the American economy.

At this time the Administration has not settled on a particular set of policies to reduce greenhouse gas emissions. Instead, the President indicated in his U.N. speech that he intends to open a dialogue with the American people to discuss the problems posed by greenhouse gas accumulations and to search for policy solutions. To this end, the President will hold a White House conference on climate change later this year, and Members of his Cabinet and other senior Administration officials will meet with scientific and economic experts, environmentalists, local government officials, and business and labor leaders on a regular basis over the next several months to discuss issues related to climate change. This process is intended to inform the Administration's decision-making process, which will culminate in a U.S. policy position in the international negotiations in Kyoto in December of this year.

An important step in this -- and any -- policy process is determining the impact it will have on the American economy. President Clinton's top priority, since his first days in office, has been revitalizing the U.S. economy, creating jobs and investing in people and technology to enhance long-term growth. And, we have made tremendous progress. Ensuring that any global climate change policy will not reverse our hard-fought progress will be a central part of our policy effort.

In my testimony today, I would like to describe some of the principal lessons that emerge from the voluminous literature, much of it relatively recent, on the economic impacts of policies to address global climate change.

Underlying Uncertainties

Before I begin my discussion of the economics literature, I would like first to emphasize the great uncertainties associated with estimating both the costs and benefits of reducing greenhouse gas emissions. To provide some perspective: as you all know, it is difficult to gauge exactly what impact the balanced budget agreement will have on the U.S. economy's growth rate, levels of employment, interest rates and consumption over the next five years. But with global climate change, it is orders of magnitude more difficult to gauge the effects on the economy: we are concerned with not just the next five years and not just the American economy, but, rather, we are dealing with economic and physical processes that operate globally and over decades, if not centuries. ~~The potential damages associated with increasing concentrations of greenhouse gases are not predicted to occur for many decades, and it is difficult to know which~~ *As the global climate changes, with precision* regions will get warmer and which will get cooler; which will get wetter and which will get drier; which will get stormier and which will get calmer. This means that the benefits of climate protection are very difficult to quantify. And, while the potential costs of reducing greenhouse gas emissions may be more immediate, they too, as I will discuss below, are difficult to predict with any certainty. Many unanswered questions exist about the biophysical systems, potential thresholds, and economic impacts. In short, if anybody tells you that he or she has the definitive answer as to the costs and benefits of particular climate change policies, I would suggest that you raise your collective eyebrows.

Lessons from the Economic Literature

Let me now turn to the economics literature and try to summarize what I think we know

so far about this difficult topic. With a few notable exceptions, economists have generally not addressed the benefits of climate protection, but rather have focused on the costs associated with alternative paths for reducing greenhouse gas emissions. The economics literature includes estimates using many different models to evaluate numerous alternative emission reduction strategies. In fact, because there are so many different models, economists initially faced difficulties in comparing results: they could not sort out the extent to which differences in results stemmed from differences in models and assumptions versus differences in baseline emission paths and policies. To solve this problem, thereby enabling meaningful comparisons, many economists have calibrated the various models by performing a standardized simulation. Specifically, they have assessed the consequences of stabilizing greenhouse gas emissions at 1990 levels by 2010 or 2020.

To facilitate comparison with the broader literature, the Administration's Interagency Analysis Team (IAT)--a staff level group working to understand the economic implications of climate change policies--took the identical emissions scenario--stabilizing emissions at 1990 by 2010--as the starting point for their own analysis. The staff IAT report summarizing this work was released yesterday [OR will be released by the end of July], [along with the reviewers comments].

The Lessons. Modeling efforts both inside and outside the Administration clearly indicate that economic analysis can do no more than estimate a range of potential impacts from particular policies and highlight how outcomes depend on underlying assumptions about how the

economy works and the ways in which policy is implemented. However, the economics literature on climate change does point to several important lessons:

How the economy works. First, the magnitude of the costs of reducing greenhouse gas emissions in the various models depends crucially on a number of key assumptions about how the economy works. For instance:

- If firms in the economy can shift from high-carbon to low-carbon energy sources quickly, the costs of climate protection will be lower.
- If the economy has significant opportunities, even now, to employ energy-saving technology at low costs, the costs of climate protection will be lower.
- If technological change occurs at a rapid rate, or is highly responsive to increases in the price of carbon emissions, the costs will be reduced.
- If the Federal Reserve pursues a monetary policy oriented toward keeping the economy at full employment, transitional output costs will be lower.

In short, the greater the substitution possibilities and the faster the economy can adapt, the lower the costs.

How the plan is implemented. Second, costs depend critically on how emission reduction policies are implemented. It boils down to this: if we do it dumb, it could cost a lot, but if we do it smart, it will cost much less and indeed could produce net benefits.

The over 2000 signatories of the economists' statement argued that any global climate

change policy should be based on market-based mechanisms because such mechanisms allow for flexibility in both the timing and location of emission reductions, thereby minimizing the costs to the U.S. economy. The economists concluded that “there are policy options that would slow climate change without lowering American living standards and these measures may in fact improve productivity in the longer run.”

- The speed at which emissions reductions occur has large effects on the estimated costs. If emissions reductions are phased in over a longer period of time, the natural turnover of the capital stock will incorporate newer, energy-efficient technology, lowering the ultimate economic cost of meeting any specified emissions target. Similarly, longer lead times until emissions constraints are binding permits the development of new technologies and allows a more orderly fuel-switching process, preventing bottlenecks that can drive up the estimated costs.
- A “cap and trade” system in which emission permits are issued and then traded among firms can substantially reduce the cost of meeting an emissions target by creating incentives for emissions to be reduced by those firms and in those activities where costs are lowest.
- International emission permit trading substantially lowers costs by applying the same cost-minimizing principle globally.
- So-called “banking” and “borrowing” of permits increases flexibility and lowers costs by allowing firms to change the timing of their emission reductions.

- Joint implementation, whereby US firms would receive credit for undertaking emission reductions in countries with low abatement costs, would also lower the domestic burden.

An additional aspect of implementation that profoundly affects the costs of reducing emissions concerns "revenue recycling." In many model simulations, emissions are reduced *many scenarios* ~~either by selling permits to emit carbon, or by imposing a carbon tax.~~ *using various market mechanisms* In either case, the Federal government realizes an increase in revenues. Economic growth can receive a long-term boost if these revenues are used to reduce distortionary taxes that diminish the incentive to invest, save or work, or if the revenues are channeled into deficit reduction, thereby lowering interest rates and boosting investment. In fact, in some models and scenarios, emissions reduction generates a net economic benefit when the revenues are recycled in a growth-promoting fashion.

Which countries participate. The third lesson that emerges from a study of the economics of climate protection is that developing, as well as developed, countries must be part of the process. While developed countries are responsible for most of the greenhouse gas currently in the atmosphere, developing countries are starting to catch up. By 2040, the largest fraction of emissions is estimated to come from developing countries. Thus, any comprehensive plan to deal with this global problem must include a mechanism to bring developing countries into the process.

The timetable for the inclusion of developing countries is also important. First, the sooner that developing countries face incentives to move away from carbon intensive energy sources, the less likely it is that they will become dependent on those types of fuels to spur their economic growth. ~~(Second, if left outside the process, developing countries could serve as a haven for carbon-intensive industries from developed countries.~~ In short global problems require global solutions.

Conclusion

Let me conclude. Policies to promote economic growth, create jobs, and improve the living standards and opportunities of all Americans have been and always will remain the top priority of the President and his Administration. In his remarks to Business Roundtable on global climate change, the President said “[l]et’s find a way to preserve the environment, to meet our international responsibilities, to meet our responsibilities to our children, and grow the economy at the same time.”

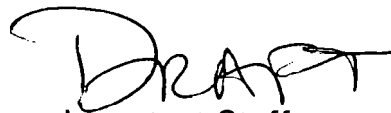
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Statement before the Senate Committee on Important Stuff

Dr. Janet Yellen

Chair, President's Council of Economic Advisers

Tuesday, July 15, 1997

Good morning. I would like to thank the Committee for inviting me here today to discuss the economic aspects of policies to address global climate change. This is an incredibly important issue, with vast implications and a time-scale that policymakers are unaccustomed to dealing with.

I am the Chair of the President's Council of Economic Advisers and I want to make clear that I am not an expert on the subject of climate change. Until the end of May, Dr. Everett Ehrlich, Undersecretary of Commerce served as spokesperson in this area. With Dr. Ehrlich's departure for the private sector, I have stepped in as his replacement. But I am still learning the subtleties of the issue, and, while I am a fast learner, I may not be able to address every aspect of the analysis at this time.

The Science. Accumulations of greenhouse gases in the atmosphere have the potential to disrupt climate on a global scale. While climate scientists cannot predict regional effects with much precision, they can forecast some of the likely global effects if the world's population continues on the current path of greenhouse gas emissions. My understanding of these predictions for the end of the next century is that they include: average temperature increases of 2.0 to 6.5 degrees Fahrenheit, with larger increases likely in the higher latitudes; increased sea levels of perhaps 20 inches, inundating many low-lying coastal areas; greater variability in weather patterns as the hydrological cycle is stressed, leading to more severe droughts and downpours; and the potential for greater spreads of vector-borne diseases, such as malaria.

The International Panel on Climate Change (IPCC), a group of over 1,500 internationally-known scientists, has reported that "the balance of evidence suggests a discernible human influence on global climate." I understand that there may be some dispute among scientists about the ability to detect climate effects of greenhouse gas accumulations over the last 20 or 30 years. However, there is

virtually no disputing the projections that rapidly increasing greenhouse gas concentrations in our atmosphere will lead to undesirable climatic effects on a global scale.

Since the possible negative effects of greenhouse gas accumulations on the global climate are huge and since the science indicates a strong likelihood of experiencing these effects if these accumulations are allowed to increase substantially, it seems prudent for policymakers to consider ways of reducing greenhouse gas emissions as a form of "insurance policy" against these adverse consequences. Science and prudence indicate that we should take out such an insurance policy. The only remaining question is how large that policy should be.

Current Administration Stance. In his speech to the United Nations General Assembly in late June, President Clinton announced his intention to open up a dialogue with the American public to discuss the seriousness of the problems posed by greenhouse gas accumulations and to cooperate in a search for policy solutions. As part of this dialogue, the President announced a White House conference on climate change to be held later this year. Also, a major part of the dialogue will involve Cabinet Members and senior Administration officials speaking with the public, elected officials, and business and labor leaders on a regular basis. The entire process is intended to inform the Administration's decision-making process.

As you know, the Administration is engaged in a set of international negotiations meant to address the issue of climate change. This round of negotiations grew out of a realization that the previous treaty signed in Rio de Janeiro in 1992, and based on voluntary measures to reduce greenhouse gas emissions, was not sufficient to address the problem. The hope for this round of negotiations is that it will lead to an international agreement on an effective treaty that can be signed in Kyoto in December.

The Administration has set forth a series of proposals for the negotiations, including:

- (1) legally binding targets and timetables for reducing emissions in the medium term (generally thought of as 2005 to 2020);
- (2) maximum domestic flexibility for individual countries in meeting treaty

obligations by using the means most appropriate to their circumstances;

(3) maximum international flexibility by establishing an international emissions trading regime among nations with established targets and a joint implementation regime among nations with established targets and those without; and

(4) developing countries' participation in the treaty, with their participation increasing over time.

These proposals recognize the importance of relying on flexible and market-based mechanisms to reduce the overall worldwide cost of meeting any given emissions target. They also recognize that, in the long-term, all nations of the world must participate in order for the agreement to be effective in limiting greenhouse gas concentrations. So far, however, the United States has not articulated a settled on a specific target and timetable for emissions reduction, despite many calls from those in the international community for this particular item. The Administration intends to develop a position on a target and timetable over the next few months, in conjunction with the ongoing dialogue with the American public.

At this point, the Administration has not settled on a particular set of policies to address the issue of climate change. But some things are clear. The President believes that the issue is important and that some steps need to be taken to reduce emissions. This is certain to disappoint those on the right who believe that no changes to current policies are warranted. The President also does not believe that the U.S. should harm its economy to meet arbitrarily chosen targets for emissions reductions. After all, President Clinton has made it a top priority to ensure that the economy continues on track and creates the jobs necessary to maintain and increase the standard of living for all Americans. This is certain to disappoint those on the left who believe that the United States should rapidly and substantially reduce greenhouse gas emissions. The President will listen to the American public, experts, and elected officials, and then make an informed judgment about the policies that are best for America.

The task of getting greenhouse gas emissions under control is not going to be solved in this round of negotiations. The Administration realizes that the current round of talks is just one step in a process that will span decades. Accordingly, the

most important objective is to create a flexible and durable framework for emissions reductions that can accommodate unfolding events for years to come. Such a framework would permit targets and timetables to be adjusted as we learn more about the science and the efficacy of various policies. The framework should also accommodate new participants (e.g., developing countries) on a reasonable schedule that is acceptable to all parties.

The Economic Literature. There is a voluminous literature on the economic effects of climate change policies. Much of this literature has been generated in the past decade, with the newer work generally building on the earlier research. One particular area of extensive research activity involves modeling the economic effects of specific emissions constraints. There are probably a couple dozen of these models referenced in the academic literature and literally hundreds of cost estimates. The results of sixteen of these models (and over 160 cost estimates) are summarized in a recent paper by Robert Repetto and Duncan Austin of the World Resources Institute. What I want to do today is provide a brief overview of this literature to provide a context for the work done by the Administration's Interagency Analytic Team (IAT), a collection of the best economic and energy modelers working for the Federal government.

Economic models are simply collections of assumptions and posited relationships that are used to sharpen our insight into difficult issues. Many of these models base their projections of future relationships between key economic variables (energy use is a key variable in modeling the effects of climate change policies) on econometric estimates using 2 or 3 decades of data, or the modeler's judgment. One of the main values of economic models is the imposition of consistency on complex inter-relationships between variables that may not be immediately apparent in simpler analysis. For example, economic models can make sure that price increases in one market are accompanied by behavioral changes in other, related, markets. And, economic models can help make sure that simple definitional relationships, such as the composition of GDP, are respected in the model output.

Two main types of economic models are used to evaluate the effects of climate change policies on the economy: macroeconomic models and computable

general equilibrium models. Macroeconomic models have grown out of a desire to forecast and understand the response of the economy to the business cycle. The focus of these models is on the adjustment the economy makes in response to a stimulus or "shock". These models allow for temporary and persistent unemployment and accommodate markets that do not clear due to an imperfect matching of supply and demand. Often, these models permit a "vintaging" of capital stock, whereby machinery and equipment retain the efficiency characteristics they possessed when placed in service (some models permit performance of capital to deteriorate over time as the capital depreciates). Some of the more complex macroeconomic models provide detailed representations of various industries, regions, and household types, allowing a rather detailed look at the specific parties affected by a policy change. Modern versions of these models incorporate many relatively sophisticated relationships between labor, capital, energy, and other factors of production and posit fairly wide ranges of behavioral reactions in response to economic changes introduced into the model. The main value of macroeconomic models is the portrayal of how the economy adjusts when a new policy is introduced. These models are likely most effective when used as part of a short or medium term forecast; longer term projections may not be as reliable as those made for shorter periods.

Computable general equilibrium models are intended to capture the long-run economic responses to policy changes and generally do not consider the transition costs to the new state of the economy as very important. These models represent the economy as a set of perfectly inter-related markets, where prices and quantities adjust to ensure that supply equals demand in each market in each period. This ideal economic portrayal of the world ensures that there is no involuntary unemployment and that all factors of production (e.g., labor and capital) are paid in accordance with their productivity. The main value of computable general equilibrium models is their focus on the long run, and the ability to let researchers know about the likely lingering effects of the policy changes under consideration. Because these models are computationally very intensive, they often have very sketchy portrayals of individual industries (sometimes they model only a single composite consumption good) and household types, and generally provide no detail on regional effects.

Useful summary statistics for how climate change policies affect the economy are the effect on GDP and the effect on energy prices. GDP measures the total output of goods and services in the economy in any one year and often is used as a measure of economic well-being, even though GDP does not measure non-market values (such as changes in environmental quality of life) nor tell us anything about distributional concerns. As such, GDP should be regarded as a crude indicator of the effect of the specific policy on the overall economy. Often, economists favor market-based policies to implement any constraints on greenhouse gas emissions. Such policies generally show up as changes in prices for fossil fuels, the largest source of greenhouse gas emissions. Changes in energy prices can give us some notion about the impact a policy may have on individuals' well-being and their economic behavior. Other indicators that can be used to demonstrate the effect of policies on the overall economy include: consumption, unemployment, trade balances, and personal income. These indicators often are not presented in the output of all the economic models used, but they can be helpful in elaborating on the GDP results which are presented.

Table 1 presents estimates for GDP changes associated with various emissions reduction targets. [try to create a table with 1990 emissions levels for 2010 and 2020 and for 90 percent of 1990 emissions levels for 2010 and 2020 -- or whatever is available and similar]

These results show that there is a wide range of estimated GDP effects, with some studies predicting large losses in economic output and other predicting either small losses or even small gains. Two points are important to keep in mind when considering these results. First, the range of possible error associated with any one of these estimates is large. As mentioned earlier, these models are complicated systems of equations, each based on econometric estimates or modeler judgment. Each of these equations, therefore, has embedded in it some amount of possible error, since the equation will never exactly forecast the outcome the future will bring. Combining many of these equations increases the potential for significant forecast errors, especially when projections are made for decades into the future. Second, each economic model incorporates some of the biases and interests of the modeler. For instance, a modeler who believes that capital can quickly shift from one use to another will bring that feature into the model, and the results will reflect the low costs of moving capital around in the economy. A modeler who believes

that capital remains fixed in place until it is retired will make a different set of assumptions that will lead to higher costs of redeploying capital in other uses.

Another key element that goes into the models, but is sometimes overlooked, is the baseline forecast for the economy in the absence of policy changes. These baseline forecasts must incorporate the changing size and composition of the economy, as well as forecasting energy prices and corresponding energy use and emissions. Models from only a few years ago generally had fairly steeply rising energy prices over the forecast period. These energy price forecasts implied that future growth in energy use would be muted, making it less difficult to reach any specific greenhouse gas reduction target. Similarly, forecasts for future economic growth have profound implications for the ease of meeting specific emission targets, because historically energy use has been positively correlated with economic output.

Several observers of the economic modeling activity in the climate change area have noted a small number of key items that really drive the results of this modeling. These include:

- Type of model used (engineering vs. economic, macroeconomic, computable general equilibrium);
- Ease of substitution between factors of production;
- Rate of technology change and energy efficiency improvement;
- Existence and type of "backstop" technology;
- Whether an international emissions trading regime exists;
- How fast emissions are reduced;
- Whether changes to the tax system are made; and
- Whether environmental benefits are counted in the analysis.

Let me briefly discuss each of these.

Type of Model. A key distinction should be noted right away between modeling done by economists and that done by engineers, the so-called "bottom's up" approach. In "bottom's up" modeling, the focus is on the types of technology that are available (or that could be made available). These models usually posit that there are many opportunities to increase energy efficiency or to decrease

greenhouse gas emissions at zero or low cost. The "bottom's up" modelers assume, that with the right policy push, these technologies would be adopted. Once in place, these greenhouse gas friendly technologies would form the base for meeting the specified emissions reduction target, lowering the overall cost of doing so.

Economists generally take a different, and more conservative, approach. They note that companies cannot be expected to long overlook profitable energy-efficiency opportunities and that there must be barriers to adoption not incorporated in the "bottom's up" analysis if valuable technologies remain unexploited. Economic analysis generally examines the effects of emissions constraints on the overall economy, looking at such variables as changes in GDP, consumption, investment, aggregate employment, interest rates, and energy prices. As noted above, two types of models are used in this analysis -- macroeconomic and computable general equilibrium (CGE) models. In general, the results from macroeconomic models indicate greater economic costs for a given emissions constraint than do CGE models.

Ease of Substitution. Models differ in the amount of rigidity assumed in the economy. Some models assume that it is relatively easy to shift capital and labor between industries, to change consumer behavior, and to switch from one fuel to another. These models tend to show lower economic costs from implementing greenhouse gas emissions constraints than do models that assume these changes are more difficult and occur more slowly.

Rate of Technological Change and Diffusion. Assumptions about the rate of technological change and diffusion are among the most contentious in the climate change modeling arena. Economists do not have a compelling explanation of how technological change occurs. Therefore the models generally make ad hoc assumptions about, for example, the pace of energy efficiency improvements adopted in response to the imposition of greenhouse gas constraints. As you might imagine, the more optimistic the assumptions about technological change, the lower the economic cost of meeting a specified emissions target.

Backstop Technologies. Most models assume that some sort of

non-fossil-fuel-based technology will be available in the future to cap potential energy price increases. These technologies could include solar power, nuclear power, biomass, and fuel cells, and the modeler generally specifies a fixed price at which this backstop technology is available in the future. Again, more optimistic assumptions about the existence of a backstop technology lower the estimated economic cost of meeting a specified emissions target.

International Emissions Trading. The existence of a regime where emissions permits can be traded among countries would allow emissions reductions to occur in the cheapest location. Since greenhouse gases are a global concern, reductions in any country are equally valuable. Therefore, if some countries have relatively cheap emissions abatement opportunities available, worldwide costs would be minimized if these countries can arrange to trade emissions permits with countries that have higher abatement costs. Models that incorporate international emissions trading have to specify the costs of emissions reduction opportunities in all the countries involved in the trading, adding to the model's complexity. However, those models that do incorporate international emissions trading find that the costs of meeting specified emissions targets are lower than in those models that examine the U.S. economy in isolation.

Time Path. The speed at which emissions reductions are specified to occur can have large effects on the estimated costs. In general, faster reductions impose greater costs because there is a lot of inertia in the economy and rapid change is costly. If emissions reductions occur over a longer period of time, many models assume that the natural turnover of the capital stock will incorporate newer, energy-efficient technology, lowering the ultimate economic costs of meeting the specified emissions target. Similarly, longer lead times until the emissions constraints are binding would permit a more orderly fuel-switching process, preventing bottlenecks that can drive up the estimated costs in the models.

Changes to the Tax System. Many models examine emissions reduction policies that are specified as either taxes or as domestic emissions trading. In both instances, there are potentially large amounts of revenues generated for the Federal government (for instance, if emissions permits are auctioned to fuel producers and importers). In principle, these revenues could be used to reduce the Federal budget

deficit (or retire debt if a budget surplus is achieved) or to reduce taxes elsewhere in the economy. In practice, many models assume that climate change policies are enacted on a "revenue neutral" basis, so that any revenues raised are returned to the private sector, or "recycled". This is often assumed to be done through reducing payroll taxes, individual income taxes, corporate income taxes, or even creating an investment tax credit. In many models, GDP growth is fairly sensitive to certain tax parameters; in some models, an investment tax credit can lead to a rapidly expanding capital stock and greater overall output. In some models, then, changing the balance of revenues in the overall tax system can substantially reduce the estimated costs of meeting an emissions target. Of course, the models would operate the same way (generating an expanding GDP, for example) if the shift in tax burdens was done by itself, and not as part of an emissions reduction strategy.

Counting Environmental Benefits. In many economic models, GDP is viewed as the main measure of economic well-being. But policies to reduce greenhouse gas emissions can have other, non-GDP benefits, such as reducing the risk of disruptive weather patterns and reducing conventional pollution and congestion. Placing a value on these benefits and incorporating them into the analysis reduces the net cost of meeting a specified emissions target.

These key assumptions explain a large portion of the variation in cost estimates of emissions reduction policies. By combining the most pessimistic sets of assumptions -- a macroeconomic model with little substitution among factors of production, slow diffusion of new technology with an expensive backstop technology, no international trading, a rapid reduction in emissions in the short term, returning any revenues to households in the form of a flat per capita payment, and ignoring environmental benefits -- can easily lead to a 3 percent reduction in GDP in the model (for, say, a 25-30 percent reduction in emissions).

But, if the most optimistic set of assumptions is used -- CGE model with flexible factor substitution, rapid deployment of new and inexpensive energy-efficiency technology, full-blown international trading and joint implementation, a modest reduction of emissions over decades, a pro-investment "recycling" of any revenue raised, and large environmental benefits incorporated into the analysis -- the costs of implementing the emissions constraint would be

estimated as very small (or perhaps the estimate might show a net benefit to the economy).

The main point here is that the modeling results are very much dependent on the sorts of assumptions built into the models used, as well as the policies being modeled. The range of results in the literature is large and so results from any one model should not be viewed as definitive.

The Interagency Analytic Team. The various agencies interested in climate change policies contributed some of their best analysts to an Interagency Analytic Team (IAT). This group selected three models in an effort to evaluate the effects of emissions reduction policies. These models included one macroeconomic model, one general equilibrium model, and one model that possessed a large amount of detail on available technology choices. After months of establishing a baseline, calibrating the models, and putting them through a rigorous set of checks for internal consistency, some results were produced. Not surprisingly, the IAT results for a set of policies modeled elsewhere in the literature were right in the middle of the range of published results. I say "not surprisingly" because the assumptions made by the IAT modelers tended to be in the middle of the ranges used by modelers in this area.

One thing we took away from the IAT process was a sense that it is futile to expect a definitive answer to the question of "what are the economic effects of a specific emissions reduction policy?". The best the IAT could do was come up with a rather wide range of effects, depending on a host of assumptions. Moreover, the IAT found that it is difficult, if not impossible, to model specific detailed policies because the models are constructed at a very high level of generality.

The IAT modeling was not a full-blown cost-benefit analysis, but rather an exercise that focused on the economic costs of implementing the specified policies. Little effort was made to quantify the benefits of reducing greenhouse gas emissions and eventually limiting greenhouse gas concentrations in the atmosphere. These benefits are real, but are very difficult to quantify, because they manifest themselves only in the distant future and because they are dependent on worldwide cooperation in meeting the specified targets.

I understand that a staff draft of an IAT report was leaked a few weeks ago. This particular draft had a number of shortcomings, some of which have been addressed in the last few weeks, as part of the peer review process. A revised version of this paper will be released by the end of July, as soon as some final minor edits are made. I want to emphasize, however, that this report is a staff-level draft that examines several possible emissions reduction targets, centered on ones most often seen in the academic literature. It is not an official Administration document, nor is it intended to indicate preferred Administration policies.

(If the IAT report is released Monday, use the following bracketed material instead)

[The IAT released a staff draft report on its modeling activities on Monday. This report examines several possible emissions reduction targets, centered on ones most often seen in the academic literature. This is not an official Administration report, nor is it intended to indicate preferred policy choices. Rather, the report gives the state of the IAT modeling at the beginning of June. Since that time, we have become convinced that further refinement of the models for purposes of obtaining "better" estimates is not desirable.]

Lessons Learned. Despite being unable to calculate precisely the economic effects of choosing particular emissions targets, the IAT modeling exercise did yield a few important lessons for developing policy. These include:

1. The macroeconomic costs of imposing constraints on emissions are significant, but do not derail the economy. This recognizes that the U.S. economy is robust and dynamic and eventually can adapt to the shock imposed by binding emissions constraints.
2. Higher domestic energy prices can have substantial effects on certain sectors of the economy, even if the aggregate economy performs well. Generally, fuel producers and energy-intensive industries have the most difficult adjustments to make.

3. In almost all model runs, coal bears the brunt of the emissions constraints. This is because coal is the most carbon-intensive fuel and because fuel switching (e.g., substituting natural gas for coal in electricity generation) is a fairly low-cost and feasible alternative.

4. The existence of a well-functioning international emissions trading market can cut the economic cost of U.S. compliance with emissions constraints substantially (perhaps as much as in half). Such a market allows high cost abaters (e.g., the U.S.) to trade with lower cost abaters (e.g., Russia), reducing worldwide compliance costs.

5. In the very long run (say over 100 years) technology must be developed to allow economies to function in less greenhouse gas intensive ways. Faster technological progress can reduce the economic costs of meeting a specified constraint substantially, especially after 20 years or so.

6. Promoting additional investment is a key way to reduce overall economic costs, because newer investment likely will embody the latest in energy-efficient technology.

7. Phasing in emissions constraints generally reduces the economic costs by spreading out the shock of higher energy prices. The economy can better adjust to the imposition of emissions constraints if a credible price path is apparent early on (this allows firms to make better choices for long-lived investments).

8. The effects on U.S. industries due to trade flows need not be large. If the OECD adopts tight emissions controls and developing countries do not, some fear that U.S. industries will be placed at an incredible disadvantage. However, this ignores the fact that U.S. companies already face incredible differences in energy prices, wages, taxes, productivity, and so on, without suffering much from worldwide competition. Very preliminary analysis suggests that moderate increases in energy prices should not be expected to have huge across-the-board effects, though some industries could certainly be affected.

If I only leave you with one thing today, I would like it to be the following:

Models are only as good as the assumptions that they are built upon. Models of climate change are more complicated than most, and the results generated span a very wide range. At this point, economic models can give us some lessons in how to think about emissions reduction policies, but it is fruitless to think that these models will be able to precisely tell us how the U.S. economy would react to emissions constraints over the next few decades.

This concludes my prepared testimony. I would be happy to answer any questions that you may have.

Q. The Administration is planning to implement a climate change agreement which would require developed countries to reduce emissions, but not require developing countries to do so. Won't this agreement negatively affect the international competitiveness of U.S. industry?

A. Work that the U.S. government has commissioned by DRI, a private consulting firm, suggests that the international competitiveness implications for U.S. economy will be slight. DRI estimates that only 1% of all U.S. industrial sector energy use (and emissions) will shift overseas as a result of the agreement. The degree to which particular industry is vulnerable to overseas competition will depend upon (1) its energy intensiveness (2) the degree to which it is in direct competition with imports from countries not likely to be subject to our binding targets for emissions and (3) whether the particular U.S. industry exports to countries not subject to the agreement.

For most industries, either (a) energy is not a large fraction of their costs, or (b) the industries do not have direct competitive pressure on their products. However, there may be particular industries that will be more adversely affected.

ARGONNE REPORT Q'S AND A'S

Q1. WHAT WAS THE PURPOSE OF THIS STUDY?

A1. The purpose of this study was to explore the possible effects of a set of hypothetical fuel price increases on six energy-intensive industries that are subject to significant foreign competition:

- basic chemicals;
- iron and steel;
- petroleum refining;
- paper and allied products;
- aluminum; and
- cement.

Panels of industry representatives and experts from academia, environmental groups, organized labor, the financial community, and government were asked to assume a projection of energy price increases that incorporated specific assumptions about the energy price effects of a postulated climate change agreement, and reflect on the possible industry responses. Panels for each of the industries met to discuss the possible impacts on industry output, employment, energy usage, technology, costs, prices, imports, and exports.

Q2. WHAT DID THE PANELISTS FIND?

A2. Overall, the participants reported negative impacts on the six industries under the assumed energy price increases. Panelists predicted that the industries would experience reductions in output and employment from the projected baseline levels.

Less-developed countries, which were assumed in the workshops not to adopt binding commitments to lower greenhouse gas emissions in the timeframe considered, would capture an increasing share of the respective markets. Some industries would locate new plants in the less developed countries, and some would increase the utilization of existing production facilities already located in these areas.

Q3. WHAT IS THE DEPARTMENT'S RESPONSE TO THIS INPUT FROM INDUSTRIAL EXPERTS?

A3. The workshops provided valuable information that reinforced the need to pursue sensible climate change policies. The negative conclusions expressed by the participants and summarized in this report are predicated on the specific energy price scenarios assumed in mid-1996, which do not reflect key policies advocated in international negotiations by the Clinton administration in the intervening year. For example, the assumed fuel price

scenarios do not take into account the impact of multi-year emissions budgets, international emission trading, and joint implementation. If adopted, these provisions would lower the costs of achieving emission reductions in the U.S. and other developed countries and would significantly lower the energy price increases assumed in the workshop scenarios. The Administration has also argued that the developing countries should assume additional obligations in the near future to reduce the projected rapid growth of greenhouse gas emissions. No such actions were reflected in the workshop scenarios.

The environmental and socio-economic issues surrounding the stabilization of greenhouse gas emissions have been the subject of considerable debate, but are especially sensitive now as participating nations are engaged in a new round of negotiations for further commitments within the Framework Convention on Climate Change that will conclude in December of 1997 in Kyoto, Japan. The U.S. position taken in these negotiations stresses that international agreements to combat the threat of climate change must be flexible, cost-effective, realistic, achievable, and ultimately global in scope.

By examining scenarios that do not reflect such policies, the workshops identified important economic risks in key industrial sectors that reaffirm the wisdom of the U.S. approach.

Q4. HOW DOES THIS VERSION OF THE REPORT COMPARE TO THE EARLIER (DRAFT) PAPER BY SUTHERLAND?

A4. A draft paper providing a personal interpretation of the workshops was circulated prior to completion of this report by an individual employee of Argonne National Laboratory. That paper was apparently prepared in advance of the participants' review of the workshop summaries and prior to the lead authors' completion of the revised focus papers based on comments received at the workshops. The Argonne report issued this week provides an accurate and complete summary of the workshop findings.

Q5. DOESN'T THIS REPORT UNDERCUT THE ADMINISTRATION'S POSITION ON CLIMATE CHANGE?

A5. No. Rather, it highlights the need for flexibility in implementing emissions reduction and the need to engage developing countries in the process of emissions reduction. Flexibility, including emissions trading, joint implementation, and multi-year emissions budgets and provisions to ensure the future participation of developing countries in binding emissions reductions are central elements of the Administration's climate change strategy.

Q6. HOW DOES THIS STUDY RELATE TO DOE'S INITIATIVES TO INCREASE INDUSTRIAL ENERGY EFFICIENCY?

A6. The study is unrelated to the activities of the Department's Office of Industrial Technologies, which is actively cooperating with many of these industries to achieve dramatically improved energy efficiency. Success of these efforts has the potential to improve the competitiveness of U.S. producers while reducing their energy use and greenhouse gas emissions. Increased energy efficiency also makes U.S. producers less sensitive to the adverse effects of any future energy price increases, regardless of their source.

Q7. WHAT WAS THE BASIS FOR THE PRICE SCENARIOS ASSUMED, AND HOW DO THEY COMPARE TO THE PRICE SCENARIOS BEING USED FOR THE INTERAGENCY ANALYSIS TEAM WORK?

A7. The hypothetical fuel price scenarios used in this project are within the range suggested by analyses presented at the inter-agency Climate Change Analysis Workshop held at Springfield, Virginia in June, 1996. These analyses were preliminary in nature and did not incorporate cost-saving features currently included in the U.S. negotiating position such as emissions trading, joint implementation, and multi-year emission budgets. The industry workshop participants did not assume any complementary technology-oriented policy measures, nor were they asked to consider price scenarios which included ameliorative policy measures that could offset the impact of energy price increases on industry.

Q8. WHAT IS THE BASELINE STATUS OF THESE INDUSTRIES IN THE ABSENCE OF CLIMATE POLICY?

A8. In many of these industries, recent U.S. investment has been in the form of refurbishing existing plants rather than building new "greenfield" plants. Even without the assumed fuel price increases, countries with lower costs for energy and other inputs or more rapidly growing demands may be more attractive than the U.S. as sites for new greenfield plants.

Q9. HOW IMPORTANT ARE DEVELOPING COUNTRY COMMITMENTS TO THE LONG RUN RESULTS?

A9. The Administration has argued that developing countries should assume additional obligations in the near future to reduce growth in their GHG emissions. While developed countries now account for the lion's share of emissions, developing country emissions are projected to grow rapidly. The potential for shifting production of energy-intensive products to developing countries identified in the Argonne report would exacerbate emissions growth. It will not be possible to achieve the long run objective of the Climate Convention without substantial

emissions reductions by developing countries. Their commitment to such reductions, which were not reflected in the workshop scenarios, would be likely to significantly reduce the potential for shifts in industry location identified at the workshops.

It is likely that energy-intensive industries in other developed countries would be subject to similar challenges as their U.S. counterparts under the energy price increase scenarios developed for this study. Energy-intensive industries in other Annex 1 would also benefit from the cost-reducing flexibility provisions included in the U.S. proposal, and from an approach that assures developing country participation in emissions reductions will occur in the near future.

Q10. DOESN'T THIS REPORT PROVE SENATOR BYRD'S POINT THAT ENTERING INTO INTERNATIONAL AGREEMENTS WITHOUT THE FULL PARTICIPATION OF DEVELOPING COUNTRIES WOULD BE RUINOUS TO THE U.S. ECONOMY?

A10. The panelists felt that if less-developed countries did not adopt binding commitments to lower greenhouse gas emissions, they would capture an increasing share of the markets. The current Administration position, which was not reflected in the energy price scenarios considered by the panelists in mid-1996, is that developing countries should assume additional obligations in the near future to reduce the projected rapid growth of greenhouse gas emissions.

Q11. WHY DID IT TAKE THE DEPARTMENT SO LONG TO RELEASE THIS REPORT? WEREN'T THESE WORKSHOPS HELD OVER A YEAR AGO?

A11. The participants at the workshops focused their discussions around an initial draft of an expert author's paper. The expert authors then revised and clarified their papers over the following months in response to the panelists suggestions. Summaries of both the papers and the workshop proceedings were then forwarded to all participants for their review and to confirm that the workshop summary provided an accurate characterization of the workshop discussions.

Q12. THIS REPORT SHOWS HOW SOME INDUSTRIES WOULD BE HURT BY LARGE ENERGY PRICE INCREASES. WOULDN'T SOME INDUSTRIES, LIKE COMPACT FLUORESCENT BULB MANUFACTURERS, ACTUALLY BE HELPED? HOW COME THEY WERE NOT INCLUDED IN THE STUDY?

A12. The study focused on energy-intensive industries in order to develop information that would help in assessing the validity of the existing approaches to modeling the impacts of regime changes on energy use in the industrial sector, which accounts for over 1/3 of total U.S. energy use. The industries considered in this study account for over 80 percent of energy use in manufacturing. An understanding of the forces driving production decisions in these sectors is critical to comprehending and projecting the implications of alternative policy scenarios for the national energy market, a primary function of the Policy Office. Identifying changes in the relative performance of different economic sectors is also important. A second phase of our effort, which is now ongoing, is examining those industries that might benefit from higher energy prices.



cc: ANM
MJ
JS

White House Climate Change Task Force

734 Jackson Place, N.W. • Washington, DC 20503

FAX

To: % Alice Williams, For Janet Yellen

Organization/Title:

Fax: 395-6958

Phone: 395-5854

Pages (including cover): 12

Date: 7/14/97

From: Judi Greenwald

Phone: 343-1060

Message:

*Likely
friendly
question*

Q: I have a copy of a statement which I understand has been signed by more than 2300 economists, including eight Nobel laureates. That many economists agreeing on anything is impressive enough, but listen to what they said:

"Economic studies have found that there are many potential policies to reduce greenhouse gas emissions for which the total benefits outweigh the total costs. For the United States in particular, sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run."

If I understand this correctly, they're saying that policies to curb greenhouse gas emissions could actually improve the economy. How can this be?

A: Flexible policies, investments in new, more efficient technologies and substantial environmental benefits together produce outcomes where benefits of climate policies exceed costs.

The Administration is confident that the US private sector, given flexible policies and clear market signals, will move rapidly to provide the technologies the world will need to combat climate change. Under smart policies, U.S. businesses will not only save money and reduce dependence on foreign oil, but they will be better positioned to lead markets for the high efficiency technologies the world will need in the future.

Given flexible implementation, US businesses have outperformed even the most wildly optimistic expectations:

in acid rain, EPA predicted a cost of \$500-\$600/ton of sulfur emissions; under emissions trading the cost is only \$100/ton;

in the Montreal Protocol, we predicted a cost of \$3.50/kilo for a 50% reduction of CFCs; we're now looking at \$2.45/kilo for a complete phase-out.

The economists also recognize the great benefits of policies that improve the environment. Avoiding the human health, natural resource and economic impacts of climate change will greatly benefit the economy.

Clearly, we have a great opportunity to design policies which simultaneously protect the environment and boost economic performance. We look forward to working with the Congress and the American people to do that.

OPTIONAL FORM 10 (7-91)

FAX TRANSMITTAL		# of pages 9
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	Fax # 260-0275	

NSN 7540-01-317 7268 5000-101 GENERAL SERVICES ADMINISTRATION

ECONOMISTS' STATEMENT ON CLIMATE CHANGE

We the undersigned agree that:

I. The review conducted by a distinguished international panel of scientists under the auspices of the Intergovernmental Panel on Climate Change has determined that "the balance of evidence suggests a discernible human influence on global climate." As economists, we believe that global climate change carries with it significant environmental, economic, social, and geopolitical risks, and that preventive steps are justified.

II. Economic studies have found that there are many potential policies to reduce greenhouse-gas emissions for which the total benefits outweigh the total costs. For the United States in particular, sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run.

III. The most efficient approach to slowing climate change is through market-based policies. In order for the world to achieve its climatic objectives at minimum cost, a cooperative approach among nations is required—such as an international emissions trading agreement. The United States and other nations can most efficiently implement their climate policies through market mechanisms, such as carbon taxes or the auction of emissions permits. The revenues generated from such policies can effectively be used to reduce the deficit or to lower existing taxes.

ENDORSEMENT FORM

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SAN FRANCISCO, CA 94108

Likely
friendly
question

Q: The Administration has been assessing the costs of climate change policies for over a year. What are you finding?

A: [REDACTED]
[REDACTED]
[REDACTED]
The Administration's results are consistent with the lessons learned from a recent assessment by the World Resources Institute. Specifically:

Developing and diffusing new technologies will be a key to minimizing the costs of reducing greenhouse gas emissions. Investing in the development and dissemination of new energy-saving and low-carbon technologies will reduce overall costs and enable US companies to capture the emerging international market for these technologies.

International trading and joint implementation of commitments, as called for by the US, will increase the flexibility of countries in meeting treaty obligations and greatly reduce costs.

Actions will be implemented efficiently. Options being considered by the Administration will provide resources that can be used to offset distortionary fiscal policies.

Local air pollution will be reduced. Improving energy efficiency and increasing our use of clean-burning fuels will reduce both our emissions of greenhouse gases and traditional air pollutants. Greenhouse gas policies will significantly lower the costs of complying with new air quality standards.

The benefits of avoiding climate change are large. It is important to remember why we are taking these actions in the first place. The potential damages from climate change are great, including These costs will occur across countries and generations. It is not feasible or proper to attempt to add up the costs of climate change in a simple balance sheet. While we cannot simply monetize all of these costs, we should qualitatively compare the costs of our policies with the costs of doing nothing.

Q: Is it the intention of the Administration to adopt policies which would triple the price of coal, raise gasoline prices by 25 cents, and put thousands in energy intensive industries like coal mining out of work?

A: No, and the best and most recent work on the subject clearly shows that this would not be necessary. Robert Repetto of the World Resources Institute recently published a study of the cost of mitigating greenhouse gas emissions in which he concluded that efficiently implemented flexible policies that encourage investments in new technologies would actually generate net benefits to the overall economy. In addition, more than 2300 economists, including 8 Nobel Laureates, have said that many policies exist to reduce greenhouse gas emissions for benefits outweigh the costs.

We are confident that, working together, we can design policies that will meet the challenge of climate change while improving the US economy.

Revenue Recycling

Q: The Administration is considering an emissions cap-and-trade system. How will the Administration allocate permits? Does the Administration plan to auction permits, what does it plan to do with the revenue?

A: The Administration is considering an emissions cap-and-trade system. Market-based mechanisms are among the most efficient for addressing long-term environmental problems. We are evaluating a number of allocation and auction systems as well and other policies that could complement a cap-and-trade system or that could work in place of a cap-and-trade system.

As noted by Robert Repetto, in his recent review of climate change analysis, revenue recycling can be used to significantly offset the direct costs of reducing greenhouse gas emissions. We will continue to solicit comments from you, the public, and stakeholders on how to efficiently implement greenhouse gas reduction strategies.

Q: What are the potentially impacts on human health and the environment if climate change is left unabated? What are the consequences of inaction?

A: Climate change will have wide ranging impacts on human health, ecological systems, and socioeconomic sectors. Human health, natural ecological systems (e.g., water resources, coastal zones including wetlands and drylands, biodiversity), and socioeconomic systems (e.g., agriculture, commercial timber) are all sensitive to both the magnitude and the rate of climate change. The Intergovernmental Panel on Climate Change (IPCC) concluded in its 1995 Second Assessment that, "With the growth in atmospheric concentrations of greenhouse gases, interference with the climate system will grow in magnitude, and the likelihood of adverse impacts from climate change that could be judged dangerous will become greater."

Human health. The IPCC concluded that if climate change is left unabated, it "...is likely to have wide-ranging and mostly adverse impacts on human health, with significant loss of life." Health effects will potentially include increased incidences of illness and death from: (1) increased contributions of heat stress to cardiovascular and respiratory disease; (2) reduced air quality and increased levels of air borne pollen and spores which exacerbate respiratory disease, asthma, and allergic disorders; (3) extended geographic ranges of insects such as mosquitos and other disease carrying vectors which can increase the populations exposed to diseases such as malaria, dengue and yellow fever; and (4) ecological changes that can increase the incidence of cholera, diarrheal and other infectious diseases.

Socioeconomic sectors. Climate change poses risks to agriculture, coastal zones, and water resources. Climate change could adversely impact food production and increase the incidence of hunger and famine among the poorest populations of the world. Although total global food production may not substantially change, the effects will vary considerably across regions and localities, and some areas, including parts of the US, could sustain severe reductions in their ability to produce food. Rising sea level, if not addressed, can inundate large land areas, displace human populations, and place more people at risk of flood from storm surges. In the US, a 50 cm rise in sea level is estimated to inundate more than 5,000 square miles of dryland and 4,000 square miles of wetlands if no protective measures are taken. Measures to prevent or limit these effects would cost billions of dollars. Finally, climate change poses risks to the availability of fresh water. Relatively small changes in temperature and precipitation can cause large changes in water runoff, affecting the quantity and quality of water supplies for domestic and industrial uses, irrigation, hydropower generation, navigation, instream ecosystems and water based recreation. Also affected will be the frequency and intensity of floods and droughts.

Ecological systems. The impacts of climate change on the natural environment are difficult to predict. But impacts there most assuredly will be; some of them dramatic and many of them irreversible. The environmental impacts of climate change threaten to undermine our efforts to protect natural areas that provide habitat for wildlife, reservoirs

of genetic material for future medicines, foods and fibers, regulation of water runoff and flood control, and refuge from a modern world. For example, precipitation changes and salt water intrusion from sea level rise could adversely affect the ecological communities of the Florida Everglades and degrade this critical and unique habitat for many species of wading birds. The wetlands of the prairie pothole region of North America, which supports half the waterfowl population of this continent, could diminish in area and change dramatically in character in response to climate change. Such changes could be devastating to migratory bird populations and species survival.

Q: Why should we act today to reduce greenhouse gas emissions when there are so many uncertainties -- especially about the expected impacts? Shouldn't we wait until these uncertainties can be resolved?

A: It is a scientific fact that since the Industrial Revolution, the atmospheric concentrations of greenhouse gases have been increasing substantially due to human activities. There is strong scientific evidence that the continued addition of these gases into the atmosphere will alter global climate, increasing temperatures, changing rainfall and other weather patterns, and causing sea level to rise.

It is true that uncertainties remain about the timing, magnitude and regional patterns of these changes. But the best available science (as summarized in the 1995 Second Assessment of the IPCC) suggests that the wide range of potential impacts of climate change poses wide-ranging risks to human health, the economy, and the environment, that will add to existing stresses on resources caused by other factors such as population growth, land use changes, and pollution, resulting in a world very different than that which exists today. Climate change will pose risks for forests, wetlands, fisheries, coral reefs, and other ecosystems. In turn, these environmental effects will translate into economic impacts, and have possible repercussions for expenditures on health care, timber production, expenditures to protect our coastal areas and wetlands, prospects for hydropower generation, and agricultural productivity.

We need to deal with this problem now. The greenhouse gases that we emit into the atmosphere today will remain there for many decades -- and in the case of carbon dioxide, for centuries. How much we emit over the next years and decades will be determined by economic decisions we make today; for example, decisions about the type and energy efficiency of capital equipment that we invest in now. Consequently, if we delay taking action, more greenhouse gases will be emitted over time and we will leave the atmosphere with a higher concentration of greenhouse gases for the next century and beyond.

The emission reductions that we invest in today are a "down payment" to ensure that we can sustain our quality of life and economic growth in the future -- a down payment to ensure that human health, welfare and the environment are protected. Although scientific uncertainties still exist, current commitments may be viewed as an "insurance" investment; i.e., insurance against uncertain future "bad" impacts of climate change.

Furthermore, as the science of climate change improves and uncertainties are reduced, we may very well discover that the magnitude of the global warming problem is even worse than expected. Therefore, failing to reduce emissions now will mean that the eventual reduction will be even more drastic, if we want to prevent concentrations from exceeding a particular level. It is less expensive to begin to gradually reduce greenhouse gas emissions today, than to take no action and later institute draconian reductions.

Q: Won't we simply be able to adapt to any adverse effects? Haven't we done this for changes that we already have seen?

A: The rate at which climate change occurs may be the most important factor affecting both natural and managed ecosystems. The faster the warming, the harder it will be to adapt.

Temperature changes of the magnitude expected from the enhanced greenhouse effect have occurred in the past, but the previous changes took place over centuries or millennia instead of decades. The rate of increase in global temperatures will be greater than those which have occurred naturally over the last 10,000 years. However, the ability of natural ecosystems (forests, wetlands, barrier islands, national parks) to adapt to a rapidly warming climate is limited. Rates of natural migration and adaptation could be much slower than the rate of climate change. Populations of many species and inhabited ranges could decrease, and many may face extinction. The ultimate effects could last for centuries and would be virtually irreversible.

Intensively managed systems, such as agriculture, water resources and developed coastlines, may show more resilience to climate change than natural systems. Technological and management options exist which can, to some extent, cope with the stresses associated with a changing climate. However, it is difficult to currently design effective adaptation strategies because of uncertainties about the geographic location of impacts. These strategies also may be costly to implement.

Q: Isn't it true that any of the actions that are being contemplated for a protocol (e.g., stabilization of greenhouse gas emissions at 1990 levels) would have a negligible impact on future climate change and the resulting impacts?

A: It is not true that actions taken today will have a negligible impact on future climate change and the resulting impacts. Policy decisions in the near term -- particularly decisions about whether or not to begin reducing greenhouse gas emissions now -- will have long-term consequences.

Human-induced climate change is a complex problem, which can affect the quality of life for this and future generations. The lag time between emission of greenhouse gases and their impacts is on the order of decades to centuries; so too is the time needed to reverse any effects. Proactive measure taken today to begin reducing emissions of greenhouse gases will have two important effects: (1) They will influence the ultimate level of concentrations of greenhouse gases that occurs in the atmosphere; and (2) They will begin to slow the *rate* at which climate changes, which may have important implications for the ability of natural ecosystems to adapt to long-term climatic changes. The rate at which climate change occurs may be the most important factor affecting both natural and managed ecosystems. The faster the warming, the harder it will be to adapt.

In contrast, decisions not to reduce greenhouse gas emissions will have important long-term implications for human health and the environment. The longer emissions continue to increase, the greater reductions would eventually have to be to stabilize concentrations at a given level. However, the long atmospheric lifetime of many greenhouse gases, coupled with the thermal inertia of the oceans, means that the warming effect of anthropogenic emissions will be long-lived. Even with a stabilization of greenhouse gas concentrations in the year 2100, temperatures would continue to increase for several decades, and sea level would continue to rise for centuries.

Finally, actions taken today to begin reducing greenhouse gas emissions can be viewed as consistent with the "precautionary principle." If the climate changes more than expected, we will not have the option of returning the climate to that of today because the CO₂ will stay in the atmosphere for more than a century. It is therefore prudent to undertake some emissions policies that do not pose extreme risks to the U.S. economy as a precaution ("insurance") against this potential outcome.

Q: The World Resources Institute recently published "The Costs of Climate Protection: A Guide to the Perplexed" which shows that the assumptions made in the analysis have a great deal of influence over the results. What are the key assumptions being made by the Administration?

A: ~~While I cannot release specific results from the Administration's analysis until it has been completed with the peer review,~~ I can say that the Administration's results are consistent with the lessons learned from the WRI assessment:

Developing and diffusing new technologies will be a key to minimizing the costs of reducing greenhouse gas emissions. Investing in the development and dissemination of new energy-saving and low-carbon technologies will reduce overall costs and enable US companies to capture the emerging international market for these technologies.

International trading and joint implementation of commitments, as called for by the US, will increase the flexibility of countries in meeting treaty obligations and greatly reduce costs.

Actions will be implemented efficiently. Options being considered by the Administration will provide resources that can be used to offset distortionary fiscal policies.

Local air pollution will be reduced. Improving energy efficiency and increasing our use of clean-burning fuels will reduce both our emissions of greenhouse gases and traditional air pollutants. Greenhouse gas policies will significantly lower the costs of complying with new air quality standards.

The benefits of avoiding climate change are large. It is important to remember why we are taking these actions in the first place. The potential damages from climate change are great, including [see climate benefits q & a]. These costs will occur across countries and generations. It is not feasible or proper to attempt to add up the costs of climate change in a simple balance sheet. While we cannot simply monetize all of these costs, we should qualitatively compare the costs of our policies with the costs of doing nothing.

Draft Q&As

7/12/97

NOTE TO MICHELLE JOLIN

RE: Climate Change Hearings

Attached are a number of background questions and answers for next week's climate change hearings. These should also be reviewed with Mark and in light of any relevant discussions on Friday.

If you have any questions, I can be reached at home this weekend at 301/656-3272.

Thanks,

Steve Seidel

draft 7/12

BACKGROUND QUESTIONS AND ANSWERS ON CLIMATE CHANGE

Q. When will the Administration release its economic analysis of the costs of acting to reduce greenhouse gas emissions?

A. -- We intend to release this report by the end of the month.

-- The report will summarize the current understanding from the economics literature and discuss how the analysis we have undertaken fits into that broader picture.

Q. The Administration has been working on this analysis for several years and promising it to Congress and the public for almost that long. Why have you withheld this information for so long a time?

-- By its very nature, climate change is a long-term issue requiring analysis that spans many decades.

- Needless to say, neither energy models or economics models do a very good job of forecasting over a such a long period of time.
- It's critical to recognize that there is no "right" model and no "right" answer.
- Nonetheless, as the analysis has progressed we have learned quite a bit both about the models themselves and about the implications for policy design.
- This has taken time. Longer than we thought it would take. But it nonetheless has and will continue to be useful in guiding our policy process.
- We look forward to issuing this report and continuing the dialogue about the appropriate actions to address climate change and its impact on the economy.

Q: How can the Administration be off negotiating an international treaty without having completed its analysis and without having had a public dialogue about the impact of such actions on American jobs and our economy?

- A:
- The Administration's position in the negotiations has been informed throughout by the economic analysis in the literature and its on-going analytical efforts.
 - For example, we have rejected proposals calling for significant near-term reductions in emissions because we think they are too costly.
 - We have also pushed for flexibility in how a target is set (e.g., multi-year, banking and borrowing) and for the use of market-based approaches (emissions trading and joint implementation), because we believe that these approaches will be substantially reduce the costs of achieving any given target.
 - We have not, however, yet proposed any specific target or timetable. This obviously critical dimension of our position must await further analysis and dialogue as the President clearly stated in his speech at the United Nations last month.

Q: A copy of the Administration's draft analytical report has been circulated widely. How will the final report differ from that draft?

- I believe it is generally inappropriate to comment on details of a draft report.
- I will say however that we got a number of useful comments from the peer reviewers that will substantially alter the draft report.

-- For example, the reviewers thought it was important to put our analysis in the context of the existing economics literature on climate change impacts. We will be doing this in the final draft.

-- The reviewers also thought we placed far too great an emphasis on the results from a macroeconomic model (DRI) and that such a modeling approach is largely inappropriate for looking at changes on a timescale beyond a few years.

Q: When will the Administration release its peer review comments?

A: -- We intend to release the comments received from peer reviewers by the end of the month when our report is made publicly available.

Q: We remain very concerned that the Administration is going to agree to actions in Kyoto that will cripple our economy and drive jobs overseas? Can you assure us that we would not sign on to any such agreement?

A: -- The President has stated that he would oppose any plan that would be harmful to our economy, but that he believes we can take and need to take prudent steps to begin addressing this issue, and that we can do so consistent with continued economic prosperity.

-- We have opposed proposals calling for significant near-term reductions that could adversely impact on our economy.

-- We need to avoid causing costly premature retirement of our nation's capital stock, while at the same time spurring research and investment in the energy technologies that will lead us and the world into the next century.

-- In his recent speech at the United Nations, the President made a strong commitment to channel our technological prowess toward producing the energy solutions for the next century.

-- While taking steps to reduce greenhouse gas emissions will not be free, we also have to keep in mind that there are costs of a changing climate associated with not acting to reduce greenhouse gas emissions.

Q: Many in Congress are very concerned that the current negotiations are simply a bad deal for the American public. Why should we incur costs to reduce emissions when developing countries are not required to do anything? From an economic perspective, how can you advise the President that this path makes sense?

A: -- Equity is often an important part of any economic discussion. Since the U.S. is the largest emitter of greenhouse gas emissions and developed countries are responsible for about 75% of emissions in the atmosphere, we have a responsibility to show leadership.

-- However as developing countries economies grow and as their emissions grow, the U.S. proposal calls on them to incur increasing obligations.

-- Specifically, the U.S. proposal calls for agreement on a date certain by which developing countries would agree to negotiations for them to take on binding obligations.

Q: The Dept. of Energy through Argonne Labs conducted a study of 7 basic manufacturing industries that are critical to the U.S. industrial base. Press accounts report that this study concluded that the current negotiations are likely to lead to widespread shifts in these industries from the U.S. to developing countries with huge job loss here. Why has DOE withheld this study from the public? Do you disagree with its findings?

Not being withheld

-- I am not personally familiar with this study. But I have been told that the Argonne study does not take into consideration any of the flexibility contained in the U.S. position and assumes incorrectly that developing countries never take on any obligations. Thus, the study in no way represents an analysis of what the U.S. has proposed during these negotiations.

Q: The draft Administration analytical report states that stabilizing greenhouse gas emissions at 1990 levels in 2010 would result in throwing 900,000 workers out of jobs. How can the Administration even contemplate entering into such an agreement?

A: -- I am certain that we would not agree to a proposal that would have that impact.

-- There are many dangers in working from a draft report.

-- The numbers you cite are based a scenario that doesn't reflect U.S. positions in these negotiations calling for flexibility and market-based approaches. In addition, they are based on a macroeconomic model that our peer reviewers criticized as being inappropriate for this type of analysis.

-- We have worked hard to achieve the most robust economy in the world and if we continue to work together we can develop the technologies that address this problem and enhance our economic prowess.

-- Our partnership with the U.S. automakers is a good example of what we hope to be able to achieve through technological progress. The goal of the Partnership for New Generation of Vehicles is to achieve three times

today's fuel efficiency without increasing costs or sacrificing safety. If successful, this one technological program would go along way toward reducing greenhouse gas emissions.

Q: The draft Administration's analysis suggests that gasoline prices will increase 35 cents per gallon and coal prices will triple in order to stabilize emissions at 1990 levels. Is the Administration prepared to ask Congress for this new tax and does it really think we would approve such a measure?

- A: -- The Administration has not made any decision on a specific target and timetable and therefore, I cannot comment on possible increases in energy prices that might result.
- Our goal in developing a specific proposal will be to allow for adequate lead time to avoid costly capital stock retirements and to allow for the development of alternative technologies that can reduce the costs of compliance.
- As President Clinton stated at the United Nations, if we can channel the ingenuity of American industry, academia and government labs to work on solving this problem, this could become an economic opportunity rather than a burden.

Energy and Power Subcommittee
House Commerce Committee

Dan Schaefer (R-CO), Chair--mostly interested in restructuring

Michael Crapo (R-ID)

Michael Bilirakis (R-FL)

Dennis Hastert (R-IL)

Fred Upton (R-MI)

Cliff Stearns (R-FL)

Bill Paxon (R-NY)

Steve Largent (R-OK)

Richard Burr (R-NC)

Edward Whitfield (R-KY)

Charles Norwood (R-GA)

Rick White (R-WA)

Rick Lazio (R-NY)

Barbara Cubin (R-WY)

Ralph Hall (D-TX), Ranking Min.

Elizabeth Furse (D-OR)--friendly; OR already has state rules addressing greenhouse gas emissions, using a market-based approach

Bobby Rush (D-IL)--friendly

Karen McCarthy (D-MO)--friendly

Albert Wynn (D-MD)

Ed Markey (D-MA)--friendly

Rick Boucher (D-VA)--cares a lot about coal

Edolphus Towns (D-NY)

Frank Pallone (D-NJ)--has introduced an electricity restructuring bill with a CO2 cap

Sherrod Brown (D-OH)

Bart Gordon (D-TN)

Peter Deutsch (D-FL)--worried about sea level rise

Tom Bliley (R-VA), Full Committee Chair, might attend--very upset with Administration not providing economic analysis, has sent us a letter asking for the peer review comments

John Dingell (D-MI), Full Committee Ranking, might attend--has launched GAO investigation of the IAT, upset about lack of analysis, like Senator Byrd, thinks developing countries should have obligations, too

Warning: DOE sent the Argonne report up to the Hill on Friday, so there may be a lot of questions about it.

ONE HUNDRED FIFTH CONGRESS

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U.S. House of Representatives
Committee on Commerce
Room 2125, Rayburn House Office Building
Washington, DC 20515-6115

July 11, 1997

JAMES E. O'DONNELL, CHIEF OF STAFF

Mr. Dirk Forrister
Chairman
White House Climate Change Task Force
734 Jackson Place, N.W.
Washington, D.C. 20503

Dear Mr. Forrister:

As you certainly are aware, the Subcommittee on Energy and Power is planning to hold a hearing on Tuesday, July 15, 1997, on the "Economic and Environmental Impact of the Proposed International Global Climate Change Agreement." Under Secretary for Global Affairs, Tim Wirth, is presently scheduled to testify. We are writing to reiterate our prior request that the Administration provide, in addition to Mr. Wirth, a witness who can answer questions regarding the Administration's economic analysis and assessment efforts and the recent draft report of May 16, 1997, entitled: Economic Effects of Global Climate Change Policies, Results of the Research Efforts of the Interagency Analytical Team ("draft analysis and assessment"). Although Commerce Committee staff requested the Administration provide such a witness over a week ago; we still have not received a response.

Over two years ago the Administration committed the United States to negotiate new commitments to address the issue of global climate change. At the same time, the Administration committed to undertaking analysis and assessment to determine the appropriate level of commitments. In June, 1996, a workshop was held in Virginia on analysis and assessment. However, that effort proved inadequate and last September Everett Ehrlich, Under Secretary of Commerce for Economic Affairs, stated that a new analysis and assessment would be completed late last year or early this year. Nonetheless, the Administration has not yet released the analysis and assessment.

Recently, the Administration circulated its draft analysis and assessment for peer review comments. Those peer reviewers (selected by the Administration) were given until the end of May to submit comments on the draft. The Administration now has had those comments for far longer than the peer reviewers were given to submit comments. In the continued absence of the final analysis and assessment, we also request the Administration provide to the Committee copies of the

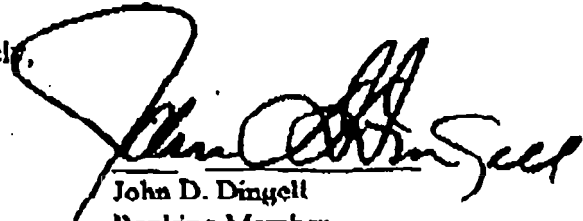
Mr. Dirk Forrister
July 11, 1997
Page 2

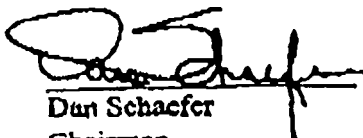
peer reviewers' comments prior to the hearing and, in addition, provide a witness to answer questions regarding the Draft analysis and assessment.

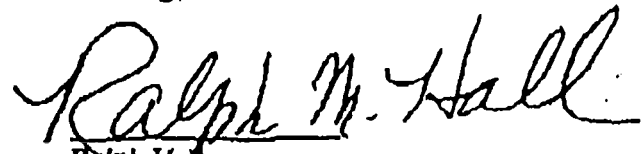
We thank you for your attention to these concerns.

Sincerely,


Tom Bliley
Chairman


John D. Dingell
Ranking Member


Dan Schaefer
Chairman
Subcommittee on Energy and Power


Ralph Hall
Ranking Member
Subcommittee on Energy and Power

cc: The Honorable Tim Wirth, Under Secretary for Global Affairs
Department of State

DRAFT
7/11/97

Statement of
The Honorable Timothy E. Wirth
Under Secretary of State for Global Affairs

before the

Subcommittee on Energy and Power
Committee on Commerce
U.S. House of Representatives
July 15, 1997

To: M. John
F. Hirth
Formal copy only
Shirley

Chairman Schaefer and Members of the Subcommittee...

I am pleased to be with you today to discuss the ongoing negotiations toward next steps under the United Nations Framework Convention on Climate Change. These negotiations began in August 1995 and should end in December, at the Third Conference of the Parties in Kyoto, Japan, with the adoption of a new protocol or other legal instrument.

In his address last month to the United Nations General Assembly Special Session, President Clinton recognized that the United States must do better on climate change. He noted that "[w]ith 4 percent of the world's population, we already produce more than 20 percent of [the world's] greenhouse gases." The President committed himself to engage the American people and the United States Congress in a dialogue to explain the real and imminent threats from climate change, the economic costs and benefits involved, and the opportunities that American technology and innovation can provide. The President also committed to "bring to the Kyoto conference a strong American commitment to realistic and binding limits that will significantly reduce our emissions of greenhouse gases."

In recent weeks, interest in the negotiations has intensified, particularly in the Congress. The Administration welcomes this interest and wants to encourage the broadest possible dialogue as we work toward a new agreement in Kyoto.

Climate change is a long-term problem that will not be solved overnight. Still, prudence dictates that we take some measures now - early action can preserve future options and enable us to respond seriously and sensibly to an environmental threat that may eventually dwarf all others we will face.

While I know many of you are aware of the basic facts, I think it may be useful to reiterate a few of the most crucial points that the scientific community has established.

The "greenhouse effect" is caused by gases such as carbon dioxide, methane and nitrous oxide, which accumulate in the atmosphere and trap solar radiation, thus making the planet warmer than it otherwise would be. The natural levels or concentrations of these

side contact
Rodrigo Prudencio
647-8745

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greenhouse gases in the atmosphere keep temperatures within a range that can support life. (By way of comparison, Mars, a planet with no greenhouse gases, has an average surface temperature of TK; and Venus, a planet with very high concentrations of these gases, has an average surface temperature of TK.)

Human beings increase the concentrations of greenhouse gases in the atmosphere primarily by the burning of fossil fuels -- coal, oil and natural gas. Changing land use patterns, particularly deforestation and soil erosion, also play a role, by reducing the capacity of the natural environment to absorb carbon from the atmosphere. Since the industrial revolution in the 18th century, the concentration in the atmosphere of carbon dioxide, the most important greenhouse gas, has risen 30%; during the same period, methane concentrations have doubled, and nitrous oxide concentrations have risen by about 15%. Overall, greenhouse gas concentrations have increased from 280 parts per million (ppm) to about 366 ppm today.

Since pre-industrial times, the Earth has warmed about one degree Fahrenheit. Scientists believe that the observed increase is unlikely to be entirely natural in origin. In its most recent scientific assessment, the Intergovernmental Panel on Climate Change (IPCC) concluded that the balance of evidence suggests "a discernible human influence on the climate system."

Projections of future climate change, based on complex climate models and on our best understanding of the physics of the climate system, suggest a rise of another two to six and a half degrees Fahrenheit by 2100, with an average increase greater than any seen in the last 10,000 years. This warming will not be uniform -- it is likely to be greater at higher latitudes and at the poles.

Sea level is projected to rise an additional one and a half feet by 2100 due to thermal expansion of the oceans and to the melting of glaciers and ice sheets. This would flood 9,000 square miles of coastal areas here in the United States, notably in Florida and Louisiana, and put about 100 million people world-wide at risk each year from storm surges.

In other words, the path we are on is cause for significant concern. Climate change is likely to have wide-ranging and mostly adverse effects on human health. Both natural and managed ecosystems are at risk. The viability and location of forest and agricultural zones will change significantly.

In 1992, the world community adopted the United Nations Framework Convention on Climate Change in an effort to begin coming to grips with this environmental threat. Under the Convention, developing nations agreed to take a variety of actions to mitigate climate and to facilitate adaptation to its consequences. Industrialized nations agreed to take the same actions, but in addition, they agreed to adopt policies and measures aimed at returning their emissions of greenhouse gases to 1990 levels by the year 2000.

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Industrialized nations thus agreed to do more than developing nations. They did so because they recognize they were contributing more to the build-up of greenhouse gases concentrations in the atmosphere. In addition, they recognized that their more-fortunate economic circumstances give them a greater current capacity to respond to this threat to the global environment.

This agreement on the part of industrialized nations to do more under the Climate Convention was neither surprising nor unusual. Fortunately, industrialized nations have often taken the lead in protecting the environment, whether locally in eliminating the use of leaded gasoline or globally in phasing out the use of substances that deplete the stratospheric ozone layer. Particularly in the case of the Montreal Protocol to protect the earth's ozone layer, developing nations have followed and are following suit, having been encouraged by the example of industrialized nations and supported with funding and technology.

In 1995, the Parties to the Climate Convention decided the existing treaty commitments were not adequate to address the threat. Accordingly, they agreed to begin a process to negotiate next steps. Since the "aim" set for industrialized nations expires in the year 2000, they began to consider the goals that should guide their efforts in the decade or two after the year 2000. At that time, developing nations, many of whom had only begun to implement their existing commitments under the Convention, argued strenuously that the negotiating process should not result in new commitments for them. They agreed, however, to continue to advance the implementation of their existing commitments.

Industrialized nations agreed to do more. In particular, they agreed to establish quantified targets to limit and reduce their greenhouse gas emissions over yet-to-be-determined time periods -- such as 2005, 2010 or 2020. At their Second Conference in July 1996, in response to the U.S. call, a significant majority of the Parties agreed that these quantified targets should be legally-binding.

Since last year, much has happened. I would like today to focus on two growing concerns -- the concern that actions taken under the Climate Convention should relate to a specific environmental objective; and the concern that developing nations must acknowledge the role they will need to play in meeting any such objective.

Under the Convention, all Parties agreed that their "ultimate objective is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system." They also agreed that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

Unfortunately, it is too early in our understanding of the environmental threat, and of the costs of action and inaction, to know at what level we should seek to stabilize

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atmospheric concentrations of greenhouse gases to meet the Convention's ultimate objective. However, unless significant actions are taken in the next century, it is very likely that atmospheric concentrations will, by the year 2100, nearly triple the pre-industrial level and rise higher than any point in the last 60 million years.

I should note that virtually all the studies on the effects of climate disruption have focused on predicted doubling of atmospheric concentrations of greenhouse gases. But adverse effects on the earth's environment will not stop at a doubling of atmospheric concentrations, and changes to our climate system will continue, most likely along unpredictable paths.

So, while we cannot yet say what precise level of atmospheric concentrations will "prevent dangerous human interference with the climate system," we know that the risks we face increase dramatically as concentrations continue to rise. We can also work backward from the stabilization of atmospheric concentrations at some particular level to determine the corresponding limits on global emissions and the time frames in which these would need to occur.

We know, that without significant reductions, our current emissions trends put us on the road to increasing concentrations up to three or four times current levels. To avoid this outcome, countries, including the United States, must act soon to reduce their emissions. What we do now has direct implications for future concentration levels.

Action by industrialized nations alone will not put us on the road to safe concentrations of greenhouse gases; we need action by the developing countries as well. But if the developed countries don't reduce emissions -- with our current technical capacity and our energy intensive life-style -- then developing countries will not act either. We must lead the way. And we must move soon. If not, a doubling of concentrations becomes certain, and we put ourselves on the road to a tripling or even higher levels of concentrations -- the consequences of which are uncertain but likely to be catastrophic.

The U.S. proposals in the current negotiations speak to each of the issues I have described here. Recognizing the need to translate the Convention's ultimate objective into a policy, Article 2 of the U.S. proposal calls on the Parties to cooperate in the establishment of a long-term goal with respect to atmospheric concentrations of greenhouse gases. Note, however, that the U.S. proposal also recognizes that our current understanding does not yet enable us to establish such a goal. Considerably more research will be needed to do so.

The U.S. proposal to establish an Annex B to the protocol or other legal instrument acknowledges that the list of "developed country Parties" established by the Convention's Annex I in 1992 no longer reflects current realities. A number of countries have since joined the ranks of the developed world and others are poised to do so shortly. Annex B would enable such countries on a voluntary basis to take on binding greenhouse

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gas emissions obligations – which could be growth budgets – that would then enable them to engage in emissions trading with industrialized nations.

Similarly, Article 16 of the U.S. proposal calls on the Parties to adopt, by 2005, binding provisions so that all Parties, including developing countries, have quantitative greenhouse gas emissions obligations and so that there is a mechanism for automatic application of progressive greenhouse gas emissions obligations to Parties, based on agreed criteria.

This aspect of the U.S. proposal, also known as "Evolution" troubles most countries, including several developed countries, who believe it imposes unfair burdens on developing countries. Others, including many in Congress, believe that it does not go far enough – in their view, any next steps under the Convention must include quantified emissions objectives for developing countries to limit or reduce their greenhouse gas emissions as well. Still others suggest that the Kyoto agreement should also encompass a "Kyoto Mandate" requiring key developing countries to accept quantified emissions limitation or reduction commitments. These commitments would be triggered on the fulfillment by industrialized countries of their commitments in the first emissions budget period agreed upon.

I submit that the issue is not whether key developing countries take on quantified commitments to limit or reduce their emissions of greenhouse gases – clearly, it will be impossible to abate the threat of climate change unless they do. The issue is when such commitments should begin, and what criteria should be used to establish them, and to whom they would apply.

Some in the developing world point to significant disparities in national income between those in industrialized nations and those in developing nations. Others in the developing world point to significant differences in per capita levels of greenhouse gas emissions between industrialized and developing nations. Both groups have suggested that developing countries should not be expected to accept quantified emissions limitation or reduction commitments until such time as their level of national income or their level of national emissions on a per capita basis approaches those that prevail in the industrialized world.

While arguments on both bases are understandable, both miss two key points. First, the environmental threat posed by global climate change cannot be averted if nations wait to act until levels of national income or per capita emissions converge at some theoretical point in the future. Second, industrialized nations simply will not make significant efforts to reduce their greenhouse gas emissions if their efforts will be undermined by an unlimited increase in emissions from the developing world.

The environmental threat we face demands that nations responsible for the largest share of current emissions, and those whose emissions are growing rapidly, act in tandem to protect the Earth's climate system. The Framework Convention to which the Senate

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gave its advice and consent in 1992 established the principle that the world's nations have common but differentiated responsibilities and capabilities. Insisting that developing nations immediately accept binding emissions targets that industrialized nations are seeking to negotiate for themselves is neither realistic nor consistent with the Convention approved by the Senate. At the same time, insisting that those developing nations now responsible for a significant and growing share of global greenhouse gas emissions should have no further obligations to act until they have crossed some threshold of national income or emissions on a per capita basis is equally unrealistic and inconsistent with the Convention's ultimate objective.

The agreement reached in Kyoto will not solve the problem of global climate change. No matter how ambitious, it will represent only a second step along the much longer path toward achieving the Climate Convention's ultimate objective. As we prepare for Kyoto, we must also prepare for further steps beyond it. In particular, we must ensure that all nations responsible for a significant share of current global greenhouse gas emissions accept the need to limit or reduce their emissions, and that they begin to move in that direction.

What a Kyoto agreement can do is provide nations with the tools they will need to achieve to achieve significant, binding greenhouse gas limitation and reduction commitments. These tools include greenhouse gas emissions budgets over multiyear budget periods that will help smooth out annual fluctuations. They include full national flexibility in the choice of policies and measures to meet such binding emissions budgets. They include emissions trading among nations with binding emissions budgets, with the participation of the private sector in the trading regime, to help lower the costs of compliance. And they include joint implementation for credit between nations with binding emissions budgets and those that do not yet have such budgets both to lower the costs of compliance and to promote economic development and environmental protection.

Mr. Chairman, we have indeed charted an ambitious course for the months ahead. With your continued support and the support of other Members of Congress, I am confident that we will obtain an outcome in Kyoto that will represent a significant step forward on the much longer path toward safeguarding the Earth's climate system for present and future generations.

Thank you, Mr. Chairman.

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JAMES E. DERDERIAN, CHIEF OF STAFF

**U.S. House of Representatives
 Committee on Commerce**

**Room 2125, Rayburn House Office Building
 Washington, DC 20515-6115**

July 11, 1997

The Honorable Janet Yellen
 Chair
 Council of Economic Advisors
 Old Executive Office Building
 Washington, D.C. 20502

Dear Ms. Yellen:

I am writing to confirm the invitation to you to testify before the Subcommittee on Energy and Power on Tuesday, July 15, 1997, at 1:00 p.m. in Room 2123 Rayburn House Office Building. The topic of the hearing is the "Environmental and Economic Impact of the Proposed International Global Climate Change Agreement." The focus of this hearing will be the upcoming climate change meetings in Bonn, Germany and steps the Administration is taking to prepare for future international negotiations on this topic.

You are requested to submit a written statement which may be of any reasonable length and may contain supplemental materials; however, the Committee cannot guarantee that all such material will be included in the printed hearing record. Your written statement should be typed, double spaced, and should include a one-page summary of the major points you wish to make. To allow sufficient time for Members to ask questions, your oral presentation should be limited to five minutes.

Rule 4(b)(1) of the Committee rules, which are enclosed, requires that you provide the Committee with 75 copies of your written statement at least two working days in advance of your appearance. This will allow Members and staff the opportunity to review your testimony. On the day you appear before the Subcommittee, please bring an additional 75 copies of your testimony to satisfy anticipated interest in this hearing.

Rule 4(b)(1) also requires that, to the greatest extent practicable, you submit a copy of your testimony in electronic format. The testimony will be converted to HTML or Adobe Portable Document Format and posted to the Committee Website at "<http://www.house.gov/commerce/welcome.html>" after the hearing. Electronic submittal will increase public access to your testimony, and reduce Committee printing costs. Submission of testimony in electronic

The Honorable Janet Yellen
July 11, 1997
Page 2

form does not relieve a witness of the obligation to submit the requested number of printed copies of his or her testimony. Guidelines for submission of testimony in electronic format are enclosed.

Please send the electronic and printed copies of your testimony needed two working days before the hearing to the attention of the Legislative Clerk for the Committee on Commerce in 2125 Rayburn House Office Building, Washington, D.C. 20515.

If you have any questions concerning your testimony, please contact Ms. Catherine Van Way of the Commerce Committee staff at (202) 225-2927.

Sincerely,



Dan Schaefer
Chairman
Subcommittee on Energy and Power

Attachments: (1) Electronic Format Guidelines
(2) Rules for the Committee on Commerce (not faxed)

THE HOUSE COMMITTEE ON COMMERCE



Guidelines for the Electronic Submission of Congressional Testimony

The Rules of the House Commerce Committee require each witness, to the greatest extent practicable, to submit a copy of their testimony in an electronic format prescribed by the Chairman. Testimony submitted in electronic form will be used to produce the printed hearing record, and also may be converted to HTML or Adobe Portable Document Format and posted after the hearing to the Committee on Commerce website at <http://www.house.gov/commerce/welcome.html>. Your compliance with this requirement will facilitate the distribution of your testimony, and help the Committee to minimize the costs of printing the hearing record.

Materials submitted to the Committee for electronic publication must be formatted in one of the formats listed below.

1. Windows Environment

- a. 3.5 disk DOS/Windows format disk, either 720k or 1.44MB format
- b. The following file formats will be accepted:
 - 1) Word 7.0 or earlier;
 - 2) WordPerfect 6.1 or earlier; and
 - 3) ASCII or ANSI text files.

2. Macintosh Environment

- a. 3.5 inch Macintosh high-density format disk
- b. The following file formats will be accepted:
 - 1) Word 6 or earlier;
 - 2) WordPerfect 3.5 or earlier; and
 - 3) Macintosh text file.

Please label your disk with the following information: 1) Witness Name; 2) Witness Organization; and 3) Name and Date of Hearing; and 4) the file format used.

In addition to submitting testimony in the two formats listed above, witnesses may also submit a second copy of their testimony in Hypertext Markup Language (HTML) or Adobe Portable Document Format. Testimony submitted in HTML may not include external hypertext links in the testimony.

The submission of testimony in HTML format does not relieve the witness of their obligation to submit electronic versions in one of the Windows or Macintosh formats, or to submit written testimony as prescribed in the letter of invitation.

Memo

To: Dirk

From: Tom

Re: July Congressional Hearing Schedule And Witness Requests

Date: Monday, July 07, 1997

343-1060
Dingell

Kathy Way
225-2927
Thursday, July 10 - Senate EPW Committee - Chafee/Baucus

No request for administration appointees. Panel 1: Scientists. Panel 2: Economists.

224-6176
9:30
Tuesday, July 15 - House Commerce Subcommittee On Energy and Power - Schaeffer/Pallone

Tim Wirth invited and nominated to discuss international negotiations and economics/trade issues (no other administration witness nominated).

Thursday, July 17 - Senate EPW Committee - Chafee/Baucus

Tim Wirth invited and confirmed to discuss international negotiations and economics/trade issues. If we want a separate witness to handle economics issues we should call staff director Jimmy Powell immediately with a nominee, otherwise they intend to question Tim Wirth. Panel 1: Administration witnesses. Panel 2: Business leaders.

Thursday, July 24 - House International Relations Committee - Gilman/Hamilton

Line up and agenda unclear. Probable request for an administration witness to discuss negotiations (Wirth ?) and economic/trade implications (?).

↳ also USAID

Late July - Senate Commerce, Science and Transportation - McCain/Inouye

Possible, but no confirmation of dates or agenda.

Admin could
→ try to get some
"friendly"
members to show
up at this
hearing to raise
profile
issue of
climate
change

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Please deliver the following agenda and dicussion paper to your principal for tomorrow's 2:00pm Climate Change Meeting
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Agenda
NEC/CEQ Principals Meeting
Climate Change
July 11, 1997

- I. Interagency Decision Process
- II. Domestic Emissions Trading

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CLIMATE CHANGE POLICY WORKGROUPS

1. Domestic Policies

- A. Domestic Emissions Trading
- B. Technology Policy
- C. Transition Assistance
- D. Regulations and Standards

2. International Policies

- A. International Emissions Trading & Joint Implementation
- B. Developing Country Issues
- C. Enforcement/Compliance

DISCUSSION PAPER:

DOMESTIC EMISSIONS TRADING PROGRAMS
FOR GREENHOUSE GASES

1. Introduction

Under emissions trading programs, emissions allowances are first allocated or auctioned. These allowances may then be traded. Allowances can have substantial value, so distributional issues are an important component of program design.

Emission trading programs offer both static and dynamic efficiency advantages over more traditional forms of regulation. Trading allows those with higher abatement costs to purchase allowances from those whose costs are lower. Total costs will therefore be lower than under traditional regulation, which require all polluters to comply with a specific standard. Nevertheless, emissions trading may often involve people and firms adjusting to higher prices.

Under traditional regulation, firms have little incentive to abate pollution by more than the minimum required. As a result, firms under-invest in pollution control R&D. Emissions trading offers dynamic efficiency gains by creating incentives to continuously improve pollution abatement technologies in order to generate surplus allowances for sale.

2. US Experience with Emissions Trading

The US has had more experience with emissions trading than any other country. Examples include:

Sulfur Dioxide (SO₂) Allowance Trading: The Clean Air Act Amendments of 1990 required a 50% reduction in SO₂ emissions from electric utility boilers. To accomplish this goal, a fixed number of emission allowances were allocated to electric utilities based on a formula reflecting historical emissions. In addition, a small portion of allowances are auctioned every year to facilitate price discovery and new entrants. Allowances are specifically excluded from being defined as rights to pollute, may be traded to any party anywhere, and may be banked for use in future years. Participants need to conduct regular monitoring of emissions and make an annual accounting of their emissions. Penalties are imposed if emissions exceed the number of allowances held by a source.

A functioning market in SO₂ allowances now exists, involving both bilateral exchanges between companies, and brokered exchanges through third parties. This market, along with other factors,

These include the fact that the target that was actually adopted was not as onerous as many in industry had feared, the low price and widespread availability of low sulfur coal, the awarding of bonus allowances, the postponement of trading investments, and lower than expected transportation costs

has helped to dramatically reduce the cost of the abatement program.

Initially, forecasters claimed that a 50% reduction (10 million tons) in SO₂ would correspond to allowance prices in the range of \$400 to \$1000. Hahn, Robert W., and Carol M. (The Behavior of the Allowance Market: Theory and Evidence.) The Electricity Journal

, March, 1994. However, prices for allowances that would be needed in the next decade to achieve this level of emission reduction currently range between \$100 to \$120. In addition, 1995 emissions were actually 40% below the legally required levels for that year.

Water Effluent Trading: The US generally has regulated surface water quality through a system of discharge limits for large sources of water pollution. In addition, states have standards for ambient water quality which are often not attained even after large dischargers apply best technology. The reason is that small (nonpoint) sources (such as runoff from farms) contribute significantly to water pollution. A number of state and local governments are employing trading systems for watersheds that either permit trading among large dischargers, or allow large dischargers to fulfill their requirements by controlling nonpoint sources. These include the Fox River in Wisconsin, the Dillon Reservoir in Colorado, and the Tar-Pamlico River in North Carolina. The latter two programs are designed to manage future economic growth. Thus, the quantity of effluent

allowances allocated exceeds current discharge levels. Once growth consumes this excess, trading is expected to reduce compliance costs.

Inter-refinery Lead Trading: EPA operated a lead trading program from 1983 to 1987 as it phased out lead from gasoline. Lead trading allowed refiners and importers to trade lead reduction credits in order to meet limits for the lead content of gasoline. The quantity of allowances to which a firm was entitled was determined by the amount of leaded fuel produced by the firm and the contemporaneous EPA standard. Those who bettered the standard could sell their credits to others. Some 10 billion grams of lead were traded during the course of the program at prices ranging from 0.75 to 5 cents per gram. Allowing the trading of lead credits reduced the costs of the program by approximately 20 percent.

Criteria Air Pollutant Trading: EPA first began incorporating aspects of emissions trading in its air program in 1974, when it allowed a modified source to use credits earned by another source within the same plant to avoid additional regulatory requirements. Since then, emission trading has substantially expanded. Trades have numbered in the thousands and have been estimated by Hahn and Hester (1986) to have achieved savings between \$525 million and \$12 billion.

Market Mechanisms for Chlorofluorocarbon (CFC) Phaseout: Under the 1987 Montreal Protocol to limit stratospheric ozone depletion, the U.S. required the phase out of the production of CFCs by 1996. As part of its program, the U.S. adopted a tradeable permit regime covering CFC manufacturers and importers. These allowances were allocated based on each firm's 1986 market share. As the market for CFCs declined, the system allowed firms to allocate production among different facilities according to the least-cost pattern of supply. It also gave CFC users the flexibility to switch between different CFC compounds, within the overall limit on allowances. This program helped reduce the costs of the phaseout. In 1988, EPA estimated that the cost to *halve* CFC use would be \$3.55 per kilogram. By 1993, it became clear that all uses could be *eliminated* by 1996 at a cost of \$2.45 per kilogram.

3. Emissions Trading of Greenhouse Gases

A greenhouse gas emissions trading program would likely contain several elements. First, emissions budgets would be established. Some entity or entities would be given responsibility for verifying compliance and the integrity of allowances. Noncompliance with allowance limitations or reporting requirements would result in penalties. The program would establish permit lifetimes, monitoring and enforcement provisions, and rules for permit banking, borrowing, and trading.

Among the important issues to be addressed in designing a domestic emissions trading program are:

--Where the constraint is imposed. A primary fuel trading program would limit the production or import of fossil fuels. A sectoral trading program would limit emissions from one or more key sectors (e.g. utilities, transport or heavy manufacturing).

--How permits are distributed. Permits could be given to existing emitters, given to others (who could then sell them back to existing emitters), auctioned, or some combination of the foregoing. If permits are auctioned, substantial revenues could be raised. (Options for using these revenues include tax cuts, deficit reduction and support for transitional or technology programs). If permits are given away, recipients would potentially receive a windfall.

These and related issues are discussed below.

A. Where the constraint is imposed.

Carbon dioxide from fossil fuel combustion currently accounts for about 85% of U.S. greenhouse gas emissions. A trading program could be implemented at various points in the energy market, including fuel import, fuel extraction, processing, refining, distribution, and secondary conversion (e.g., coal to electricity). These points could vary by sector. For example, an emissions trading program could focus on the point of final combustion for coal, but on refining for oil, or distribution for natural gas.

Possible programs are described below:

Primary Fuel Emissions Trading

The primary fuel producing sector extraction, processing, refining, and distribution has many levels where a permit program could be implemented. One option would be to require permits at the point of first sale (a permit is surrendered with the first inter- or intra- company transaction). Such a system would include transactions between a coal company and an electric utility, between a natural gas producer and its marketing arm, between a natural gas producer and a broker, or between an oil extraction company and its refinery operations. Fuel importers would also require permits to import fuel. This would capture the carbon from fuel consumed in the refining process. The number of market actors under this program design would be under 5000 and virtually all carbon in the energy sector would be included in the program.

Sectoral Emission Trading

An emissions trading program could also be applied at the point of combustion, allowing trading among affected sources. This system would be most comparable to the current SO₂ emissions allowance trading system.

Including the six largest industrial CO₂-emitting sectors (electric utilities, cement, primary metals, pulp and paper, petroleum refining and chemicals) in a trading program could encompass as many as 20,000 market participants and 90 percent of industrial CO₂ emissions. Mobile source emissions could be indirectly included in the system by allocating transportation equipment manufacturers permits for emissions associated with their automobile fleets or by including refiners in the program. Residential and commercial emissions could be similarly addressed by focusing upstream in the energy system. The electric generating sector could use existing monitoring and reporting infrastructure.

In determining where constraints would best be imposed, the following factors may be relevant:

Administrative and compliance feasibility: The number of sources involved in the trading program should be small enough to be administratively feasible and large enough to ensure market competition. In addition, monitoring and verification of permit compliance must be possible for those included in the program.

Public Acceptance: The program must consider the ease or difficulty with which various allocation approaches would be accepted by the public.

Potential to Diffuse Low Greenhouse Gas Technologies: Alternative points of intervention should be evaluated for their ability to provide incentives for research, development, adoption and diffusion of low greenhouse gas technologies.

Market Impacts: The permit program will have economic impacts on firms that vary depending on program design. For example, exempting certain sizes or categories of sources from permit

requirements because of administrative or equity concerns (e.g., small boilers or home heating oil) has competitive implications within the energy market.

Consistency with the international trading system: The domestic program should be consistent with any international prescriptions concerning the coverage of sources and gases.

2. Who gets permits

In an emissions trading system, permits can be given to existing emitters on the basis of baseline/historical emissions or other formulae, given to others (who can then sell them to emitters), auctioned (where revenues accrue to the government), or some combination of the foregoing.

Permit allocation formulae could take into account the market impacts of the mitigation program. Set asides could be made available to those industries, workers or consumers who experience a disproportionate share of the costs of control. A set aside could also be auctioned, with the revenues used for the same purpose.

Allocation Based On Baseline/Historical Emissions

Under this approach, sources are given a number of permits based on baseline fuel production or emissions and an allocation formula. Various allocation formulae can be devised, weighted to greater or lesser degrees in favor of sources with high historical emissions. Emissions allowances are endowed to facility operators for no cost and would be transferable. Those receiving permits thus obtain assets of potentially large value from the government at no cost.

Such an allocation mechanism could create entry barriers. In a capital intensive sector like primary fuel production, where entry barriers are already substantial, new entrants would be further disadvantaged if they had to purchase permits especially if existing holders hoard permits. This problem could be mitigated by setting aside a number of permits for purchase by new entrants or by auctioning a portion on the open market. Such an auction would also facilitate price discovery in a new market. Although new firms will still be disadvantaged (as they will pay for all of their permits), they would be able to enter the market. The pool of permits would need to be withheld from existing sources to ensure compliance with budgeted national emission levels.

It may be desirable to design an allocation that would allow credit for early emissions reductions (those achieved prior to the start of the program, but after the baseline period) -- in particular for those that reduced greenhouse gas emissions as part of government sponsored voluntary programs. If credits for past actions are given, the total credits allowed would need to be deducted from the overall permit allocation for the first budget period in order not to exceed the national greenhouse gas emissions target. In addition, mechanisms may be necessary to ensure verification of these credits.

Auction

Alternatively, an auction could be used to allocate permits. The price permit holders pay would depend in part on the auction design or method used. Auctions ensure that permits cannot be hoarded (a concern often expressed regarding allocation approaches), are available for trade, and would serve to inform potential traders about current price levels. Auctions would put new entrants on the same footing as existing emitters. As discussed earlier, since an auction could produce substantial revenues, some decision would have to be made with respect to what to do with the proceeds.

Given that an auction could produce substantial revenues, some decision would have to be made with respect to what to do with the proceeds. They could be used exclusively to reduce taxes or the deficit. Alternatively, as discussed below, a portion of the revenues could be used to address inequities in the distribution of control costs and to fund R&D for less carbon intensive energy sources and end uses.

Supporting Technological Progress and Transitions

The allocation of permits, or the use of auction revenue, could be used to promote more rapid diffusion of existing climate-friendly technologies and accelerated R&D for new technologies. For example, a reserve of allowances could be set aside to encourage more rapid development and diffusion of low greenhouse gas emitting technologies. Manufacturers of energy consuming equipment could compete for the set aside based on the degree to which they produce equipment more efficient than the average in use or than required by current mandatory efficiency standards. Such a program

could yield reductions in energy demand and help buffer the consumer from the impact of higher energy costs. Similar results could be achieved with the use of auction revenue.

Permit allocation formulae could take into account the market impacts of the mitigation program. Set asides could be made available to those industries, workers, or consumers who experience a disproportionate share of the costs of control. Auction revenues could also be used for this purpose.

C. Non-carbon greenhouse gases

Greenhouse gases include not only carbon dioxide, but also methane, nitrous oxides, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). Gases differ both in their atmospheric lifetimes and in their ability to trap heat in the atmosphere. In addition, carbon is not only emitted through the combustion of fossil fuels, but is also absorbed by sinks such as trees and soils.

Gases other than carbon dioxide account for the 15% of U.S. greenhouse gas emissions. Most important is methane, which accounts for 11% of national emissions. Since gases differ in their lifetimes and in their potential to trap heat in the atmosphere, an exchange rate or trading ratio must be established to convert all gases into common units for inclusion in a trading program. Such ratios have been developed by climate researchers and could be applied here. These should be consistent with the rules established in the international protocol.

Several, although not all, of the many sources of non-carbon greenhouse gases could likely be included in a trading system. For example, methane emitting coal mines, landfills, livestock manure management facilities and potentially natural gas distribution systems may meet the criteria described above for inclusion in a greenhouse gas trading program. These sources account for 7% of national greenhouse gas emissions. Similarly, emissions of some sources of other gases could potentially be included (e.g., magnesium production).

Forests in the United States currently remove an amount of carbon equal to 8% of national emissions from the atmosphere. Their inclusion in the trading program would enhance the system's flexibility, although there could be considerable methodological challenges with such an approach.

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THE ECONOMICS OF CLIMATE CHANGE

Testimony to the Committee on Environment
and Public Works, U.S. Senate

by

Dale W. Jorgenson

Professor of Economics, Harvard University

Mr. Chairman, distinguished members of the Committee on Environment and Public Works: I am very grateful for the opportunity to participate in these Hearings on the scientific understanding of global climate change. My testimony will focus on the economics of climate change. As a point of departure I will use the "Economists' Statement on Climate Change" included in my written testimony. I was one of five co-authors of this statement, which was circulated in January of this year and has now been endorsed by 2600 economists, including eight Nobel prize winners.

The first paragraph concludes that global change involves significant environmental risks and preventive steps are justified. The second paragraph summarizes economic studies showing that there are policies for reducing greenhouse gas emissions with benefits that outweigh the costs. The third paragraph describes these policies in more detail and emphasizes the importance of relying on market-based mechanisms.

The economics of climate change can usefully be divided into three parts. The first is determination of the overall objective of climate policy. The economists' approach to this problem is to choose a policy that produces the greatest margin of benefits over costs. Using economic jargon, I will refer to this as the "optimal" policy. Such a policy would stipulate a time path for future emissions of greenhouse gases that could be embodied in an international agreement.

After an overall objective is chosen, the second step is to devise a means of implementing this goal. Emissions of greenhouse gases would have to be allocated among the signatories of an agreement. In addition, emissions by countries that are not signatories would have to be taken into

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account, since the global climate is affected by total emissions. Third, given an allocation of greenhouse gas emissions among countries, each country would have to implement its emissions goal by devising policies that would hold emissions within the prescribed quota. Furthermore, the international community would have to monitor emissions for all countries.

Let me begin with an evaluation of our existing climate policy, the Climate Change Action Plan (CCAP) of 1993. This Plan consisted of voluntary actions projected to reduce emissions to 1990 levels by the year 2000. The goal was stipulated in the United Nations Framework Convention on Climate Change ratified by the United States in October 1993.

The impact of CCAP is summarized in the final chart, which compares a projection of U.S. emissions of greenhouse gases under the original CCAP "baseline," projecting emissions without the Plan. The CCAP actions were projected to reduce emissions to 1990 levels by the year 2000. The third line on the chart gives actual U.S. emissions through 1996. These are above the CCAP baseline and far above emissions levels required for stabilization. Clearly, we need to consider alternatives to our existing climate policy.

The starting point for a discussion of climate policy is the damages associated with a change in the climate. This is based on combining a physical description of the climate with an economic description of the world economy. This type of analysis is called "integrated assessment" and an assessment of this type has been carried out by William Nordhaus of Yale University in his 1994 book. The loss associated with climate change is 1.34 percent of world product in 2050.

How large are the damages associated with climate change? They are equivalent to the loss of about one year of world economic growth. Obviously, this is sizable, but not overwhelming. In the view of the signatories of the Economists' Statement on Climate change, this is sufficient to justify preventive steps to reduce greenhouse gas emissions.

Next, suppose we choose reductions in emissions that will produce the maximum difference between costs and benefits. How large are the benefits of this policy? Nordhaus has calculated the benefits for the world as a whole to be equivalent to \$271 billion dollars. This is only 0.04 percent of future consumption! While damages associated with climate change are substantial, steps to mitigate these damages will produce only very modest effects.

Let me emphasize at this point that the policy I have described conforms to the Economists' Statement on Climate Change. Preventive steps are justified. Policies like the one I have described would reduce greenhouse gas emissions and could employ market-based mechanisms to do so. A policy appropriate for international implementation would be the system of internationally tradeable permits described in the U.S. Climate Change Proposal of January 17.

For domestic implementation of the optimal climate change policy an appropriate market mechanism would be to impose taxes on greenhouse gas emissions. These taxes would be relatively modest, amounting to an initial tax of \$5.29 per ton of carbon and rising to \$10.03 per ton by the year 2025. My paper with Peter Wilcoxon, "The Economic Effects of a Carbon Tax," analyzes the effects of a tax on emissions of carbon dioxide, the most important greenhouse gas, in greater detail.

Wilcoxon and I calculate the cost of achieving various goals, including the stabilization goal of the United Nations Convention. We also consider different methods for "recycling" the revenues from a carbon tax and find that the economic cost is highly dependent on the use of the revenue. Finally, we consider the use of alternative tax instruments, such as a "Btu" tax on energy and an *ad valorem* tax on energy.

Our overall conclusions are, first, that a carbon tax is superior to other tax instruments. Second, by using the revenues to reduce the most burdensome taxes, namely taxes on income from capital, economic growth can be stimulated rather than retarded. Of course, reducing the tax burden on capital by substituting other forms of taxation would produce similar effects with no effect on emissions of greenhouse gases.

To sum up: The economics of climate change is well understood. The optimal policy, described in more detail in my written testimony, involves a modest reduction in the growth of greenhouse gas emissions. This should provide the basis for any international agreement that would supersede the United Nations Framework Convention of 1994. However, this involves smaller reductions than our existing climate policy, the U.S. Climate Change Action Plan.

The U.S. Climate Change Proposal from last January contains a useful contribution to international implementation by proposing a system of internationally tradeable permits for emissions. Domestic implementation requires a process for setting country-specific quotas for emissions. This might impose lower or higher reductions in emissions for the U.S., relative to other countries. After the U.S. quota has been determined, the final step would be to impose a tax on emissions like the carbon tax discussed in my paper with Wilcoxon.

**TESTIMONY TO THE
U.S. SENATE COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS**

**THE ECONOMICS OF
CLIMATE CHANGE**

by

Dale W. Jorgenson

Professor of Economics

Harvard University

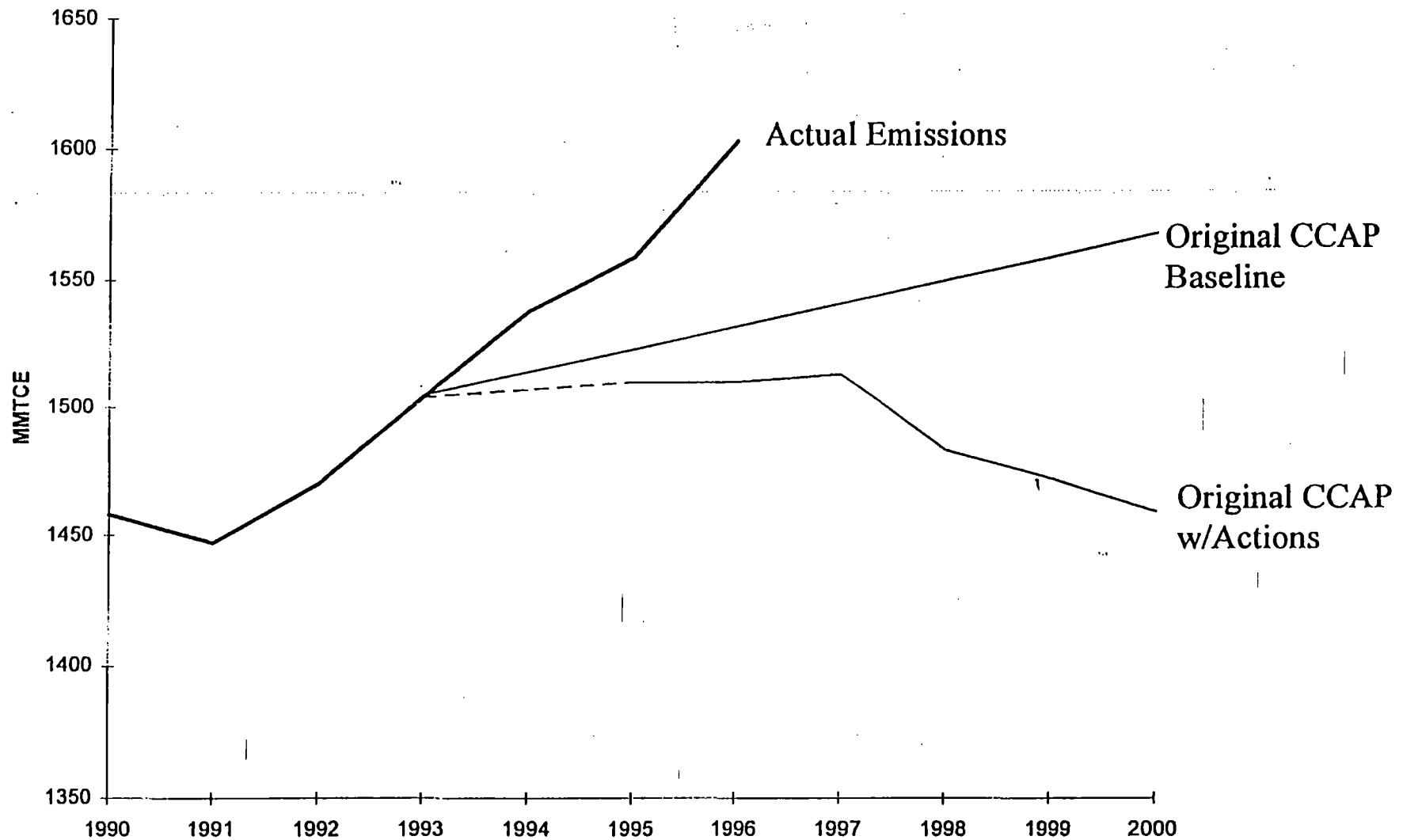
Thursday, July 10, 9:30 a.m.

Room 406

Dirksen Senate Office Building

Washington, D.C.

US Greenhouse Gas Emissions: Original CCAP Projections and Actual through 1996



SHORT READING LIST

William J. Clinton and Albert Gore, Jr.,
THE CLIMATE CHANGE ACTION PLAN,
Washington, Executive Office of the President,
October 1993.

Dale W. Jorgenson and Peter J. Wilcoxon,
"The Economic Effects of a Carbon Tax," in
Henry Lee (ed.), SHAPING NATIONAL
RESPONSES TO CLIMATE CHANGE, Wash-
ington, The Island Press, 1995, pp. 237-260.

William D. Nordhaus, "Analysis of Policies
to Slow Global Warming," Chapter 5 in
MANAGING THE GLOBAL COMMONS,
Cambridge, The MIT Press, 1994, pp. 77-100.

The World Bank, "International Environ-
mental Concerns," Chapter 8 in DEVELOP-
MENT AND THE ENVIRONMENT, New
York, Oxford University Press, 1992, pp. 153-
169.

WHAT IS THE PROBLEM?

GLOBAL CLIMATE AS A
COMMON PROPERTY RESOURCE

GLOBAL ECONOMIC DAMAGE:
1.34 PERCENT OF WORLD PRODUCT
IN THE YEAR 2050

THIS IS EQUIVALENT TO ONE
YEAR'S ECONOMIC GROWTH!

THE ECONOMIST'S POLICY RESPONSE

POLICY INSTRUMENT:
A WORLD CARBON TAX

AN OPTIMAL TRANSITION PATH
FOR SLOWING CLIMATE CHANGE

PRODUCES A BENEFIT OF
\$271 BILLION
U.S. DOLLARS OF 1989

PRACTICAL IMPLEMENTATION

INTERNATIONAL COORDINATION:
A POSSIBLE FRAMEWORK AGREEMENT

POLICY INSTRUMENT:
INTERNATIONALLY TRADEABLE PERMITS

DOMESTIC POLICIES:
NATIONAL CARBON TAXES

TWO ALTERNATIVE POLICIES

THE RIO EARTH SUMMIT:
STABILIZE THE CLIMATE

CLINTON-GORE ACTION PLAN:
STABILIZE EMISSIONS

A MORE LIMITED ECONOMIST'S ROLE:
MINIMIZING THE COST OF
ACHIEVING THESE OBJECTIVES

EVALUATING THE ALTERNATIVES

STABILIZING EMISSIONS

RESULTS IN AN ADDITIONAL COST OF

\$7.069 TRILLION
U.S. DOLLARS OF 1989

STABILIZING THE CLIMATE

ADDS A FURTHER COST OF

\$12.521 TRILLION
U.S. DOLLARS OF 1989

DOING NOTHING IS SUPERIOR TO
EITHER OF THESE ALTERNATIVES!

THE CLIMATE CHANGE ACTION PLAN

STABILIZING EMISSIONS AT
1990 LEVELS BY THE YEAR 2000

FIFTY ACTIONS INVOLVING
ALL SECTORS OF THE ECONOMY

NO TRADEABLE PERMITS;
NO ENERGY TAXES

- 9 -

A PRACTICAL BEGINNING

1. ELIMINATE SUBSIDIES TO
ENERGY CONSUMPTION
2. SUBSTITUTE ENERGY TAXES
FOR INCOME TAXES

ECONOMISTS' STATEMENT ON CLIMATE CHANGE

*Endorsed by Over 2000 Economists
including six Nobel Laureates*

I. The review conducted by a distinguished international panel of scientists under the auspices of the Intergovernmental Panel on Climate Change has determined that "the balance of evidence suggests a discernible human influence on global climate." As economists, we believe that global climate change carries with it significant environmental, economic, social, and geopolitical risks, and that preventive steps are justified.

II. Economic studies have found that there are many potential policies to reduce greenhouse-gas emissions for which the total benefits outweigh the total costs. For the United States in particular, sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run.

III. The most efficient approach to slowing climate change is through market-based policies. In order for the world to achieve its climatic objectives at minimum cost, a cooperative approach among nations is required—such as an international emissions trading agreement. The United States and other nations can most efficiently implement their climate policies through market mechanisms, such as carbon taxes or the auction of emissions permits. The revenues generated from such policies can effectively be used to reduce the deficit or to lower existing taxes.

Table 5.1
Net benefit of alternative policies on discounted consumption

Case	Policy	Discounted Value of Consumption			Impact on Annualized Value of Consumption (billions of \$/yr.)
		Base Value (trillions of 1989 U.S.\$)	Impact of Program: Difference (billions of \$)	Percent Difference	
1	No mitigation	730.90	0	0.00	0
2	Optimum	731.17	271	0.04	11
3	10-year delay	731.14	243	0.03	10
4	Stabilize emissions at 1990 level	723.83	(7,069)	(0.98)	(283)
5	Stabilize emissions at 80 percent of 1990 level	718.38	(12,521)	(1.74)	(501)
6	Geoengineering	736.50	5,601	0.76	224
7	Stabilize climate at maximum of 1.5 degrees C increase	689.92	(40,980)	(5.94)	(1,639)

Notes: The present value of consumption is calculated as the consumption stream from 1990 on discounted to 1990 at the rate of interest on goods and services calculated in the optimal program. Values in parentheses indicate negative values. All values are in 1989 U.S. dollars. Annualized consumption is calculated at rate of interest less rate of growth (equal to .04) times discounted value of consumption.

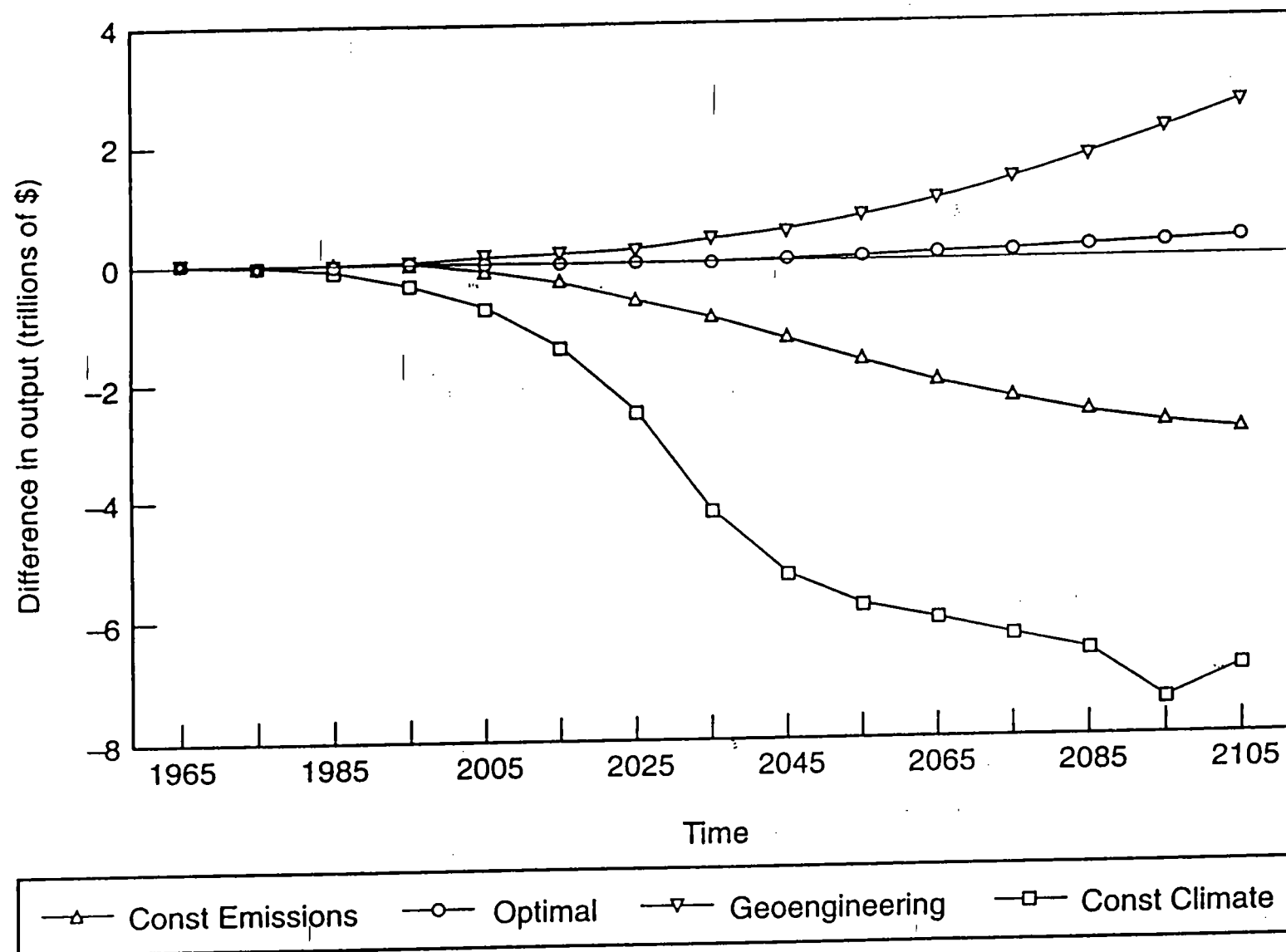


Figure 5.1
Differences in global output
(Difference from no-controls baseline, trillions 1989 U.S. dollars)

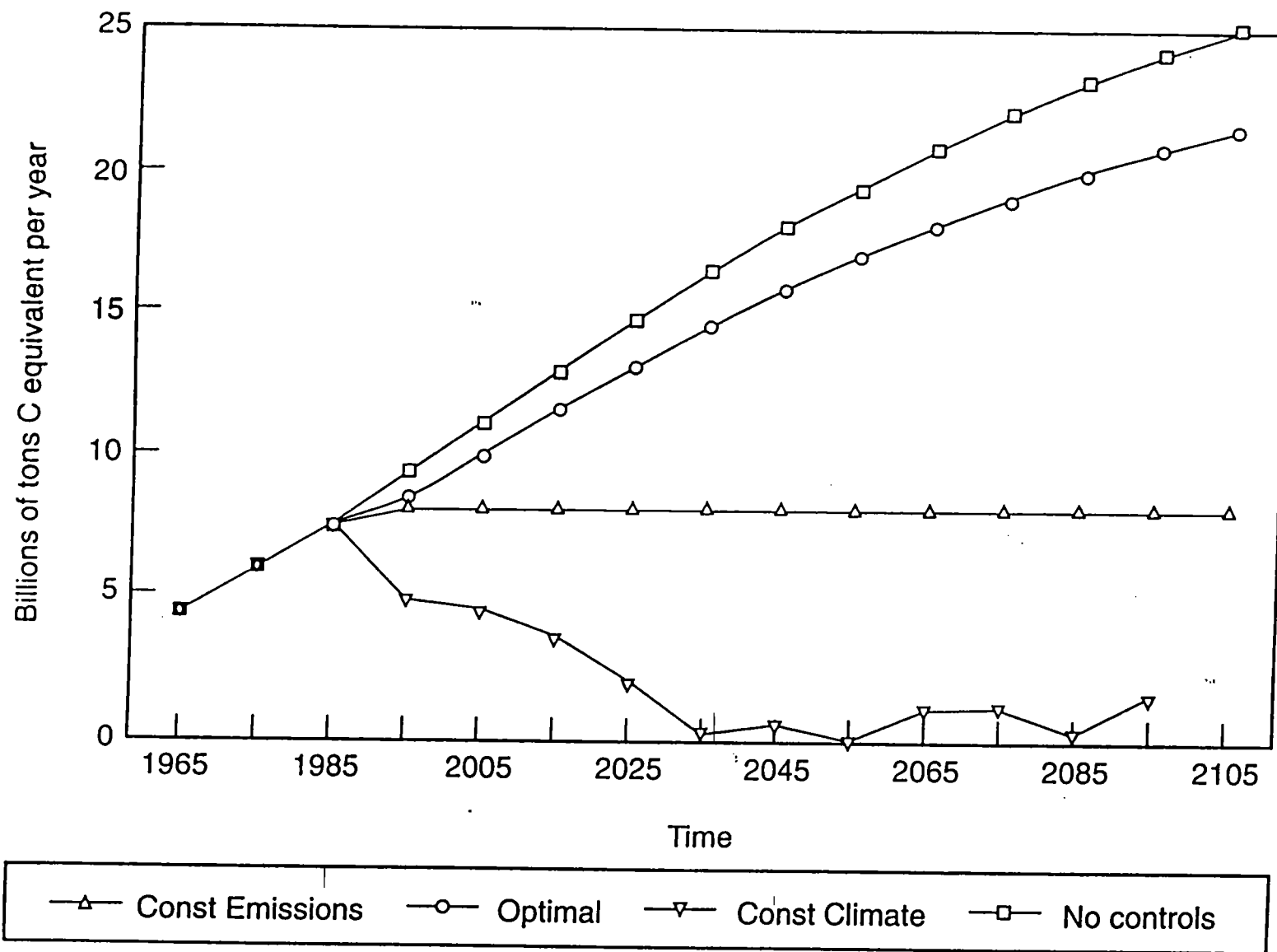


Figure 5.2
Greenhouse-gas emissions
(CO₂ and CFCs only)

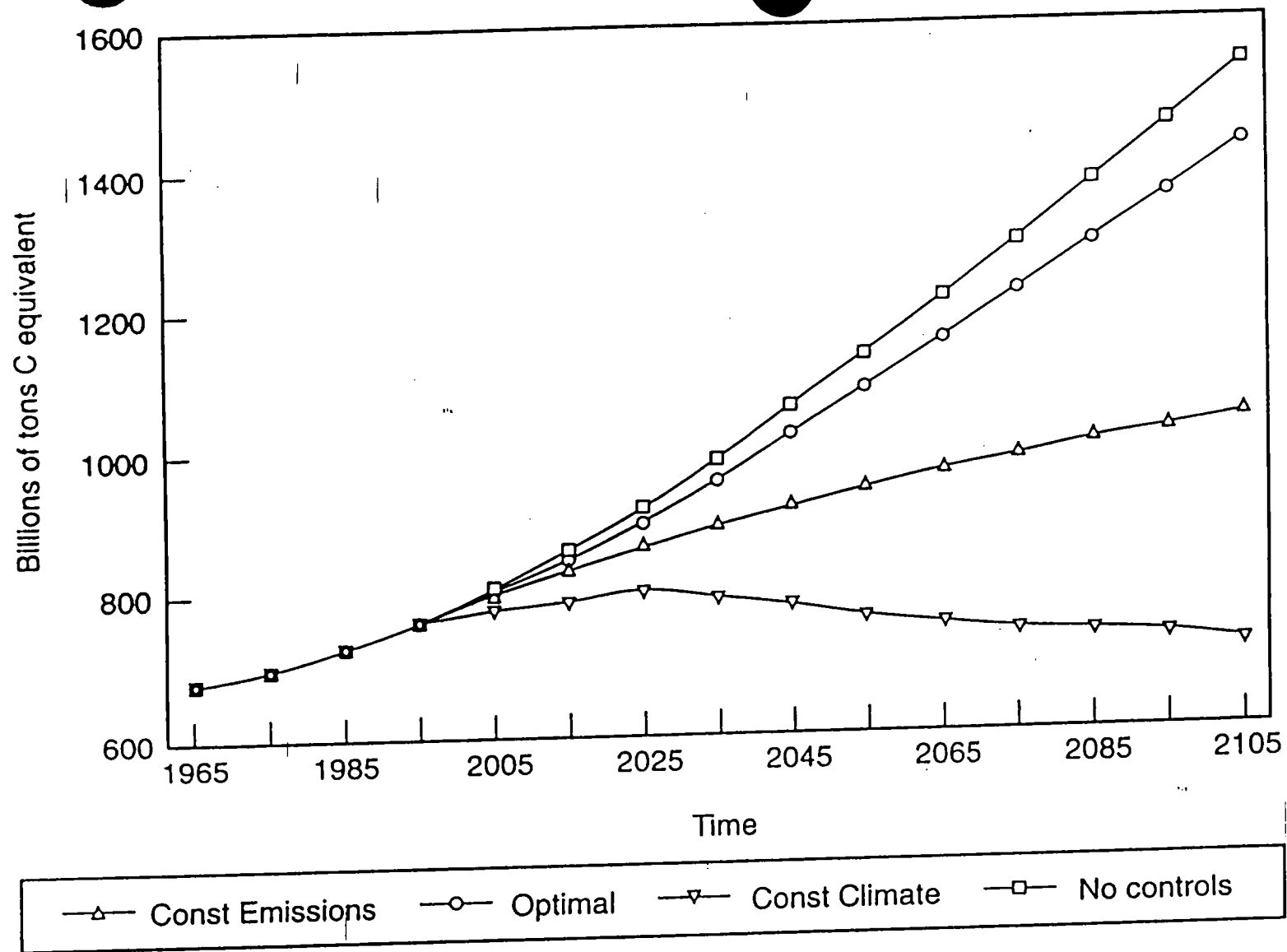


Figure 5.3
Atmospheric GHG concentrations
(CO₂ and CFCs only)

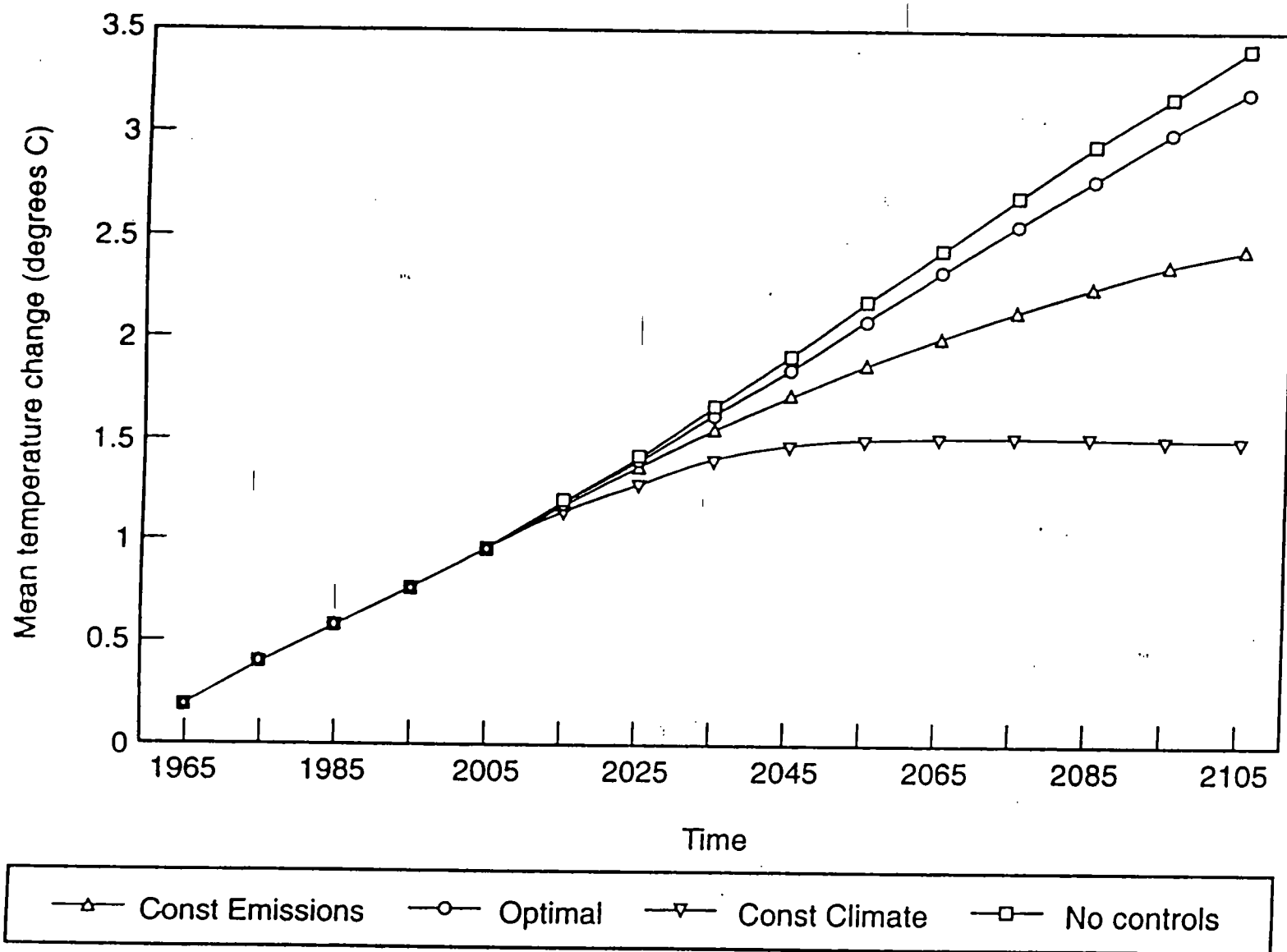


Figure 5.4
Global mean temperature
(Change from 1865)

Table 8.1 Effects of eliminating subsidies on commercial energy in Eastern Europe and the former U.S.S.R. and in developing countries

<i>Effect</i>	<i>Eastern Europe and former U.S.S.R.</i>	<i>Developing countries</i>
<i>Reduction in emissions, 1995</i>		
Amount (millions of tons of carbon)	446	234
As share of projected regional emissions (percent)	29	11
As share of projected global emissions (percent)	7	4
<i>Cumulative reduction, 1991-2000</i>		
Amount (millions of tons of carbon)	3,796	2,318
As share of projected cumulative regional emissions (percent)	24	11
As share of projected cumulative global emissions (percent)	6	4

Note: The base case is derived from World Bank projections of energy demand. In this scenario, worldwide carbon dioxide emissions increase by about 20 percent between 1990 and 2000.

Sources: World Bank staff estimates using Bates and Moore, background paper; Imran and Barnes 1990; Marland and others 1989; Hughes 1991.

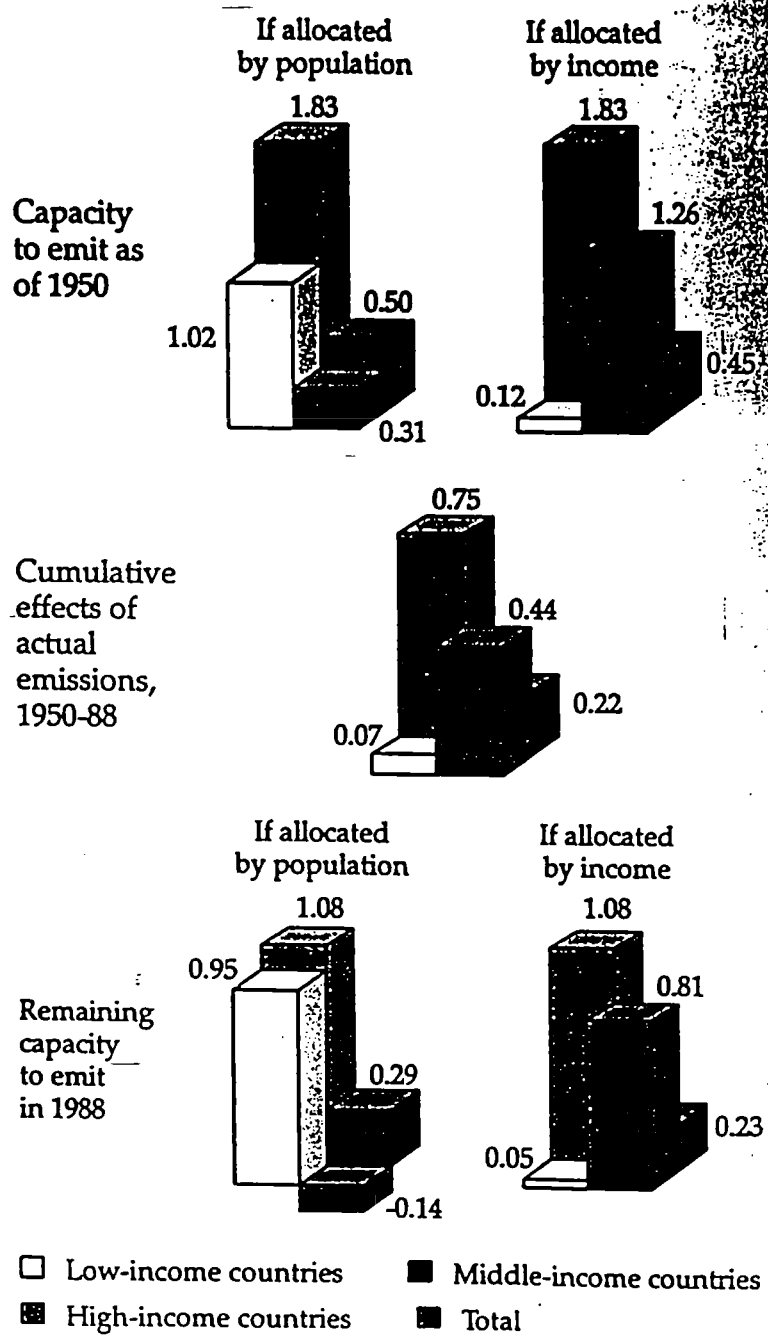
its made long ago, e them stick. Some isure that countries strategy.

way that targets for as important impli- t emissions allocate mospheric carrying uniform percentage l implicitly allocate nt emissions, favor- ons, whose per cap- nple, the per capita e United States are na. If the approach d right to the atmo- rights to future use to population. An- s according to some OP. That would pro- equity. Any alloca- at to take some ssions, since green- go continue to con-

for allocating atmo- like? Figure 8.2 as- purposes, that the gases is stabilized at e preindustrial level here. It then shows ount of atmospheric red. ing to population with substantial cas- es, while the high- a net deficit equiva- at they emitted in the cumulative past exceed their fu- e carrying capacity; t to emit. ing to income, which the potential to emit

facilitate allocating rights by population rather than income

Figure 8.2 Scenarios for allocating capacity to emit carbon dioxide if greenhouse gas warming effect is stabilized at $2\times\text{CO}_2$ (warming effect of emissions in watts per square meter)



Note: For illustrative purposes, it is assumed that the greenhouse gas warming effect is stabilized at the equivalent of double preindustrial carbon dioxide concentrations ($2\times\text{CO}_2$). Actual emissions exclude deforestation due to lack of reliable data. 1950 is used as the starting point because the data series on emissions from fossil fuels and cement manufacturing begins in that year.

PREFACE

Last year in Rio de Janeiro, Brazil, world leaders and citizens from more than 200 countries came together to confront the global ecological crisis. The Earth Summit aroused the hopes and dreams of people around the world and set in motion ambitious plans to address the planet's deepest environmental threats. We shared a common mission: to provide a higher quality of life for ourselves and a brighter future for our children.

At the Earth Summit, the United States joined other countries in signing the Framework Convention on Climate Change, an international agreement to address the danger of global climate change. The Convention has been signed by 161 countries and has been ratified by 31 of those countries. The objective of the Convention was stated to:

"...achieve ... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."

The international community rallied around the threat of climate change because scientists agree that the risk is real. There is no doubt that human activities are increasing the atmospheric concentrations of greenhouse gases, especially carbon dioxide, methane, and nitrous oxide. All

EXECUTIVE SUMMARY

We must take the lead in addressing the challenge of global warming that could make our planet and its climate less hospitable and more hostile to human life. Today, I reaffirm my personal, and announce our nation's commitment to reducing our emissions of greenhouse gases to their 1990 levels by the year 2000. I am instructing my administration to produce a cost-effective plan ... that can continue the trend of reduced emissions. This must be a clarion call, not for more bureaucracy or regulation or unnecessary costs, but instead for American ingenuity and creativity, to produce the best and most energy-efficient technology.

President Clinton
April 21, 1993

President Clinton's Climate Change Action Plan meets the twin challenges of responding to the threat of global warming and strengthening the economy. Returning U.S. greenhouse gas emissions to their 1990 levels by the year 2000 is an ambitious but achievable goal that can be attained while enhancing prospects for economic growth and job creation, and positioning our country to compete and win in the global market.

There is no doubt that human activity is increasing the concentration of greenhouse gases in the atmosphere. The buildup of greenhouse gases threatens to change the global climate system raise sea levels and inundate coastal areas, inflict irreversible damage to ecosystems, and